PROPOSED 750MW COMBINED CYCLE GAS TURBINE POWER PLANT IN RICHARDS BAY, CITY OF UMHLATHUZE LOCAL MUNICIPALITY, KING CETSHWAYO DISTRICT MUNICIPALITY, KWAZULU-NATAL

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

DFFE REFERENCE NO.: 14/12/16/3/3/2/2799

FINAL

SEPTEMBER 2026

APPLICANT: MABASA ENERGY AND FUELS (PTY) LTD



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TITLE AND APPROVAL PAGE

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EXECUTIVE SUMMARY

A. PURPOSE OF THIS DOCUMENT

Nemai Consulting was appointed by Mabasa Energy and Fuels (Pty) Ltd (the "Applicant"), to conduct the Scoping and Environmental Impact Reporting (S&EIR) process for the proposed 750MW Combined Cycle Gas Turbine Power Plant in Richards Bay, City of uMhlathuze (CoU) Local Municipality, King Cetshwayo District Municipality (KCDM), KwaZulu-Natal (KZN) (the "Project").

This document serves as the final Environmental Impact Assessment (EIA) Report for the proposed Project.

B. PROJECT BACKGROUND AND MOTIVATION

Following the promulgation of the Integrated Resource Plan (IRP) in 2019, the then Minister of Mineral Resources and Energy determined that the procurement of new generation capacity is required to ensure energy security and that approximately 3 000 megawatts (MW) would be procured, to be generated from gas. The Gas Independent Power Producers Procurement Programme (GASIPPPP) was identified by the former Department of Mineral Resources and Energy (DMRE), which is now known as the Department of Mineral and Petroleum Resources (DMPR), as the appropriate programme to procure the new generation capacity.

The Applicant intends to bid for the GASIPPPP and/or other suitable energy markets and has proposed the development of a 750MW Combined Cycle Gas Turbine (CCGT) Power Plant (the "Plant") in Richards Bay, which falls within the CoU. The Project is located within Phase 1F of the Richards Bay Industrial Development Zone (RBIDZ) under a long-term lease agreement. The RBIDZ, which is a Special Economic Zone (SEZ), is a purpose-built and secured industrial estate linked to the Port of Richards Bay (PoRB) which aims to attract local and foreign direct investment.

C. PROJECT LOCATION

The project site is located in Alton North within Ward 2 of the CoU, approximately 1.5 km from the Richards Bay Central Business District (CBD) (see map below).

The earmarked site is located on Erf 16673 in Phase 1F of the RBIDZ, which is approximately 12.7 ha in extent. The current zoning of the site is "Noxious Industry".

The access point to the industrial complex is via Alumina Allee Road, which runs along the eastern boundary of the site. The coordinates of the approximate centre point of the site are 28°44'44.2202"S 32°1'52.938"E.

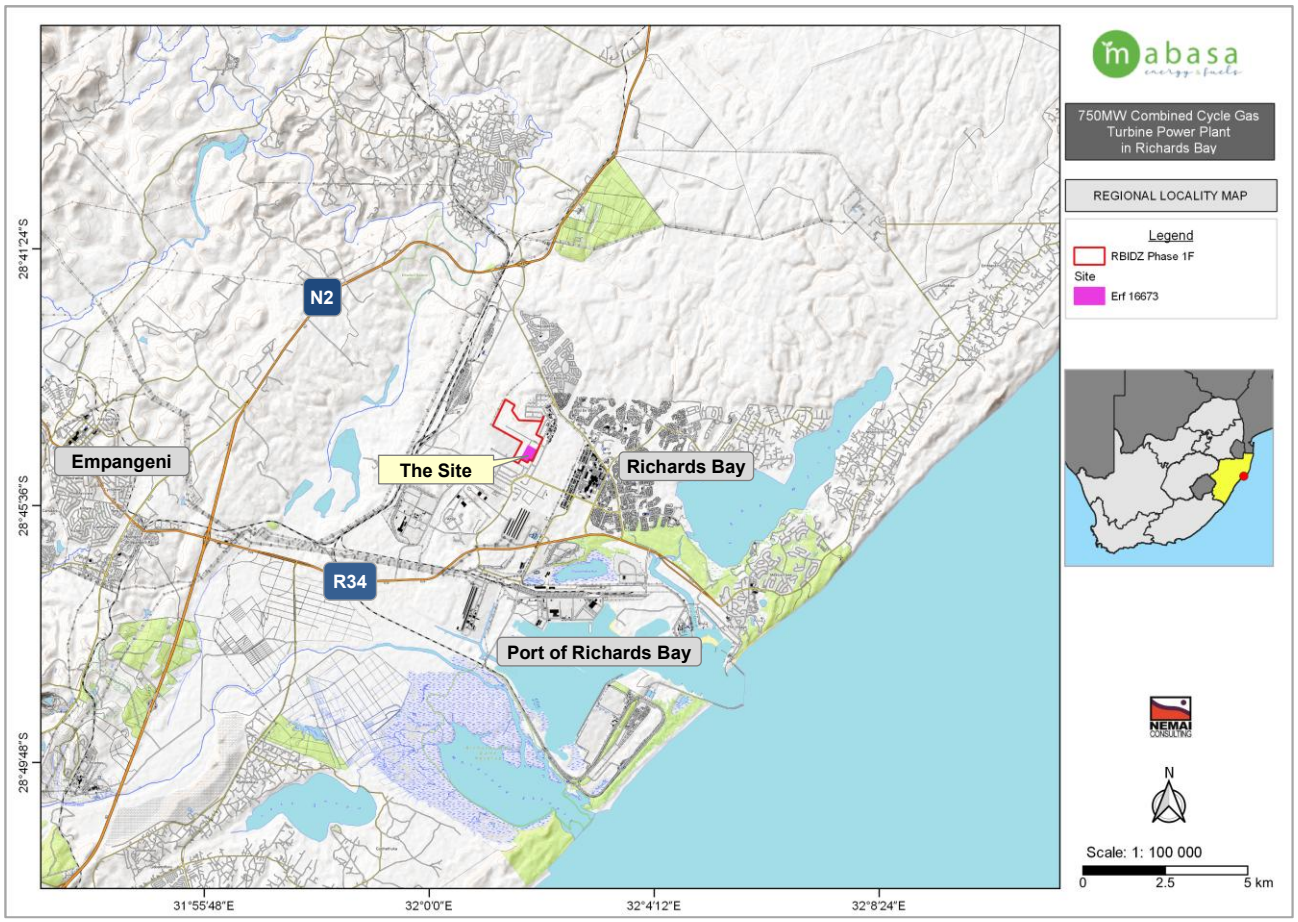


Figure A: Regional Locality Map

D. LEGISLATION AND GUIDELINES CONSIDERED

Pertinent legislation that has possible bearing on the Project from an environmental perspective is briefly discussed in the EIA Report.

The relationship between the Project and the following key pieces of environmental legislation is also explained:

- National Environmental Management Act (Act No. 107 of 1998);
- National Water Act (Act No. 36 of 1998);
- National Environmental Management: Waste Act (Act No. 59 of 2008);
- National Environmental Management: Air Quality Act (Act No. 39 of 2004);
- National Environmental Management: Biodiversity Act (Act No. 10 of 2004); and
- National Heritage Resources Act (Act No. 25 of 1999).

E. SCOPING AND ENVIRONMENTAL IMPACT REPORTING PROCESS

The process for seeking Environmental Authorisation (EA) for the Project under the National Environmental Management Act (Act No. 107 of 1998) (NEMA) is being undertaken in accordance with the EIA Regulations of 2014 (as amended). According to Government Notice (GN) 779 of 1 July 2016, the Minister of Environmental Affairs is the Competent Authority for the consideration and

processing of environmental authorisations and amendments thereto for activities related to the IRP 2010-2030. Hence, the application for EA was submitted to the Department of Forestry, Fisheries and the Environment (DFFE).

Based on the types of activities involved the requisite environmental assessment for the Project is a S&EIR Process. An outline of the process follows.

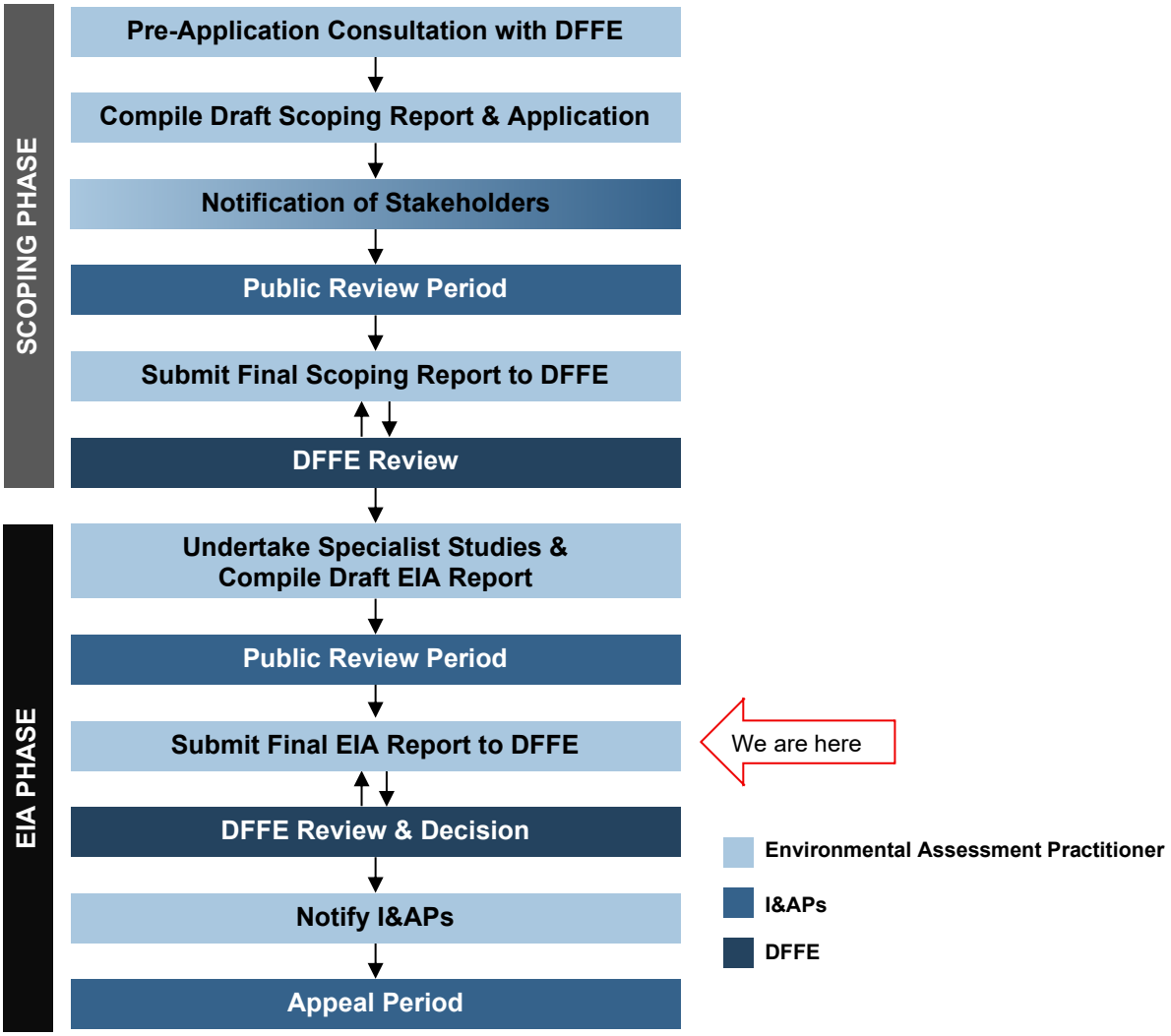


Figure B: Outline of S&EIR Process

F. PROJECT DESCRIPTION

The Combined Cycle Power Plant (CCPP) Module will consist of a circa 750 MW Power Block. It will consist of two (2) Gas Turbines each having capacity of 250 to 300 MW along with Electrical Generators, two (2) Heat Recovery Steam Generators (HRSGs) and one (1) Steam Turbine Generator (STG) having capacity of 250 to 300 MW. The CCPP is based on the latest state of the art heavy duty industrial type Class F Gas Turbines, which are suitable for base load and mid merit operation in both simple (open) cycle and combined cycle mode.

In order to provide natural gas importation infrastructure, the Transnet National Ports Authority (TNPA) is proposing to build a Liquefied Natural Gas (LNG) Terminal in the PoRB, namely the

Zululand Energy Terminal (ZET). The Applicant will source the supply and delivery of natural gas from this planned terminal development at the PoRB. The natural gas is expected to be supplied through a pipeline from the Transnet natural gas terminal to the Plant. The gas turbines are also capable of operating on a liquid fuel in the event of the loss of Natural Gas supply.

A summary of the Project is provided in the table to follow.

Table A: Project Summary

Component	Description / Dimensions
Location of the Site	Erf 16673 in Phase 1F of the RBIDZ.
Landowner	The land is owned by RBIDZ. The premises is leased under a long-term agreement.
Municipal Jurisdiction	KCDM (district) and CoU (local)
Electricity Generating Capacity	The Plant will be designed for base load operations at 500MW in Simple Cycle and 750MW in Combined Cycle.
Proposed Technology	The CCGT power plant will utilise a gas turbine generator to generate electricity using natural gas as fuel. The waste heat is used to generate steam to produce additional electricity via a steam turbine. The gas turbine operates on the Brayton Cycle, wherein the ambient air is first filtered, then compressed. In the combustor, the compressed air is heated by combustion of natural gas fuel. The high pressure-high temperature gas from the combustor is expanded in the turbine section and the remaining pressure drives the gas through the HRSG and stack. The heat from the exhaust gas is recovered in the HRSG to generate high pressure-high temperature steam, which in turn is expanded in the steam turbine and condensed to water in the condenser. The condensate from the condenser is pumped back to the HRSG. This steam-water cycle connected to the HRSG operates on the Rankine Cycle. After passing through the HRSG, the flue gas will be exhausted to the atmosphere through the main stack. The proposed Plant will employ the most recently developed CCGT technology.
Extent of the Property	Approximately 12.7 Ha.
Extent of the Proposed Plant	Approximately 12.2 Ha.
Stack Dimensions	The Plant needs to maintain a minimum 30 m of stack height with a diameter of approximately 6.9 m for the bypass stack and 60 m with a diameter of approximately 6.3m for the HRSG stack.
Elevation of Site	Elevations for the site area range from 40 to 43 m above mean sea level
Fuel Type for Plant	LNG, potentially backed up by diesel for short periods of gas interruption.
Site Access	The access point to RBIDZ Phase 1F is via Alumina Allee Road. The site within the industrial estate is accessed via an existing tarred road (external to the leased premises).
Water Requirements	**Construction phase**: Water for construction purposes will be directly sourced from the water available at the boundary of the site within the RBIDZ Phase 1F.
	Operational phase: The Plant's water requirements are (water-cooled case): • Potable water for domestic use: 6,000 ℓ/d • Demineralised water for HRSG and other: 256,000 ℓ/d • Service water requirement: 48,000 ℓ/d • Possible cooling water makeup: 21,000,000 ℓ/d Allowing for water treatment losses, this water requirement can be met by: • Potable water: 415,000 ℓ/d • Bulk clarified water: 21,000,000 ℓ/d if the water-cooled option is selected

Component	Description / Dimensions
	Water for operational purposes will be sourced from uMngeni-uThukela Water (UUW).
Associated Infrastructure	▪ Construction camp and laydown area ▪ Workshop ▪ Main Office ▪ Control Building ▪ Warehouse ▪ Fire water pump house ▪ Maintenance facilities ▪ Storage facilities ▪ Ablution facilities ▪ Guard house ▪ Fencing and gates ▪ Waste management facilities
Bulk Services Required	The following bulk services will be supplied by RBIDZ Phase 1F: ▪ Potable water ▪ Bulk clarified water ▪ Sewage ▪ Stormwater ▪ Roads ▪ Electricity External services will be required for: ▪ Waste oil sludge removal; ▪ Water treatment sludge removal General waste during the operational phase will form part of the municipal waste stream.

The application excludes the natural gas pipeline and grid connection associated with the proposed development.

G. ANALYSIS OF ALTERNATIVES

Various alternatives were considered for the proposed 750 MW CCGT Power Plant to determine the most suitable means of achieving the Project's objectives.

The following alternatives to the Project were considered and are discussed in the EIA Report:

- ❑ Energy generation;
- ❑ Location;
- ❑ Fuel type;
- ❑ Project size;
- ❑ Turbine technology;
- ❑ HRSG and STG technology;
- ❑ Cooling technology; and
- ❑ Do nothing / no-go option.

It was concluded that a natural gas-fired CCGT facility within Phase 1F of the RBIDZ represents the preferred alternative, as it provides efficient and reliable electricity generation while utilising land specifically designated for industrial development. The selected technologies maximise energy efficiency, reduce fuel consumption and emissions relative to conventional fossil-fuel generation technologies, and are compatible with the infrastructure and services available within the RBIDZ.

H. PROFILE OF THE RECEIVING ENVIRONMENT

The EIA Report provides a general description of the status quo of the receiving environment in the project area. This serves to provide the context within which the EIA was conducted. It also allows for an appreciation of sensitive environmental features and possible receptors of the effects of the proposed Project.

The receiving environment is explained in terms of the following features:

- Land use
- Land cover
- Climate
- Geology and Soil
- Hydrogeology
- Topography
- Surface Water
- Estuarine Environment
- Terrestrial Biodiversity
- Socio-Economic Environment
- Air quality
- Visual Quality
- Noise and Vibration
- Agriculture
- Planning
- Waste
- Transportation
- Heritage and Palaeontology
- Existing Structures and Infrastructure
- Health

I. SPECIALIST STUDIES

The following studies were undertaken for the Project, based on the outcomes of the Scoping exercise and Screening:

- Climate Change Impact Assessment;
- Air Quality Impact Assessment;
- Freshwater Ecosystem Assessment;
- Terrestrial Biodiversity Assessment;
- Floral (Plant Species) Assessment;
- Faunal (Animal Species) Assessment;
- Visual Resource Compliance Statement;
- Hydrology Assessment;
- Noise Impact Assessment;
- Geotechnical Assessment;
- Desktop Palaeontology Impact Assessment;
- Agricultural Agro-Ecosystem Assessment;
- Health Impact Assessment;
- Socio-Economic Impact Assessment;
- Social Impact Assessment; and
- Quantitative Risk Assessment.

A Traffic Impact Assessment was also undertaken for the broader Phase 1F development of the RBIDZ.

The information obtained from the respective specialist studies was incorporated into the EIA Report in the following manner:

- The assumptions and limitations identified in each study were included;
- The information was used to complete the description of the receiving environment in a more detailed and site-specific manner;
- A summary of each specialist study is provided, focusing on the approach to each study, key findings and conclusions drawn;
- The specialists' impacts assessments, and the identified mitigation measures, were included in the overall project impact assessment;
- Specialist input was obtained to address comments made by Interested and Affected Parties (I&APs) that related to specific environmental features pertaining to each specialist discipline; and
- Salient recommendations made by the specialists were taken forward to the final EIA Conclusions.

Collectively, the studies concluded that no fatal flaws were identified that would preclude the development, provided that recommended mitigation and management measures are implemented.

J. IMPACT ASSESSMENT

The EIA Report assessed the pertinent environmental impacts that could potentially be caused during the pre-construction, construction and operational phases of the Project.

Potential impacts were identified as follows:

- Impacts associated with listed activities contained in the EIA Regulations' Listing Notices;
- Impacts identified during the Scoping phase;
- An appraisal of the Project's activities and proposed infrastructure;
- An assessment of the receiving biophysical, social, economic and built environments;
- Findings from specialist studies;
- Issues highlighted by environmental authorities; and
- Comments received during public participation from I&APs.

The criteria used to assess the potential environmental impacts associated with the Project included the extent, magnitude, duration, probability and significance. Suitable measures were identified to manage the identified environmental risks and impacts according to the mitigation hierarchy. The proposed mitigation of the impacts associated with the Project includes specific measures identified by the technical team (including engineering solutions) and environmental specialists, stipulations of environmental authorities and environmental best practices. The impact assessment considered the significance ratings before and after mitigation and also determined the residual impacts.

The assessment identified a number of potentially significant environmental impacts associated with the proposed development. However, based on the findings of the specialist studies, these impacts are not considered to be fatal flaws. While certain impacts, such as greenhouse gas emissions, cumulative air quality effects, and risks associated with hazardous materials, may be significant if

unmanaged, these can be reduced to acceptable levels through engineering design controls, environmental management measures, monitoring programmes and compliance with applicable legislation and standards.

The assessment further considered cumulative impacts within the Richards Bay area, recognising the existing concentration of industrial and infrastructure developments. Although some cumulative environmental pressures may occur, the Project is considered compatible with the planned industrial land use of the RBIDZ and can be accommodated within the receiving environment, provided that mitigation measures are effectively implemented. While certain cumulative impacts, particularly those related to atmospheric emissions and climate change, will remain as residual impacts that cannot be entirely avoided, these impacts were not considered by the specialists to be of a magnitude that would preclude development of the Project.

The implications of the “no-go option” were also assessed. The “no go option” was considered in light of the motivation for the Project. The “no-go option” would avoid the environmental impacts associated with the Project but would also result in the loss of anticipated socio-economic benefits and additional electricity generation capacity.

The Environmental Management Programme (EMPr) that accompanies this EIA Report provides a comprehensive list of mitigation measures for specific elements of the Project and the receiving environment. The content of the EMPr is based on Appendix 4 of the EIA Regulations of 2014, as amended.

K. PUBLIC PARTICIPATION

The EIA Report provides the details of the following tasks that form part of the public participation process:

- Public participation completed during the Scoping Phase.
- Public Participation during the EIA Phase –
  - Maintenance of the stakeholders’ database;
  - Review period for the draft EIA Report;
  - Notification of review of the draft EIA Report;
  - Means of accessing the draft EIA Report;
  - Addressing comments received on the draft EIA Report; and
  - Public meetings to present the draft EIA Report.

The figure to follow outlines the public participation process for the Scoping Phase (completed) and EIA Phase (current).

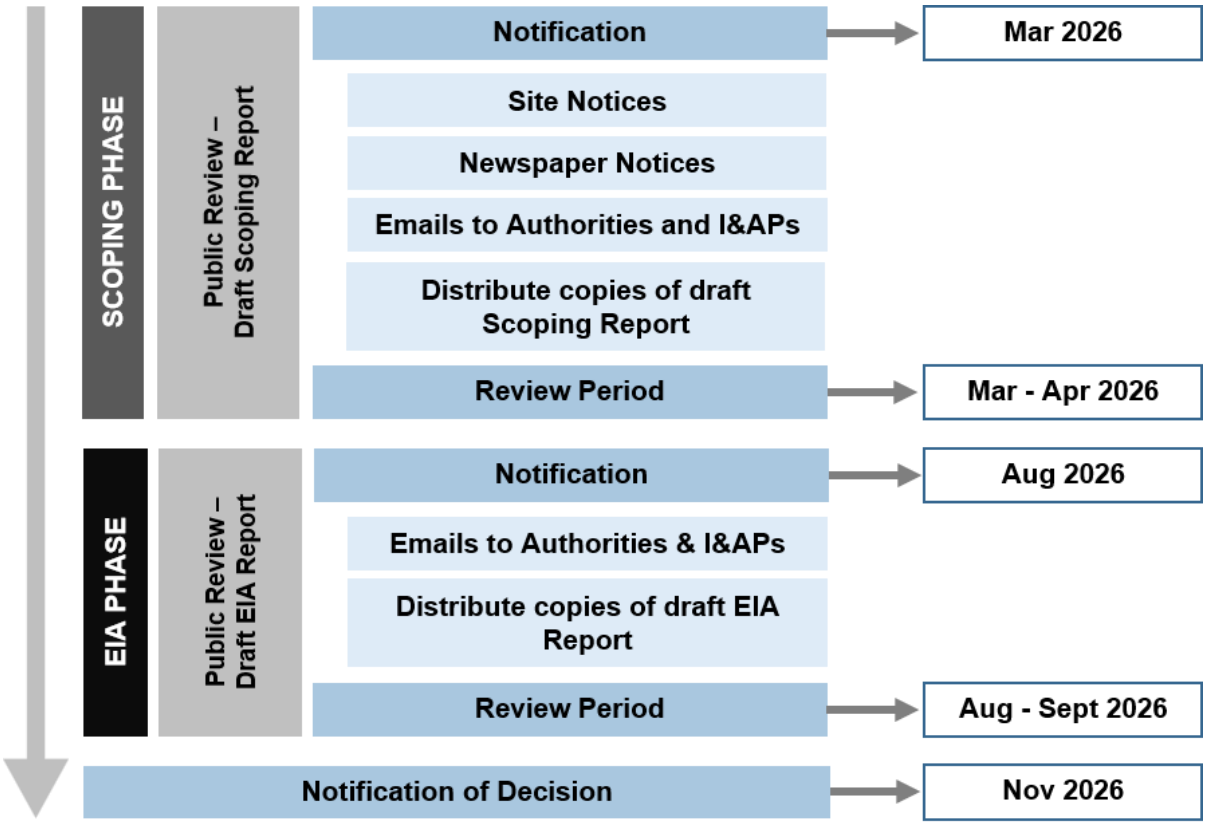


Figure C: Outline of Public Participation Process

L. CONCLUSIONS AND RECOMMENDATIONS

The following key tasks were undertaken during the EIA phase for the proposed Project:

- The specialist studies identified in the Plan of Study for the EIA were undertaken and the findings were incorporated into the EIA Report in terms of understanding the environmental status quo and sensitive features, assessing the potential impacts and establishing concomitant mitigation measures;
- Potentially significant impacts pertaining to the pre-construction, construction and operational phases of the Project were identified and assessed, and mitigation measures were provided; and
- Alternatives for achieving the objectives of the proposed activity were considered, and the preferred options were identified.

Attention is drawn to specific sensitive environmental features for which mitigation measures are included in the EIA Report and EMPr. A combined sensitivity map in terms of freshwater ecosystems and terrestrial biodiversity is also shown.

An Environmental Impact Statement is also provided and key recommendations are put forward that may also influence the conditions of the Environmental Authorisation (if granted).

Based on the findings of the specialist studies and the outcomes of the EIA, it is concluded that Environmental Authorisation may be granted for the Project, provided that all identified

environmental management measures are implemented and complied with. It is further the opinion of the Environmental Assessment Practitioner (EAP) and environmental team that the EIA was executed in an objective manner and that the process and EIA Report conform to the requirements stipulated in the EIA Regulations of 2014, as amended.

ISIFINYEZO ESIPHEZULU

This isiZulu summary has been prepared to assist the public in understanding the Draft EIA Report. The full technical assessment is contained in the Draft EIA Report and its specialist appendices. In the event of uncertainty, the English EIA Report should be consulted as the complete technical record.

A. INHLOSO YALO MBHALO

I-Nemai Consulting yaqokwa abakwaMabasa Energy and Fuels (Pty) Ltd ("uMfakisicelo"), ukuba yenze ukuhlolwa kombiko womthelela obakhona kuyo imvelo (Environmental Impact Assessment) (EIA) kuMasipala weNdawo ohlongozwayo we-750MW Combined Cycle Gas Turbine (CCGT) Power Plant eRichards Bay, eDolobheni laseMhlathuze (CoU) uMasipala wendawo, uMasipala wesifunda iKing Cetshwayo (KCDM), Kwazulu-Natal (KZN) ("iPhrojekthi").

Lo mbhalo usebenza njengombiko wokugcina Wokuhlolwa Komthelela Kwezemvelo (EIA) wale Phrojekthi ehlongozwayo.

B. ISENDLALELA KANYE NESISUSA SEPHROJEKTHI

Ngemuva kokumenyezelwa koHlelo Lwezinsiza Ezihlanganisiwe (i-IRP) ngo-2019, owayenguNgqongqoshe Wezimbiwa Namandla wanquma ukuthi ukuthengwa kwamandla okukhiqiza okusha kuyadingeka ukuqinisekisa ukuphepha kokukhiqizwa kwamandla nokuthi cishe amamegawathi angaba ngu-3000 (MW) ayezotholwa, ukuze akhiqizwe ngegesi yemvelo (natural gas). Uhlelo lwe-Gas Independent Power Producers Procurement Programme (GASIPPPP) lwabonwa nguMnyango Wezimbiwa Namandla (i-DMRE) eseyaziwa njengomnyawo ngezimbiwa kanye nezinsiza zikaphethiloli (Department of Mineral and Petroleum Resources) njengohlelo olufanelekela ukuthenga amandla okukhiqiza okusha.

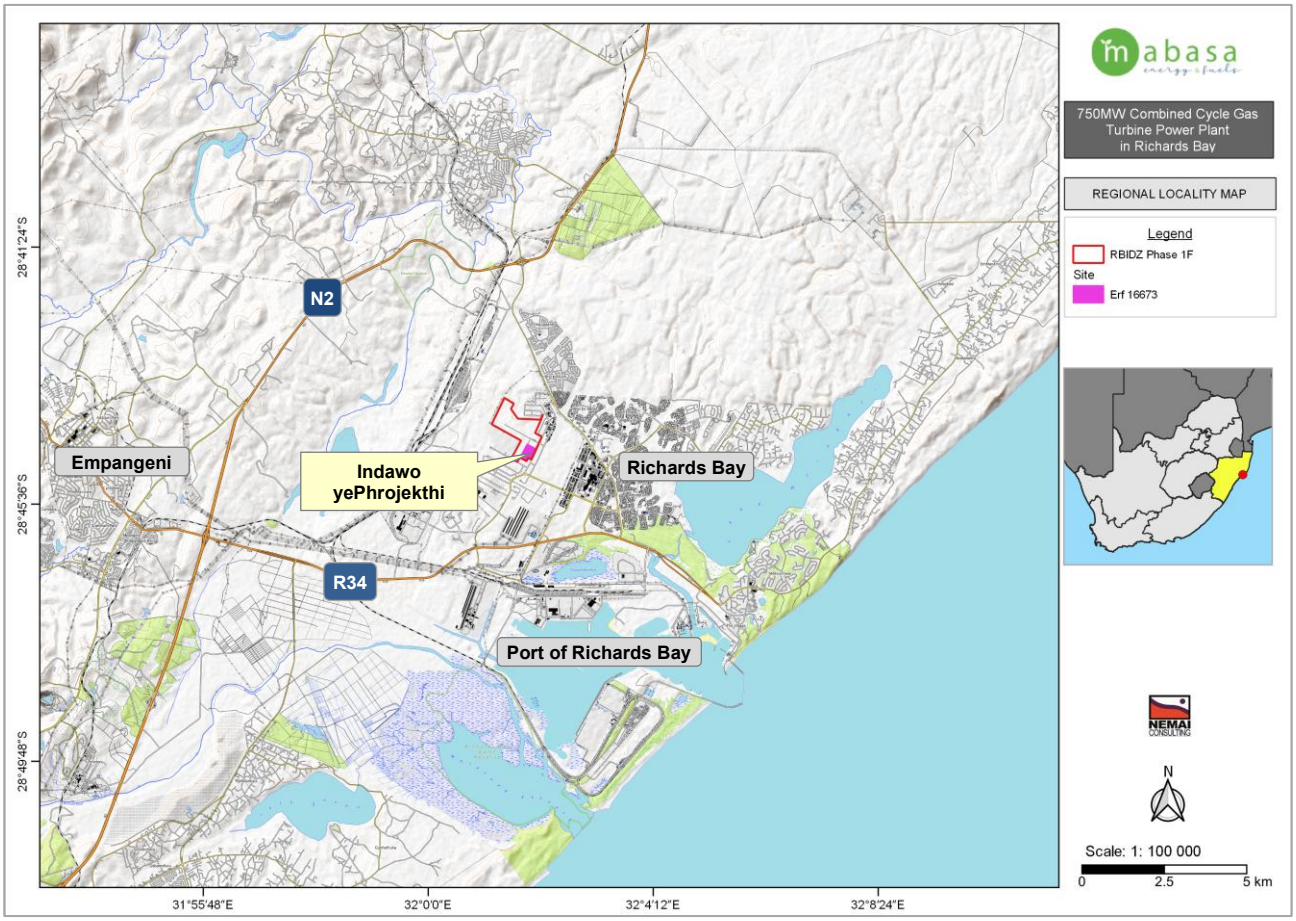
Umfakisicelo uhlose ukufaka isicelo/ukubhida ku-GASIPPPP kanye / noma ezinye izimakethe ezifanele zamandla, futhi ihlongozela ukuthuthukiswa kwemboni ye 750MW Combined Cycle Gas Turbine (CCGT) esendaweniye yase Ricards Bay ewela ngaphansi kwe Cou.. Le Phrojekthi itholakala ngaphakathi kweSigaba 1F seRichards Bay Industrial Development Zone (RBIDZ) ngaphansi kwesivumelwano sokuqasha isikhathi eside. I-RBIDZ, okuyizoni yezomnoto ekhethekile(Special Economic Zone)(SEZ), iyindawo yezimboni ezakhiwe ngokwenjongo futhi evikelekile exhumene nePort of Richards Bay (PoRB) ehlose ukuheha ukutshalwa kwezimali okuqondile kwindawo ezisezweni lethu nakwamanye amazwe.

I-Nemai Consulting (Pty) Ltd yaqokwa nguMfakisicelo njengoMqeqeshi ozimele wokuhlola imvelo ukuze enze i-Environmental Impact Assessment (EIA) yale Phrojekthi.

C. INDAWO YEPHROJEKTHI

Indawo yephrojekthi itholakala e-Alton North ngaphakathi kwe-Ward 2 ye-CoU, cishe iqgele ngamakhilomitha angu 1.5 ubude ukusuka eRichards Bay Central Business District (CBD) (bheka ibalazwe ngezansi).

Indawo ebekelwe eceleni itholakala ku-Erf 16673 ku-Phase 1F ye-RBIDZ, engaba amahekhtha ngu-12 ubukhulu indawo lapho itholakala khona okwamanje iyi “Noxiuos Industry. Indlela yokufinyelela endaweni yezimboni ihamba ngomgwaqo u-Alumina Allee Road, ohamba ngasemngceleni wasempumalanga wendawo. Izixhumanisi zlesi lsikhungo esilinganiselwe sesayithi yilezi 28°44'44.2202 "S 32°1'52.938"E.



Ibalazwe lendawo yesifunda

D. ISISHAYAMTHETHO NEMIHLAHLANDLELA ECATSHANGELWE

Izishayamthetho ezifanele zinomthwalo kuProjekthi ehlongozwayo ngombono wezemvelo okuxoxwengakho kafushane kulo Mbiko we-EIA

Ubudlelwane phakathi kweProjekthi kanye nezingcezu ezisemqoka ezilandelayo zomthetho wezemvelo nazo zichazwa:

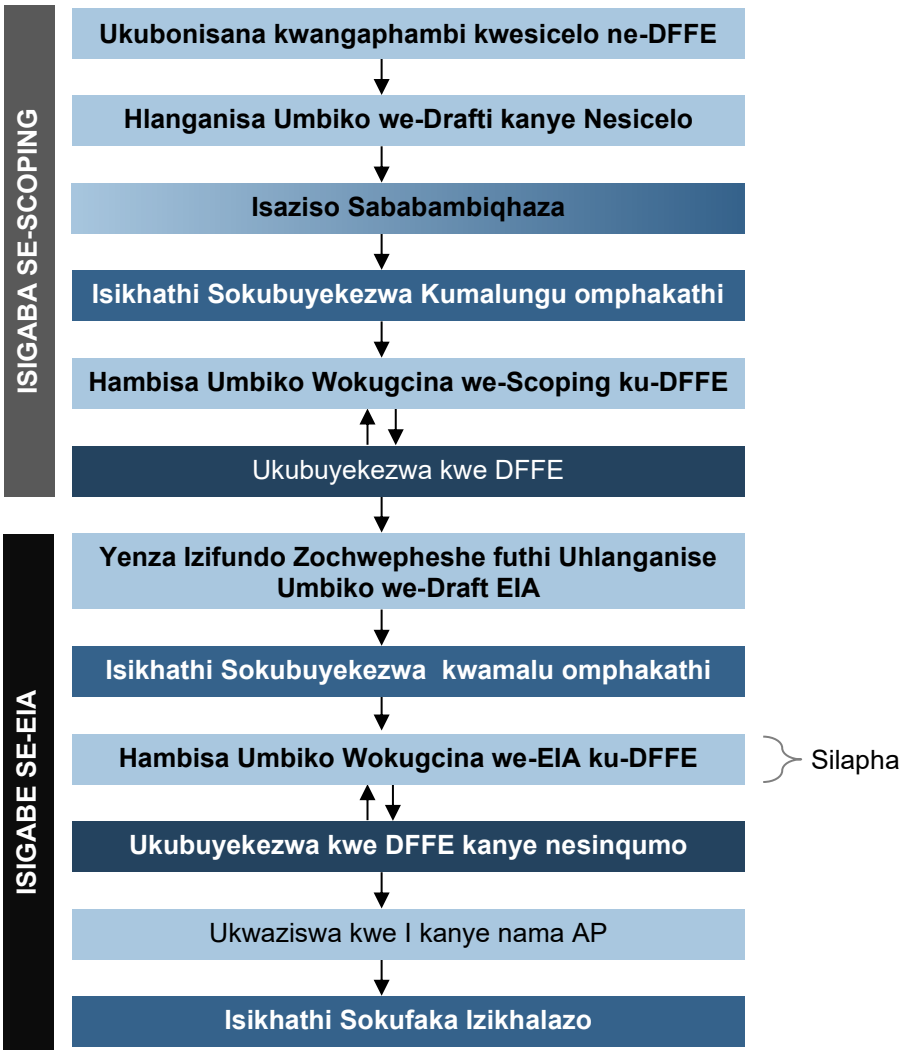
- Umthetho kaZwelonke wokuPhathwa kweMvelo (uMthetho No. 107 ka 1998);
- Umthetho Wamanzi Kazwelonke (Umthetho No. 36 ka 1998);

- Umthetho kaZwelonke wokuphathwa kwemvelo: imfucuza (uMthetho No. 59 ka-2008);
- Ukuphathwa Kwemvelo Kazwelonke: Umthetho Wekhwalithi Yomoya (Umthetho No. 39 ka-2004);
- Umthetho kaZwelonke wokuphathwa kwemvelo: Ukuhlukahluka kwezinto eziphilayo (uMthetho No. 10 ka-2004); kanye
- Umthetho kaZwelonke Wezinsiza Zezamasiko (uMthetho No. 25 ka 1999).

E. INQUBO YE-SCOPING NE-EIA

Inqubo yokufuna ukugunyazwa kwemvelo kweProjekthi ngaphansi koMthetho kaZwelonke wokuPhathwa kweMvelo (uMthetho No. 107 ka-1998) (NEMA) yenziwa ngokuhambisana neMigomo ye-EIA ka-2014 (njengoba ushintshiwe). Ngokwezaziso zikahulumeni,(GN) 779 ka ntulikazi ngonyaka ka 2016,uNqongqoshe Wezamahlathi onikeza igunya lokuhola ukuthatha izinqumo kulesi sicelo njengoba kulungisiwe kwimisebenzi ehlobane ne IRP 2010-2030. Yingakho isicelo se EU safakwa kumnyango wezamahlathi,nezemvelo. (DFFE).

Ngokusekelwe emisebenzini efakwe ohlwini lokuhlolwa okudingekayo kwemvelo kwiProjekthi , kunenqubo ye S&EIR. Uhlaka lwenqubo yilolu olulandelayo.



Uhlaka lweNqubo ye-S&EIR

F. INCAZELO YEPHROJEKTHI

I-Module ehlongozwayo ye-Combined Cycle Power Plant (CCPP) izoba namandla angama megawathi angu750. I-Module iqukethe ama-Turbine wegesi amabili (2) ngayinye inomthamo ongaba ngu-250 amamegawathi kanye nama-Jeneretha asebenza ngogesi, ama-Heat Recovery Steam Generators amabili (2) (HRSGs) futhi ne-Steam Turbine Generator eyodwa (1) (STG) enomthamo ongaba ngu-250amamegawathi. I-CCPP isuselwe kusimo sakamuva sobuciko enesisindo sohlobo lwe-Gas Turbines GE 9FA, elungele ukulayisha okuyisisekelo nokusebenza komthwalo wama-cyclic kukho kokubili umjikelezo olula (ovulekile) kanye nemodi yomjikelezo ohlangene.

II-

Ukuze kutholakale umoya ongokwemvelo onesisekelo senqalasizinda elandwe kwamanye amazwe, I Transnet National Ports Authority (TNPA) Ihlongoze ukwakhiwa kwe terminali ye Liquifier ye gesi PoRB, ebizwa ngokuthi I Zulu Land Energy Terminal (ZET). Umfakisicelo uzofuna futhi alethele abayidingayo le gesi engokwemvela kuloluhlelo lokuthuthukisa I Theminali.

Legesi engokwemvelo ilindileke ukuba itholakale ngamaphayiphi kwa gasi engokwemvelo yakwa Transethi imikiswe kumboni.

Imishini yegesi iyakwazi nokusebnza ngoketshezi lwepethololi umu umkhiqizo wegesi engokwemvelo iphela

Ukufinqwa kweProjekthi kungalendlela elandelayo.

Ukufingwa kwe Projekhti

Izingxenye	Izincazelo
Indawo okuyosetshenzwa kuyo	Erf 16673 ku Phase 1 F, we RBIDZ
Umnikazi womhlaba	Umnini wamhlaba u RBIDZ. Indawo ingaphansi kwesivumelwano sokuqasha sesikhathi eside
Indawo ngaphandi kuka Masipala	KCDM (District) kanye ne CoU (Endaweni yangakithi)
Emandla okukhiqizwa kogesi	Lemboni iyokwakhelwa ukusebenzela phansi ngama megawathi angu 500(MW) kalula nje ukusebenza kukunye kanye no 750 megawathi, naleyo ehlanganisiwe.
Ubuchwepheshe obuhlongoziwe	Iimboni yokukhiqizwa kogezi , I CCGT, Izosebenzisa I jeneretha ukuze ikwazi ukuphahla ugesi isebenzisa igesi engokwemvelo ukuze yenze amafutha, ukufuthunyezwa okungasasetshenziswa kuysetshenziselwe ukukhiqiza umusi, ukuze yenze omunye ugezi ngomshini okhiqiza umusi. Umshini we gazi usebenza ngemjikelezo we Brayton, laphi umoyo uqala khona ukuhlwengisiswa, bese umoya ocindezelwa uyafuthunyezwa ngokuvuthisa kwamafutha wenvula, ukucindezelwa okuphakame okuvutheni kuyanda yingxenye yomshini we turbain, futhi okusele kuphusa legesi ku HRSG beseye iyama Okufudumulanga okuphuma emoyeni oshishiwe, uphinde utholakale ku HRSG ukuze ibangengele ukucindezeleka okwengeziwe, nomusi osizingeni lokushisa eliphakame, futhi lokhu kuvele kwandiswe kumshini womusi, bese kushintshelwa ekubeni ngamanzi. Lawo manzi abuyiselwa ku HRSG. Lamanzi anomusi axhunyaniswe ne HRSG asebenza ku Rankine. Uma esedlule ku HRSG, igesi yamafuthi izophelela emoyeni. Imboni ehlongozwayo izosebenzisa ubuchwepheshe obamuvanje obuthuthukisiwe
Ubukhulu bendawo	Cishe ngama hekutha angu 12,7 ubukhulu
Ubukhulu bendawo eyimboni	Cishe ngakahekutha angu 12, 2 ubukhulu

Izingxenye	Izincazelo
Amadayimentshini wokupaka	Imboni kufanale ikwazi ukuthwala okungenani isisindo esingama mitha angu 30 ubude, kube nokudlondlobala phakathi okungamamitha angu 6, 9 khona kuzopakwa okunye Namamitha angu 60 nokudlondlobala obucishe bube ngu 3, 6 amamitha ukupaka I HRSG
Ukuphaka kwendao	Ukuphakama kwendawo cishe kungamamitha angu 40 ukuya ku 43 uma ubuka kwisilinganiso seleveli yolwandle
Uhlobo lwamafuthi azosethsenzswa kulemboni	LNG, Izosekelwa I dizili izikhathi ezimfishane uma kunokuphazamiseka kwegesi
Ukutholaka kwendawo	Ukuze uthole lendawo, ku phase 1 RBIDZ, sebenzisa umgwaqo I Alumina Allee. Lendawo isondelene nendawo yokuhla yabantu ngakumgqwaqo ophumayo **Indawo yokwakhiwa** Imfuneko yamanzi ngesikhathi sokusebenza (amanzi apholisayo): • Amanzi okuphuza nawasekhaya: 6 000 ℓ/ngosuku • Amanzi ahlanzwe ngokuphelele (demineralised water) e-HRSG nakwezinye izinjongo: 256 000 ℓ/ngosuku • Amanzi ezinsizakalo: 48 000 ℓ/ngosuku • Amanzi okupholisa: 21 000 000 ℓ/ngosuku Uma kubhekwa ukulahlekelwa kwamanzi ngesikhathi sokuhlanza nokwelashwa kwamanzi: • Amanzi okuphuza: 415 000 ℓ/ngosuku • Amanzi amaningi acwengiwe (bulk clarified water): 21 000 000 ℓ/ngosuku Amanzi azotholakala ku-uMngeni-uThukela Water (UUW).
Ingqalasizinda ehlotshanisiwe	• Ikamu lezakhiwo , endaweni • Ama-work shop • I-hovisi elikhulu • Ukulawulwa kwebhilidi • I -warehouse • Indlu yokuphampwa kwamanzi • Izindawo zokunakekela lendawo • Izindawo ze Ablution • Indlu yonogada • Amafensi kanye namasango • Izikhungo zokuphathwa kwemfucuza Okulandelayo okuyotholakala ngobuningi kwabakwa RBIDZ Phase 1 • Amazni aphathwayo • Amanzi amaningi acwengiwe • Amzni agcolile • Amanzi wezimvula • Imigwaqo • Ugesi Izinsiza eziyotholakala kwezinye izindawo ziyodingelwa • Ukususwa kwe oyili engsasetshenziswa • Ukususwa kwamanzii anokungcola angasasetshenziswa

Lesi sicelo asihlanganisi amagesi angokwemvelo kumapayiphi kanye nokuxhiumana okuhlobonele lakoku kuthuthuka okuhlongoziwe

G. UKUBHEKWA KWEZINYE IZINTO EZINGASETSHENZISWA

Izindlela enziningana ziye zabhekwa kulesicelo esihlongoziwe sama megawathi angi 750 CCGT Power Plant ukuthola efaneleka kakhudlwana ukuze kufinyelelwe imigomo yeProjekthi.

Ezinye zezinto eziye zabhekwa zaluprojekthi , futhi kwaxoxwa ngazo kumbiko we EIA:

- ❑ Ukwenzi kokuphehlwa kogesi
- ❑ Indawo

- Uhlobo lwamafutha
- Ubukhulu be Projekthi
- Ubuchwepheshe bomshini in Turbine
- Ubuchwepheshe be HRSG kanye ne STG
- Ubuchwepheshe bokupholisa
- Ukungezni lutho/ akuzikhethela ukungayi

Kuyekwaphothulwa ukuthi Igesi engokwemvelo I CCGT, Nendawo yayo esondelene ne Phase 1F ye RBIDZ, imelele loku okuzokhethwa , ngoba ikwazi ukunikeza ukukhiqizwa kogesi okwanwlisayo ngendlela efanayo isebenzoisa ngokwesilanginiso esifano umhlaba ebekelwe ukwenza lookhu kuthuthukiswa kulemboni.

Ubuchwepheshe obukhethiwe bukhulisa ukukhiqizwa ngamandla ngokwanele, ukukwehla kokusetshenziswa kwamafutha,kanye nobuchwepheshe obusetshenziselwa ukukhiqizwa kwamafutha ambiwayo, futhi kuyahambelana nengqalasaizinda kanye nezinsiza ezitholakala ku RBIDZ.

H. IPHROFAYILI YENDAWO EZOKWAUKELA LOKHU

Umbiko we-EIA unikeza incazelo ejwayelekile yesimo sendawo etholayo endaweni yephrojekthi. Lokhu kusiza ukuhlinzeka ngesimo lapho umsebenzi we-EIA wenziwa khona . Iphinde ivumele ukubonga izici ezibucayi zemvelo kanye nama-receptors angenzeka njengemiphumela yeProjekthi ehlongozwayo.

Izici ezilandelayo zendawo etholayo zixoxwa kuMbiko we-Scoping:

- Ukusetshenziswa Komhlaba
- Ukumbozeka komhlaba
- Isimo sezulu
- I-Geology nomhlabathi
- Hydrogeology
- Topography
- Amanzi
- Izindawo Zasemfuleni
- Izinhlobonhlobo zezinto eziphilayo zomhlaba
- Imvelo Yezenhlalo Nezomnotho
- Ikhwalithi yomoya
- Ikhwalithi yomoya
- Ikhwalithi yokubona
- Imisindo noudlidliza
- Ezolimo
- Ukuhlela
- imfuquza
- Ezokuthutha
- Ezamasiko kanye ne Palaeontology
- Izakhiwo ezikhona kanye nezingqalasizinda
- Impilo

I. UCWANINGO LOCHWEPHESHE

Ucwaningo olulandelayo lwenzelwe iProjekthi, kubhekwa imiphumela ye Scoping kanye nokuhlolisiswa

- Climate Change Impact Assessment
- Air Quality Impact Assessment
- Freshwater Ecosystem Assessment

- ❑ Terrestrial Biodiversity Assessment
- ❑ Floral (Plant Species) Assessment
- ❑ Fauna (Animal Species) Assessment
- ❑ Visual Resource Compliance Assessment
- ❑ Hydrology Assessment]
- ❑ Noise Impact Assessment
- ❑ Geotechnical Assessment
- ❑ Desktop Palaeontology Impact Assesssment
- ❑ Agricultural Agro-Ecosystem Assessment
- ❑ Health Impact Assessment
- ❑ Socio-Economic Impact Assessment
- ❑ Social Impact Assessment
- ❑ Quantitative Risk Assessment

I Traffic Impact Assessment nayo yenziwe kakhudlwana ku Phase 1ukuze kuthuthukiswe i RBDDZ Lolulwazi olutholakale emibonweni yocwaningo olwenziwe ochwepheshe luhlanganiswe ne EIA Ubiko ungalendlela elandelayo:
imibono ecatshangelwayo nemikhawulo iveziwe kucwaningo ngalunye futhi ifakwe kulolocwaningo

- ❑ Ulwazi luye lwasetshenziswa ukuqedelella incazelo yendawo ezokwamukela lokhu ngendlela ecacile lapho lomsebenzi uyokwenzeka khona
- ❑ ukufingqwa kocwaningo lochwepheshe ngamunye lunikeziwe, olubheka indlela lolu cwaningo olwenizwe ngayo, okutholakele kulo, kanye nokutholakala kuso isiphetho salo.
- ❑ Ukuhlolwa komthelela okwenziwe ngabacwaningi abangochwepheshe,kanye nokuvezwe njengokunciphisa umthelela nakho kuye kwafakwa kumthelela wonke wale Projekthi yonke
- ❑ Imibono yabochwepheshe itholakele ukulungisa ukuphawila okwenzwe abanesitakazelo kanye nabathinthekayo (I&AP's) ebandakaya izici zemvelo mayelana nocwaningo olweziwe uchwepheshe ngamunye
- ❑ Iziphakamiso ezigqamile ezenziwe ochwepheshe zithathiwe zabekwa phambili kwiziphetho ezithathwe I EIA.
- ❑ Sekukonke nje, uncwaningo luphethe ngokuthi awekho amaphutha angabulala abonakele anagvimbela lokukuthuthuka, ngaphandle nje uma isiphakamiso ezibekiwe kanye nezinyathelo ezifanele zingathathwa bese zenziwe.

J. UKUHLOLWA KOMTHELELA

Umbiko wokuhlolwa kwe EIA kumthelela ongaba khona kuyo imvelo ubangelwa izenzakalalo ngaphambi kokwakhiwa, uma sekwakhiwa kanye nalapho sekuqala ukusetshenzwa kelu Projekthi:
Imithelela engaba khona ebonakaliswe ngalendlela elandaleyo:

- ❑ Imithelela ehambisana nemisebenzi engaphakathi kwe mibiko ebekiwe kumithetho-nqubo ye EIA.
- ❑ Imithelela ebekiwe lapho sekwenziwa I Scoping.
- ❑ Ukuhlolwa ngokucophelela kwemisebenzi ye Projekthi kanye nengqalasiszinda ehlongozwayo.
- ❑ Ukuhlolwa kwndawo eyokwamukela lomsebenzi, ezenhlalo, ezomnotho kanye nezindawo ezakhiwe.

- Izinkinga ezivezwe abanamagunya kwezemvelo.
- Ukuphawulwa okutholakele emuva kokubandakanya umphakathi kuma I&AP's.

Indlela yokukhetha esetshenziswe ukuhlola okungase lube nomthelela kwimvelo okuhambisana ne Projekthi, kuhlananganise, ubukhulu,isikhathi esiyothatha, okungenzeka nokubalulekile. Izinyathelo ezifanelekayo ziye zavezwa ukuze kubhekwe izingozi kulendawo ekhethiwe kanye nezinyathelo eziyothathwa ukunciphisa umthelela.

Izinyathelo zokunciphisa umthelela ezihambisana ne Projekthi zifaka ngokukhethekile izinyathelo ezibekiwe ithimba lochwepheshe (elihlanganisa izixazululo zonjinyela) ochwepheshe bezemvelo, imibandela ebekwe abasemagunyeni bezemvelo, nalokhu okuyimikhuba ejwayelekile yezemvelo. Ukuhlolwa kwemithelela izilinganiso ezikhethekile ngaphambili ngisho nasemuva kwezinyathelo ezibekelwe ukunciphisa umthelela, evezwa imithelela engasala.

Loku kuhlolwa kubonisa inani elikhudlwana lomthelela ongaba khona ozohambisana nokuthuthukiswa kwalendawo, noma kunjalo uma kubhekwa okutholwe ochwepheshe nocwaningo lwabo, lemitheleleayobonakalisi amaphutha angabangela ukufa. Yize eminye imithelela, efana nokukhishwa I green-house,ukuthitheka okukhona ngenxa yekhwalitthi yomoya, ubungozi obuhambisan nezinto eziyingozi ezisetshenziswayo, kungaba kukhulu uma kungalawuliwe, lokhu kungacishiselwa kumazinga amukelekayo ngemiklamo elawuloyo yonjinyela, iziyathelo ezibekiwe kwimvelo, izinhlelo eziqaphela futhi zihambisane nezishayamthetho kanye namazinga abekiwe.

Lokhu kuhlolwa kubonanise nomthelela wonke kulendawo ese Richards Bay, kuqashelwa ukuqoqana okuningi kwezimboni kanye nokuthuthukiswa kwengqalasizinda. Yize kunjalo umthelela kuyo imvela ungabakhona, I Projekthi ibonakala ihambelana nokusetshenziswa kwe RBIDZ kumhlaba wezimboni futhi uzohambela nendawo eyokwamukela lokhu, uma nje izinyathelo ezibekiwe zokunciphisa umthelela sisetshenziswa. Futhi, uma ngabe umthelela uyoba khona, ikakhulukazi umthelela ohambelana nokuphumela emkhathini kanye nokushintsh sitsha kwesimo sezulu, siyofana nomthelela osele ongagwemeki ngokuphelele, lemithelela ayibhekwanga ochwepheshe njengaba emikhulu engavimbela ukuthuthuka kwale Projekthi.

Imiphumela "yokukheha ukungayi lapho" nayo ibhekiwe. Ukukhetha ukungayi lapho kuye kwacatshangelwa njengoba kukhuthazwa ukuba khona kwale Projekthi, indaba yokungayi nhlobo lapjo iyogwema imithelela engaba khona kuyo imvela endaweni ehambelana ne Projekthi, kodwa futhi umphumela wayo ungaba ukuthi ngeze zisatholakala izinzuzo ezingokomnotho nenhlalakahle , kuhalanganise nokukhiqizwa ngamandla kogesi.

Uhllo lwe Enviromental Management (EMPr) elihambelana nombiko we EIA unikeza incazelo ejulile kanye nohlu lwezinyathelo ezingathathwa ukunciphisa umthelela uma kuqhutshekwa ngale Projekthi, kanye nendawo eyoyamukela.

Lokhu okuqkethwe ku EMPr kutholwe ku Appendix 4 yeMithethonqubo ye-EIA ka-2014 (njengoba ichitshiyelwe) wemithethonqubo ye EIA ka 2014, njengoba usulungisiwe.

K. PUBLIC PARTICIPATION

Umbiko we-EIA unikeza imininingwane mayelana nemisebenzi eba yingxenye yokubamba iqhaza komphakathi:

- Ukubamba iqhaza komphakathi okuphothukwe phakathi ne Scoping.
- Ukubamba kweqhaza komphakathi phakathi nenkathi ye EIA-
  - Ukugcinwa kwemininingwane yalabo ababab iqhaza
  - Ukubuyekezwa kwesikhathi esibekiwe se Drafti yokubhalwa kombiko we EIA
  - Ukumenyezelwa kokubuyekezwa kombhalo we Drafti yombiko we EIA
  - Iizindlela zokuthola umbhalo we Drafti yombiko we EIA
  - Ukuphawula kumbhalo we Drafti yombiko we EIA
  - Umhlangano womphakathi wokwethula umbhalo weDrafti yombiko we EIA

L. IZIPHETHO NEZIPHAKAMISO

Lemisebenzi elandelayo ibhekiwe phakathi nesigaba se EIA kule Projekthi ehlongozwayo

- Ochwepheshe abenze ucwaningo babonise uhlelo lokucwaninga I EIA, okwenziwe futhi abakutholile kuye kwafaka ukuze kuhambelana nombiko we EIA endabeni yokuqonda isimo sendawo nemvelo kanye nezci ezibucayi, babheka umthelela ongaba khona, futhi basungula nezinyathelo ezingasetshenziswa ukuncihisa umthelela.
- Imithelela engaba khona ngaphambi kokwakhiwa, emuva kokwakhiwa kanye nalapho sekuqala ukusetshenzwa iye yavezwa, futhi yahlolwa, nezinyathelo zokunciohsa umthelela zavezwa futhi,
- Ezinye izindleal zokufinyelela umgomo kulomsebenzi ohlongoziwe ziye zacatshangelwa, kabonakala okukhethwayo.

Amehlo adonseleke kwizici ezibucayi zemvelo ezibekelwe izinyathelo zokugwema umthelela eziye zafakwa kumbiko we EIA kanye neEMPr. Ibalazwe elibonisa izindawo ezibucayi ikakhulukazi endaweni okutholakala kuyo amanzi okuphuzwa,uhlelo lwemvelo,kanye nezinhlobonhlobo zezinto eziphilayo nako kubonisiwe.

Isitatimende somthelela kwezemvelo naso sinikeziwe neziphakamiso ezisemqoka zibekwe phambili ukuze zibe nethonya kwimibandela yebamagunya kwezemvelo (Enviromental Authorisation) uma ngabe izovunyelwa.

Ngokwalokhu okutholwe abacwaningi abangochwepheshe kanye neziphumo ze EIA, kuphethwe ngokuthi abanamagunya kwezemvelo banganikezwa le Projekthi, uma nje konke lokhu okuveziwe Njengezinyathelo zokulawula kumthelela ongaba khona zisetshenziswa futhi zilandelwa ngendlela efanele. Futhi kungumbono wochwepheshe ohlola ezezemvela(EAP) kanye nethimba lezezemvelo ukuthi I EIA, yenziwe ngendlela efanele futhi engachemile nokuthi inqubo kanye nombiko we EIA uhambelana nezinfuneko namibandela ebekiwe kumithethonqubo ye EIA yonyaka ka 2014, njengoba usulungisiwe.

AMENDMENTS PAGE

Date	Nature of Amendment	Amendment No.
August 2026	Draft for review by authorities and the public	0
September 2026	Final for submission to DFFE for decision-making	1

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LIST OF ACRONYMS & ABBREVIATIONS

ACC	Air-Cooled Cooling
AEL	Atmospheric Emission Licence
AIDS	Acquired Immunodeficiency Syndrome
AIR	Atmospheric Impact Report
ALARP	As low as reasonably practicable
AoI	Area of Influence
AQMS	Air Quality Monitoring Station
AR6	Sixth Assessment Report
ASAPA	Association of Southern African Professional Archaeologists
BAS	Best Attainable State
BI	Biodiversity Importance
BOP	Balance of Plant
BPEO	Best Practicable Environmental Option
BSP	Biodiversity Sector Plan
Ca-HCO_3	Calcium Bicarbonate
CBA	Critical Biodiversity Area
CBD	Central Business District
CCGE	Closed Cycle Gas Engine
CCGT	Combined Cycle Gas Turbine
CCPP	Combined Cycle Power Plant
CEMS	Continuous Emissions Monitoring Station
CI	Conservation Importance
CITP	Comprehensive Integrated Transport Plan
CMB	Central Monitoring Basin
CNG	Compressed Natural Gas
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COPD	Chronic Obstructive Pulmonary Disease
CoU	City of uMhlathuze
CR	Critically Endangered
CRR	Comments and Reponses Report
CTG	Combustion Turbine generators
DALRRD	Department of Agriculture, Land Reform, and Rural Development
DARD	Department of Agriculture and Rural Development
DCS	Distributed Control System
DEA	Department of Environmental Affairs
DEA&DP	Department of Environmental Affairs and Development Planning
DEAT	Department of Environmental Affairs and Tourism
DEDTEA	Department of Economic Development, Tourism & Environmental Affairs
DEL	Department of Employment and Labour
DFFE	Department of Forestry, Fisheries and the Environment

DHB	District Health Barometer
DLN	Dry Low NO_x
DM	Demineralised
DMPR	Department of Mineral and Petroleum Resources
DMRE	Department of Mineral Resources and Energy
DTM	Digital Terrain Model
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EFZ	Estuarine Functional Zone
EHA	Environmental Health Area
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
EKZNW	Ezemvelo KZN Wildlife
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
EMS	Environmental Management System
EN	Endangered
ESA	Ecological Support Area
EstMP	Estuarine Management Plan
FEPA	Freshwater Ecosystem Priority Area
FI	Functional Integrity
FSRU	Floating Storage and Regasification Unit
FSU	Floating Storage Unit
GASIPPPP	Gas Independent Power Producers Procurement Programme
GBV	Gender Based Violence
GDP	Gross Domestic Product
GE	General Electric
GHG	Greenhouse Gas
GIS	Geographical Information System
GN	Government Notice
GPS	Global Positioning System
GSU	Generator Step-Up
GTG	Gas Turbine Generator
GTP	Gas-to-Power
GVA	Gross Value Added
GWP	Global Warming Potential
HILP	High Impact Low Probability
HIV	Human Immunodeficiency Virus
HP	High-Pressure
HRSG	Heat Recovery Steam Generator
HV	High Voltage
AIP	Alien Invasive Plant

I&APs	Interested and Affected Parties
ICE	Internal Combustion Engine
IDP	Integrated Development Plan
IFC	International Finance Corporation
IPB	Isolated Phase Bus
IPPC	Intergovernmental Panel on Climate Change
IRP	Integrated Resource Plan
IUCN	International Union for Conservation of Nature
IWMP	Integrated Waste Management Plan
KCDM	King Cetshwayo District Municipality
KZN	KwaZulu-Natal
KZN BP	KwaZulu-Natal Biodiversity Plan
LDAR	Leak Detection and Repair
LHV	Lower Heating Value
LNG	Liquefied Natural Gas
LOC	Loss of Containment
LP	Low-Pressure
LV	Low Voltage
MHI	Major Hazard Installation
MIR	Maximum Individual Risk
MRF	Material Recovery Facility
NAAQS	National Ambient Air Quality Standards
NAEIS	National Atmospheric Emission Inventory System
NBA	National Biodiversity Assessment
NDP	National Development Plan
NEMA	National Environmental Management Act (No. 107 of 1998)
NEM:AQA	National Environmental Management: Air Quality Act (Act No. 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEM:WA	National Environmental Management: Waste Act (Act No. 59 of 2008)
NFA	National Forests Act (Act No. 84 of 1998)
NFEPA	National Freshwater Ecosystem Priority Area
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NPA	National Ports Act (Act No. 12 of 2005)
NPAES	National Protected Area Expansion Strategy
NWA	National Water Act (Act No. 36 of 1998)
NWM	National Wetland Map
OEM	Original Equipment Manufacturer
OHS	Occupational Health and Safety
PADHI	Planning Advice for Developments near Hazardous Installations
PDFP	Port Development Framework Plan
PES	Present Ecological State
PHC	Primary Health Care
PM	Particulate Matter

PMP	Port Master Plan
POC	Probability of Occurrence
PoRB	Port of Richards Bay
PPE	Personal Protective Equipment
RBCAA	Richards Bay Clean Air Association
RBIDZ	Richards Bay Industrial Development Zone
REC	Recommended Ecological Class
RLE	Red List of Ecosystems
RMO	Recommended Management Objective
RMPP	Risk Mitigation Power Plant
RMT	Road Motor Transport
RO	Reverse Osmosis
RR	Receptor Resilience
S&EIR	Scoping and Environmental Impact Reporting
SA	South Africa
SAAQIS	South African Air Quality Information System
SACAD	South African Conservation Areas Database
SACNASP	South African Council for Natural Scientific Professions
SAGERS	South African Greenhouse Gas Emission System
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SAM	Social Accounting Matrix
SANBI	South African National Biodiversity Institute
SANS	South African National Standard
SAPAD	South African Protected Areas Database
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SEI	Site Ecological Importance
S&EIR	Scoping and Environmental Impact Reporting
SEZ	Special Economic Zone
SIP	Strategic Integrated Project
SMME	Small, Medium, and Micro Enterprise
SO_2	Sulphur Dioxide
SSV	Site Sensitivity Verification
STG	Steam Turbine Generator
STI	Sexually Transmitted Infection
SWSA	Strategic Water Source Area
TDS	Total Dissolved Solids
TEU	Twenty-Foot Equivalent Units
TNPA	Transnet National Ports Authority
ToR	Terms of Reference
UAT	Unit Auxiliary Transformer
ULSD	Ultra-Low Sulphur Diesel
UNFCCC	United Nations Framework Convention on Climate Change
UUW	uMgeni-uThukela Water

VAC	Visual Absorption Capacity
VOC	Volatile Organic Compound
VU	Vulnerable
WBG	World Bank Group
WC	Wet Cooling
WHO	World Health Organization
WMA	Water Management Area
WUL	Water Use Licence
ZET	Zululand Energy Terminal

UNITS OF MEASUREMENT

°C	Degrees Celsius
%	Percentage
dBA	A-weighted decibels
ha	Hectare
kg	Kilogram
kg/cm²	Kilograms per square centimetre
kg/MWh	Kilograms per megawatt-hour
kg/Nm³	Kilograms per normal cubic metre
kPa	Kilopascal
kV	Kilovolt
kWh	Kilowatt-hour
km	Kilometre
km²	Square kilometre
km/hr	Kilometres per hour
L	Litre
L/d	Litres per day
L/s	Litres per second
m	Metre
m²	Square metre
m³	Cubic metre
m³/d	Cubic metres per day
m³/hr	Cubic metres per hour
m³/s	Cubic metres per second
mamsl	Metres above mean sea level
mg/m³	Milligrams per cubic metre
mg/Nm³	Milligrams per normal cubic metre
MJ/kg	Megajoules per kilogram
MJ/Nm³	Megajoules per normal cubic metre
MVA	Mega Volt-Amperes
MW	Megawatt
MWh	Megawatt-hour
MWth	Megawatt thermal
µg/m³	Micrograms per cubic metre
µm	Micrometre
ppm	Parts per million
ppmv	Parts per million by volume
ppmvd	Parts per million by volume, dry basis
ppb	Parts per billion

t	Tonnes
tCO_2e	Tonnes carbon dioxide equivalent
t/a	Tonnes per annum
µS/cm	Microsiemens per centimetre
yr	Year
yrs	Years

1 PURPOSE OF THIS DOCUMENT

Nemai Consulting was appointed by Mabasa Energy and Fuels (Pty) Ltd (the "Applicant"), to conduct the Scoping and Environmental Impact Reporting (S&EIR) process for the **proposed 750MW Combined Cycle Gas Turbine Power Plant in Richards Bay, City of uMhlathuze (CoU) Local Municipality, King Cetshwayo District Municipality (KCDM), KwaZulu-Natal** (KZN) (the "Project").

The S&EIR process is being undertaken according to the process prescribed in the Environmental Impact Assessment (EIA) Regulations of 2014, published under Government Notice (GN) No. 982 in Gazette No. 38282 of 4 December 2014 and amended by GN No. 326 of 7 April 2017 published in Gazette No. 40772 (the "EIA Regulations"). The EIA Regulations were promulgated in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA).

To date, the Scoping Phase of the environmental assessment process for the proposed Project has been completed. The Final Scoping Report and Plan of Study for EIA were accepted by the Department of Forestry, Fisheries and the Environment (DFFE), the competent authority in terms of NEMA, on 1 June 2026. The acceptance of the Scoping Report authorised the Project to proceed to the Environmental Impact Reporting phase. This document therefore constitutes the **Final EIA Report** for the proposed Project.

According to the EIA Regulations, the objectives of the EIA process are to undertake the following, through a consultative process:

- Determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context.
- Describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the development footprint on the approved site as contemplated in the accepted Scoping Report.
- Identify the location of the development footprint within the approved site as contemplated in the accepted Scoping Report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment.
- Determine the -
  - Nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives.
  - Degree to which these impacts -
    - Can be reversed;
    - May cause irreplaceable loss of resources; and
    - Can be avoided, managed or mitigated.

- Identify the most ideal location for the activity within the development footprint of the approved site as contemplated in the accepted Scoping Report based on the lowest level of environmental sensitivity identified during the assessment.
- Identify, assess, and rank the impacts the activity will impose on the development footprint on the approved site as contemplated in the accepted Scoping Report through the life of the activity.
- Identify suitable measures to avoid, manage or mitigate identified impacts.
- Identify residual risks that need to be managed and monitored.

The Draft EIA Report was made available to Interested and Affected Parties (I&APs) for a 30-day review period from 6 August until 7 September 2026. All comments that were received have been addressed in this Final EIA Report and have also been included in the Comments and Responses Report (CRR). This Final EIA Report is being submitted to the DFFE for review and decision-making.

2 DOCUMENT ROADMAP

As a minimum, this EIA Report aims to satisfy the requirements stipulated in Appendix 3 of the EIA Regulations. Table 1 below presents the document's composition in terms of the aforementioned regulatory requirements.

Table 1: EIA Report Roadmap

Chapter	Title	Correlation with Appendix 3 of EIA Regulations	Description of Content of Appendix 3 of the EIA Regulations
1	Purpose of this Document	–	–
2	Document Roadmap	–	–
3	Project Background and Motivation	–	–
4	Project Location	3(1)(b)	The location of the development footprint of the activity on the approved site as contemplated in the accepted Scoping Report, including: (i) the 21 digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; and (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.
		3(1)(c)	A plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is - (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; and (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken.
5	Legislation and Guidelines Considered	3(1)(e)	A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context.
6	Scoping and EIA Process	3(1)(a)	Details of- (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae.
		3(1)(u)	An indication of any deviation from the approved scoping report, including the plan of study, including- (i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and (ii) a motivation for the deviation.
		3(1)(v)	Any specific information that may be required by the competent authority.
7	Assumptions and Limitations	3(1)(p)	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed.
8	Need and Desirability	3(1)(f)	A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred development footprint within the approved site as contemplated in the accepted Scoping Report.
9	Project Description	3(1)(d)	A description of the scope of the proposed activity, including-

Chapter	Title	Correlation with Appendix 3 of EIA Regulations	Description of Content of Appendix 3 of the EIA Regulations
			(i) all listed and specified activities triggered and being applied for; and (ii) a description of the associated structures and infrastructure related to the development.
		3(1)(g)	A motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report.
		3(1)(h)(i)	A full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including: (i) details of the development footprint alternatives considered.
		3(1)(h)(ix)	If no alternative development footprints for the activity were investigated, the motivation for not considering such.
		3(1)(t)	Where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts.
10	Analysis of Alternatives	3(1)(h)(i)	Details of the development footprint alternatives considered.
		3(1)(h)(ix)	If no alternative development locations for the activity were investigated, the motivation for not considering such.
		3(1)(h)(x)	A concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted Scoping Report.
		3(1)(n)	The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment.
11	Profile of the Receiving Environment	3(1)(h)(iv)	The environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.
12	Summary of Specialist Studies	3(1)(k)	Where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report.
13	Impact Assessment	3(1)(h)(v)	The impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (i) can be reversed; (ii) may cause irreplaceable loss of resources; and (iii) can be avoided, managed or mitigated.
		3(1)(h)(vi)	The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks.
		3(1)(h)(vii)	Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.
		3(1)(h)(viii)	The possible mitigation measures that could be applied and level of residual risk.
		3(1)(i)	A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including - (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and

Chapter	Title	Correlation with Appendix 3 of EIA Regulations	Description of Content of Appendix 3 of the EIA Regulations
			(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.
		3(1)(j)	An assessment of each identified potentially significant impact and risk, including- (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be mitigated.
		3(1)(m)	Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the Environmental Management Programme (EMPr) as well as for inclusion as conditions of authorisation.
14	Public Participation	3(1)(h)(ii)	Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs.
15	Conclusions and Recommendations	3(1)(l)	An environmental impact statement which contains- (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.
		3(1)(o)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.
		3(1)(q)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.
16	References	-	-
Appendix A	Maps & Technical Drawings	3(1)(c)	A plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale.
Appendix C	Oath of Environmental Assessment Practitioner	3(1)(s)	An undertaking under oath or affirmation by the EAP in relation to: (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and IAPs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and any information provided by the EAP to IAPs and any responses by the EAP to comments or inputs made by IAPs.
Appendix E	Specialists' Reports	R23(5)	Specialist Reports containing all information set out in Appendix 6 of GN No. R. 982 of 4 December 2014 (as amended).

Chapter	Title	Correlation with Appendix 3 of EIA Regulations	Description of Content of Appendix 3 of the EIA Regulations
Appendix I	EMPr	R23(4)	Environmental Management Programme containing all information set out in Appendix 4 of GN No. R. 982 of 4 December 2014 (as amended).
Appendix K5	Comments and Responses Report	3(1)(h)(ii)	Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs.
		3(1)(h)(iii)	A summary of the issues raised by Interested and Affected Parties (IAPs), and an indication of the manner in which the issues were incorporated, or the reasons for not including them.
N/A		3(1)(r)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised.
N/A		3(1)(w)	Any other matters required in terms of section 24(4)(a) and (b) of the Act.

3 PROJECT BACKGROUND AND MOTIVATION

3.1 Gas Independent Power Producers Procurement Programme

Following the promulgation of the Integrated Resource Plan (IRP) in 2019, the then Minister of Mineral Resources and Energy determined that the procurement of new generation capacity is required to ensure energy security and that approximately 3 000 megawatts (MW) would be procured, to be generated from gas. The Gas Independent Power Producers Procurement Programme (GASIPPPP) was identified by the former Department of Mineral Resources and Energy (DMRE), which is now known as the Department of Mineral and Petroleum Resources (DMPR), as the appropriate programme to procure the new generation capacity.

The GASIPPPP was designed to procure the target of 2 000 MW of new generation capacity (including Capacity, Ancillary Services and Energy Output) to be derived from land-based gas fired power generation facilities anywhere within the borders of South Africa (SA). The facilities must utilise natural gas to produce the Energy Output and Ancillary Services.

The Transnet National Ports Authority (TNPA) has undertaken a separate procurement process to conclude a 25-year concession agreement for the design, construction, operation and maintenance of a natural gas terminal in the CoU. Accordingly, any Bidders wishing to submit facilities located within the borders of the CoU for participation in this GASIPPPP are required to secure their fuel through the TNPA's natural gas terminal.

3.2 The Project

The Applicant intends to bid for the GASIPPPP and/or other suitable energy markets and has proposed the development of a 750MW Combined Cycle Gas Turbine (CCGT) Power Plant (the "Plant") in Richards Bay, which falls within the CoU. The Project is located within Phase 1F of the Richards Bay Industrial Development Zone (RBIDZ) under a long-term lease agreement. The RBIDZ, which is a Special Economic Zone (SEZ), is a purpose-built and secured industrial estate linked to the Port of Richards Bay (PoRB) which aims to attract local and foreign direct investment.

The PoRB is one of the country's largest ports in size, with total land and water surfaces of 2 174 hectares (ha) and 1 443 ha, respectively. While numerous mining and other products move through the Port, coal remains the single largest export commodity in terms of volumes. The TNPA, which is a division of Transnet Limited, is mandated to control and manage all eight commercial Ports on the South African coastline to ensure efficient and economic functioning while improving safety, health and environmental management. The TNPA operates within a legislative and regulatory environment and is governed by the National Ports Act (Act No. 12 of 2005) (NPA). The TNPA, as the landlord of the PoRB, is in the process of rolling out the development of Port infrastructure

(marine and landside) for a Liquefied Natural Gas (LNG) Import Terminal. The PoRB lies approximately 5 km to the south of the site.

3.3 Strategic Integrated Project

The Project is designated as a Strategic Integrated Project (SIP), and it is thus to be managed within the requirements of the Infrastructure Development Act (Act No. 23 of 2014).

4 PROJECT LOCATION

The project site is located in Alton North within Ward 2 of the CoU, approximately 1.5 km from the Richards Bay Central Business District (CBD) (refer to the locality maps in Figure 1 and Figure 2 below). The earmarked site is located on Erf 16673 in Phase 1F of the RBIDZ (refer to Figure 3 below), which is approximately 12.7 ha in extent. The access point to the industrial complex is via Alumina Allee Road, which runs along the eastern boundary of the site.

The coordinates of the property's boundaries are provided in Table 2 and shown in Figure 4 below. The coordinates of the approximate centre point of the site are 28°44'44.2202"S 32°1'52.938"E.

Table 2: Coordinates of Property's Boundary

FEATURE	LATITUDE (S)			LONGITUDE (E)		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
Point 1	28°	44'	53,4221"	32°	1'	50,3134"
Point 2	28°	44'	53,1251"	32°	1'	49,2377"
Point 3	28°	44'	53,5931"	32°	1'	50,2075"
Point 4	28°	44'	53,8778"	32°	1'	50,0304"
Point 5	28°	44'	50,2768"	32°	1'	42,568"
Point 6	28°	44'	37,045"	32°	1'	50,7896"
Point 7	28°	44'	41,7084"	32°	2'	0,4535"
Point 8	28°	44'	42,3863"	32°	2'	0,7109"
Point 9	28°	44'	50,1108"	32°	1'	56,7466"
Point 10	28°	44'	52,5822"	32°	1'	55,2108"
Point 11	28°	44'	51,9212"	32°	1'	54,9916"
Point 12	28°	44'	50,5306"	32°	1'	52,1101"
Point 13	28°	44'	53,4221"	32°	1'	50,3134"

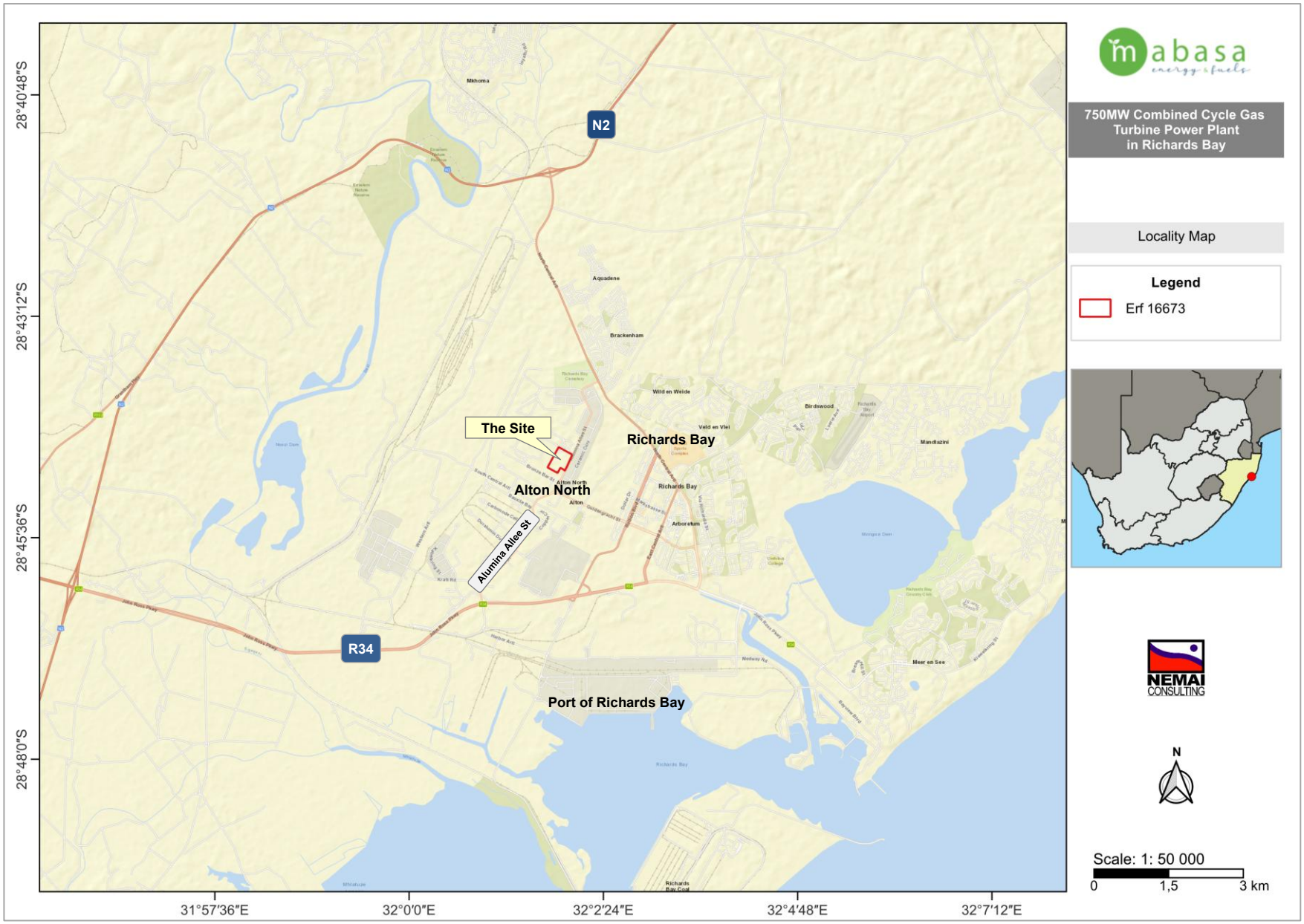


Figure 1: Regional locality map

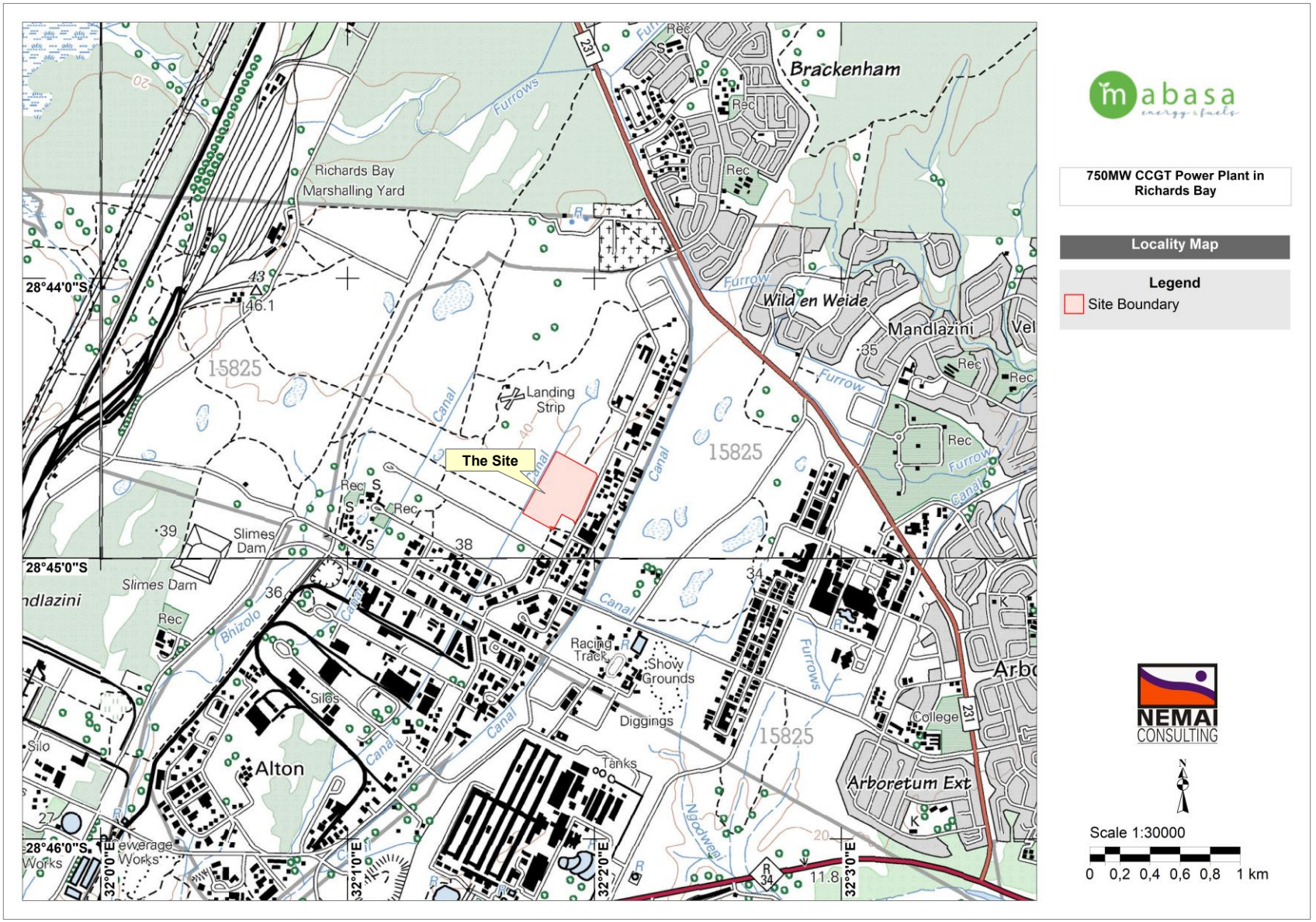


Figure 2: Locality map (topographical map)

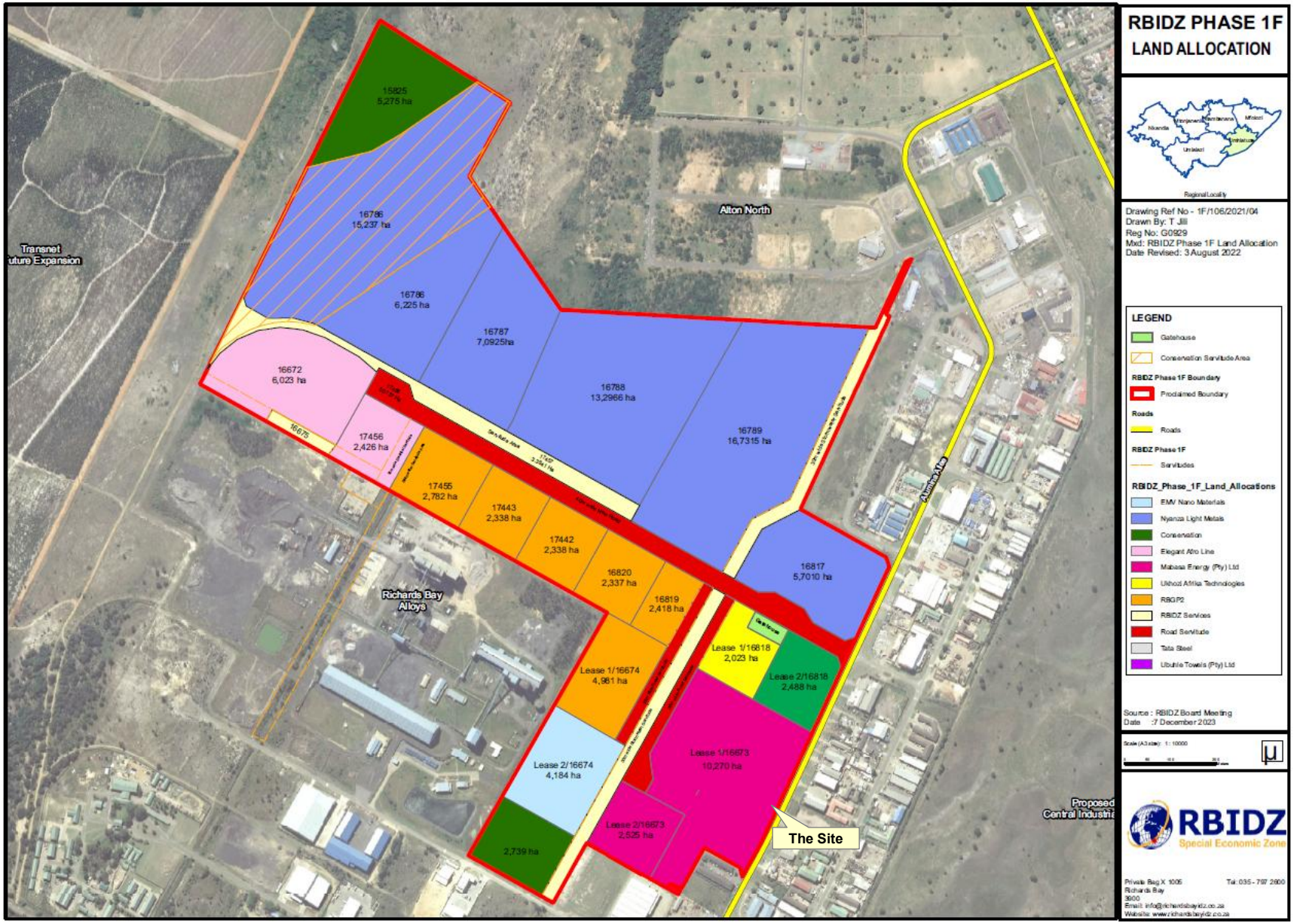


Figure 3: Site location within Phase 1F of the RBIDZ



Figure 4: Aerial view of the proposed site's coordinate points

5 LEGISLATION AND GUIDELINES CONSIDERED

5.1 Legislation

5.1.1 Environmental Statutory Framework

The legislation that has possible bearing on the proposed Project from an environmental perspective is captured in Table 3 below. Note that this list does not attempt to provide an exhaustive explanation but rather represents an identification of some appropriate sections from pertinent pieces of legislation. Additional information on the legislative framework and standards applicable to the various specialist disciplines is provided in the specialist reports contained in **Appendix E**.

Table 3: Overarching environmental statutory framework for the Project

Legislation	Description and Relevance	
National		
Constitution of the Republic of South Africa (No. 108 of 1996)	▪ Chapter 2 – Bill of Rights. ▪ Section 24 – Environmental Rights.	
National Environmental Management Act (Act No. 107 of 1998)	▪ Key sections (amongst others): ○ Section 2 – Principles. ○ Section 24 – Environmental Authorisation (EA) (control of activities which may have a detrimental effect on the environment). ○ Section 28 – Duty of care and remediation of environmental damage. ○ Section 30 – Control of incidents. ▪ Authorisation type – Environmental Authorisation (EA) (*required for the Project*). ▪ Authorities – DFFE (national) (competent authority for this application) and the KZN Department of Economic Development, Tourism & Environmental Affairs (DEDTEA) (provincial).	
EIA Regulations	▪ Purpose - regulate the procedure and criteria as contemplated in Chapter 5 of NEMA relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities, subjected to EIA, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto.	
GN No. 327 of 7 April 2017 (Listing Notice 1)	▪ Purpose – identify activities that would require environmental authorisations prior to commencement of that activity and to identify competent authorities in terms of sections 24(2) and 24D of NEMA. ▪ The investigation, assessment and communication of potential impact of activities must follow a Basic Assessment process, as prescribed in regulations 19 and 20 of the EIA Regulations. However, according to Regulation 15(3) of the EIA Regulations, Scoping and Environmental Impact Reporting (S&EIR) must be applied to an application if the application is for two or more activities as part of the same development for which S&EIR must already be applied in respect of any of the activities. ▪ The following activities under Listing Notice 1 are relevant to this Project:	
	GN R327, Activity 11(ii) *The development of facilities or infrastructure for the transmission and distribution of electricity-* *(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or* *(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more,*	The proposed project entails the development of a 275kV Switchyard comprising of three (3) x 15kV to 275kV step-up transformers and one (1) station auxiliary transformer. However, the power line for the grid connection is excluded from the Application.

Legislation	Description and Relevance	
	excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is- *(a) temporarily required to allow for maintenance of existing infrastructure;* *(b) 2 kilometres or shorter in length;* *(c) within an existing transmission line servitude; and* *(d) will be removed within 18 months of the commencement of development.*	
	GN R327, Activity 13 *The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014.*	Provision is made in the design of the Plant for a freshwater storage reservoir with a capacity of two-day storage, which equals to 50,000 m^3. This reservoir will also cater as fire water source.
	GN R327, Activity 27 *The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-* *(i) the undertaking of a linear activity; or* *(ii) maintenance purposes undertaken in accordance with a maintenance management plan.*	The proposed project is a greenfield development and entails the clearance of indigenous vegetation. The total area encompassed by the earmarked property is 12,7 hectares. It is noted that the site was also previously cleared under the EA for RBIDZ Phase 1F that was granted in Sept 2016 (reference no.: 14/12/16/3/3/2/665). The site is currently undeveloped/vacant and is mowed and maintained by the RBIDZ.
	GN R327, Activity 28(i) *Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:* *(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or* *(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;* *excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.*	The proposed project entails an industrial development on land that was likely used for agriculture in the past. The total area encompassed by the earmarked property is 12,7 hectares. The site is currently undeveloped/vacant and it is zoned for industrial use.
GN No. 325 of 7 April 2017 (Listing Notice 2)	▪ Purpose - identify activities that would require environmental authorisations prior to commencement of that activity and to identify competent authorities in terms of sections 24(2) and 24D of NEMA. ▪ The investigation, assessment and communication of potential impact of activities must follow a S&EIR process, as prescribed in regulations 21 to 24 of the EIA Regulations. ▪ The following activities under Listing Notice 2 are relevant to this Project:	
	GN R325, Activity 2 *The development and related operation of facilities or infrastructure for the generation of electricity from a non-renewable resource where the electricity output is 20 megawatts or more.*	The proposed project entails the development of a CCGT Power Plant with a total generation capacity of 750MW. The Combustion Turbines are capable of firing on a variety of fuels however most commonly natural gas or light distillate oil. The combustion system installed on the units will be configured for natural gas fuel, which is a non-renewable resource.
	GN R325, Activity 4	Construction phase:

Legislation	Description and Relevance	
	The development and related operation of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.	▪ Dangerous goods will be stored on the site during construction, which will include lubricants, oils, etc. Operational phase: ▪ Fire Protection system CO_2 storage: The fire protection system consists of CO_2 delivery from a bottle bank containing approximately 10 tons or 5 100 Nm^3. This CO_2 is delivered to the gas turbines and generator compartments in the event of a fire. The cylinders will be contained in a framed skid that can be relocated using a forklift. The skids are typically equipped with a pressure regulator to decrease the pressure to that required. ▪ Hydrogen cooling system for Generator: This is required to maintain hydrogen pressure inside the generators after the first fill and the operation is controlled by a dedicated hydrogen cooling control panel. The hydrogen will be stored in up to three cylinder banks (one per generator), each containing up to 16 cylinders. The cylinders will be up to 50L in volume and will be at a pressure of 50 bar. The cylinders will be contained in a framed skid that can be relocated using a forklift. The skids are typically equipped with a pressure regulator to decrease the pressure to that required. ▪ Nitrogen for purging and blanketing: This is used for purging of gas lines and equipment before maintenance is carried out so as to purge any dangerous hydrocarbons, typically at startup and after maintenance. It is also used to blanket the HRSG's during maintenance to prevent air ingress which would cause corrosion and the demin water tank to prevent oxygen ingress that results in water quality deterioration. The nitrogen will be stored in cylinder banks, typically at a pressure of 200 bar and will be reticulated around the site as needed. During normal operations, approximately 500 Nm^3 of nitrogen will be stored, but this

Legislation	Description and Relevance	
		may be increased to 1 000 Nm^3 prior to planned maintenance work. ▪ Diesel for backup and black start generators: One, or potentially two, backup diesel generators of up to 1 MW each will used to shut down the plant in a safe and orderly manner in the event of a trip. A black start generator might be required so that the plant can be restarted in the event of total loss of power from the grid. Up to 45 m^3 of diesel will be stored on site in suitably designed and bunded day tanks for these purposes. ▪ Diesel as backup fuel: In the unlikely event that diesel or a similar middle distillate fuel is required to enable operation during NG supply failure events, up to 12 000 m^3 of diesel will be stored on site, in two suitably designed and bunded tanks.
	GN R325, Activity 6 *The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding-* *(i) activities which are identified and included in Listing Notice 1 of 2014;* *(ii) activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies;* *(iii) the development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or* *(iv) where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.*	The proposed project will require an Atmospheric Emission Licence (AEL) in terms of the National Environmental Management: Air Quality Act (Act No. 39 of 2004).
GN No. 324 of 7 April 2017 (Listing Notice 3)	▪ Purpose - list activities and identify competent authorities under sections 24(2), 24(5) and 24D of NEMA, where environmental authorisation is required prior to commencement of that activity in specific identified geographical areas only. ▪ The investigation, assessment and communication of potential impact of activities must follow a Basic Assessment process, as prescribed in regulations 19 and 20 of the EIA Regulations. However, according to Regulation 15(3) of the EIA Regulations, S&EIR must be applied to an application if the application is for two or more activities as part of the same development for which S&EIR must already be applied in respect of any of the activities. ▪ The following activities under Listing Notice 3 are relevant to this Project:	
	GN R324, Activity 4 – (d)(viii) *The development of a road wider than 4 metres with a reserve less than 13.5 metres.* *(d) KwaZulu-Natal*	Internal roads to be developed on the project site will generally be 6m wide. These roads will occur in an area designated as a Critical Biodiversity Area (CBA) Irreplaceable according to the

Legislation	Description and Relevance	
	(viii) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.	KwaZulu-Natal Biodiversity Plan (KZN BP).
	GN R324, Activity 10 – (d)(ix) *The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.* *(d) KwaZulu-Natal* *(ix) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.*	Storage of dangerous goods during construction and operational phases in containers with a combined capacity of up to 80 cubic metres. The storage facilities will be located within an area designated as a CBA Irreplaceable according to the KZN BP.
	GN R324, Activity 12 – (d)(iv) & (v) *The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.* *(d) KwaZulu-Natal* *(iv) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;* *(v) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.*	The proposed project is a greenfield development and entails the clearance of indigenous vegetation in an area designated as a CBA Irreplaceable according to the KZN BP, as well as the Endangered Maputaland Wooded Grassland threatened ecosystem. It is noted that the site was also previously cleared under the EA for RBIDZ Phase 1F that was granted in Sept 2016 (reference no.: 14/12/16/3/3/2/665). The site is currently undeveloped/vacant and is mowed and maintained by the RBIDZ.
National Water Act (Act No. 36 of 1998)	▪ Key sections (amongst others): o Chapter 3 – Protection of water resources. o Section 19 – Prevention and remedying effects of pollution. o Section 20 – Control of emergency incidents. o Chapter 4 – Water use. ▪ Authorisation type – General Authorisation / Water Use Licence (*required for the Project*). ▪ Authority – Department of Water and Sanitation (DWS).	
National Environmental Management: Waste Act (Act No. 59 of 2008)	▪ Key sections (amongst others): o Part 2 – General duty on the holder of waste in respect of waste management. o Part 3 – Reduction, re-use, recycling and recovery of waste. o Part 4 – Regulation of waste management activities. o Part 5 – Storage, collection and transportation of waste. o Part 6 – Treatment, processing and disposal of waste. o Part 8 – Legal mechanism for managing contaminated land. ▪ Authorisation type – Waste Management Licence (*not required for the Project*). ▪ Authority – DFFE (national) and DEDTEA (provincial).	
National Environmental Management Air Quality Act (Act No. 39 of 2004)	▪ Key sections (amongst others): o Chapter 2 – National Framework and National, Provincial and Local Standards. o Chapter 4 – Air Quality Management Measures. o Chapter 5 – Licensing of Listed Activities. ▪ Authorisation type – AEL (*required for the Project*). ▪ Authority – DFFE (national), DEDTEA (provincial) and KCDM (local).	
National Environmental Management: Integrated Coastal Management Act (Act No. 24 of 2008)	▪ Key sections (amongst others): o Section 58 – Duty to avoid causing adverse effects on coastal environment. o Section 63 – Environmental authorisations for coastal activities. o Section 69 – Discharge of effluent into coastal waters. o Section 71 – Dumping permits. ▪ Authorisation types (*none of these are required for the Project*): o Approval for reclamation of land. o Coastal Waters Discharge Permit. o Dumping Permit. ▪ Authority – DFFE Oceans & Coasts.	

Legislation	Description and Relevance
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	▪ Key sections (amongst others): o Section 7 – National environmental management principles. o Section 40 – Bioregions and bioregional plans. o Chapter 4 – Threatened or Protected Ecosystems and Species. o Chapter 5 – Species and Organisms Posing Potential Threats to Biodiversity. o Chapter 7 – Permits. ▪ Authorisation type – Permit (*not required for the Project*). ▪ Authority – Ezemvelo KZN Wildlife (EKZNW).
National Forests Act (Act No. 84 of 1998)	▪ Key sections (amongst others): o Chapter 3 – Special Measures to Protect Forests and Trees. ▪ Authorisation type – Licence (*not required for the Project*). ▪ Authority – DFFE.
National Environmental Management: Protected Areas Act (Act No. 57 of 2003)	▪ Management authorities include the organ of state or other institution or person in which the authority to manage the protected area is vested. ▪ *Not relevant to the Project*.
Climate Change Act (Act No. 22 of 2024)	▪ Enables the development of an effective climate change response and a long-term, just transition to a low-carbon and climate-resilient economy and society for SA in the context of sustainable development; and to provide for matters connected therewith. ▪ Key sections (amongst others): o Section 3 – Principles. o Section 5 – Application of NEMA. o Section 7 – Alignment of policies. o Chapter 4 – National Adaptation to Impacts of Climate Change. o Chapter 5 – Greenhouse Gas Emissions and Removals. ▪ Authority – DFFE.
Minerals and Petroleum Resources Development Act (Act No. 28 of 2002)	▪ Key sections (amongst others): o Section 22 – Application for mining right. o Section 27 – Application for, issuing and duration of mining permit. o Section 53 – Use of land surface rights contrary to objects of Act. ▪ Authorisation types (*none of these are required for the Project*): o Mineral resources – Reconnaissance Permit, Prospecting Right, Mining Permit, or Mining Right. o Petroleum resources – Exploration Right or Production Right. ▪ Authority – DMPR.
National Heritage Resources Act (Act No. 25 of 1999)	▪ Key sections: o Section 34 – protection of structure older than 60 years. o Section 35 – protection of heritage resources. o Section 36 – protection of graves and burial grounds. o Section 38 – Heritage Impact Assessment for linear development exceeding 300m in length; development exceeding 5 000m^2 in extent, etc. ▪ Authorisation type – Permit (*not required for the Project*). ▪ Authority – South African Heritage Resources Agency (SAHRA) and Amafa and Research Institute.
Marine Living Resources Act (Act No 18 of 1989)	▪ Aims to provide for the conservation of the marine ecosystem, the long-term sustainable utilisation of marine living resources, the orderly access to exploitation, utilisation and protection of certain marine living resources and to provide for the exercise of control over marine living resources in a fair and equitable manner to the benefit of all citizens of SA. ▪ Authority – EKZNW acts as an agent on behalf of DFFE Oceans and Coasts and enforces the law with regard to marine matters in KZN.
Conservation of Agricultural Resources Act (Act No. 43 of 1983)	▪ Control measures for erosion. ▪ Control measures for alien and invasive plant species. ▪ Authority – KZN Department of Agriculture and Rural Development (DARD).
Occupational Health & Safety Act (Act No. 85 of 1993)	▪ Provisions for Occupational Health & Safety. ▪ Authority – Department of Employment and Labour (DEL). ▪ Relevant regulations, such as Electrical Installation Regulations, Construction Regulations, etc.
Hazardous Substance Act (No 15 of 1973) and Regulations	▪ Provides for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances, and for the control of certain electronic products ▪ Provides for the division of such substances or products into groups in relation to the degree of danger.

Legislation	Description and Relevance
	▪ Provides for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products.
Major Hazard Installation Regulations, 2023	▪ Ensure that employees as well as the public are protected from Major Hazard Installation (MHI) incidents, which include fire, toxic emissions, as well as confined explosions. ▪ Need tor a MHI Risk Assessment for the Plant. ▪ Authority – DEL.
Spatial Planning and Land Use Management Act (Act No. 16 of 2013)	▪ Framework for spatial planning and land use management in SA. ▪ Land development and land use applications. ▪ Authority – CoU.
Provincial	
KwaZulu-Natal Nature Conservation Management Act (Act No. 9 of 1997)	▪ Institutional bodies for nature conservation in KZN. ▪ Establish control and monitoring bodies and mechanisms. ▪ Authority – EKZNW.
KZN Heritage Act (Act No. 4 of 2008)	▪ Conservation, protection and administration of both the physical and the living or tangible heritage resources of KZN. ▪ Authority – Amafa and Research Institute.

The relationship between the Project and certain key pieces of environmental legislation is discussed in the subsections to follow.

5.1.2 United Nations Framework Convention on Climate Change

The Project must be assessed within the framework of SA's international climate change commitments.

The United Nations Framework Convention on Climate Change (UNFCCC), which was adopted at the Earth Summit in Rio de Janeiro in 1992, is the principal global treaty for coordinating international responses to climate change. SA ratified the UNFCCC on 29 August 1997. The ratification was officially published in Government Gazette No. 18539 on 19 December 1997, under GN 1676. This ratification confirms SA's standing within the international arena as a country that is responsible for environmental management and sustainable development and that commits itself to those parts of the Convention which apply to developing countries. The Convention attempts to achieve the stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.

5.1.3 National Environmental Management Act, 1998

5.1.3.1 Overview

NEMA is the framework legislation regulating the environment in SA. According to Section 2(3) of NEMA, development must be socially, environmentally and economically sustainable, which means the integration of these three factors into planning, implementation and decision-making so as to ensure that development serves present and future generations.

Some key definitions from NEMA include:

- "Environment" - the surroundings within which humans exist and that are made up of –

(i) The land, water and atmosphere of the earth;
(ii) Micro-organisms, plant and animal life;
(iii) Any part or combination of (i) and (ii) and the interrelationships among and between them; and
(iv) The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

- "Pollution" - any change in the environment caused by –
  (i) substances;
  (ii) radioactive or other waves; or
  (iii) noise, odours, dust or heat;
  emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.

Section 2(4)(p) of NEMA requires that costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects are paid for by those responsible for harming the environment.

Section 28(1) of NEMA imposes a duty of care and remediation for environmental damage and requires that "*every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment*".

Section 24 of NEMA provides for the consideration, investigation, assessment and reporting of the potential consequences for, or impacts on, the environment of listed activities (or specified activities) to the Competent Authority. The EIA Regulations were promulgated to regulate the procedure and criteria as contemplated in Section 24 of NEMA relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities, subjected to an EIA, in order to mitigate detrimental impacts on the environment, and to optimise positive environmental impacts. The EIA Regulations were published under GN No. 982 in Gazette No. 38282 of 4 December 2014 and amended by GN 326 of 7 April 2017 published in Gazette No. 40772.

The EIA Regulations, which were published in terms of NEMA, consist of the following:

- GN No. 326 of 7 April 2017 – EIA procedure;
- GN No. 327 of 7 April 2017 (Listing Notice 1) – activities that need to be subjected to a Basic Assessment process, as prescribed in Regulations 19 and 20 of the EIA Regulations;

- GN No. 325 of 7 April 2017 (Listing Notice 2) – activities that need to be subjected to a Scoping and Environmental Impact Reporting (S&EIR) Process, as prescribed in Regulations 21 - 24 of the EIA Regulations; and
- GN No. 324 of 7 April 2017 (Listing Notice 3) – activities in specific identified geographical areas that need to be subjected to a Basic Assessment process, as prescribed in Regulations 19 and 20 of the EIA Regulations.

5.1.3.2 Relevance to the Project

The Project triggers activities under Listing Notices 1, 2 and 3, and thus needs to be subjected to a S&EIR process. The listed activities are explained within the context of the Project in Table 3 above.

An EA was granted by the former Department of Environmental Affairs (DEA), now known as DFFE, for the RBIDZ Phase 1F in Sept 2016 (reference no.: 14/12/16/3/3/2/665). The following components of the development were catered for in the EA (shown in Figure 5 below):

- Water infrastructure;
- Sewer infrastructure;
- Stormwater infrastructure;
- Roads;
- Electrical services; and
- Infilling of wetlands (to enable the development of the site for industrial purposes).

The access road and services required for the proposed Project are thus covered in the EA for the RBIDZ Phase 1F and are not being applied for again. The infilling of the wetland on the site is also excluded from the Project's application.

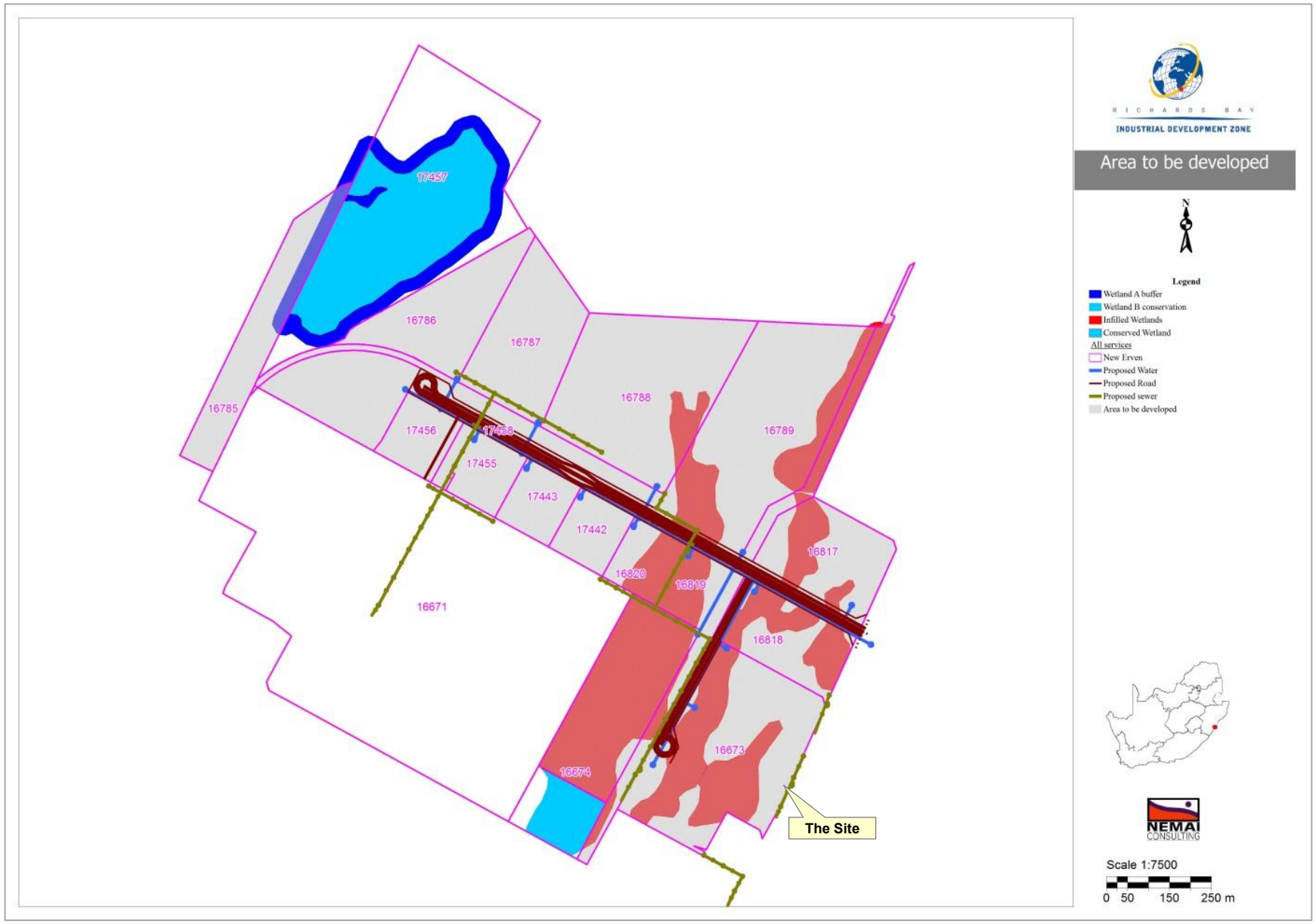


Figure 5: Components of RBIDZ Phase 1F catered for in the EA of 2016 (Nemai Consulting, 2016)

5.1.4 National Water Act, 1998

5.1.4.1 Overview

The purpose of the National Water Act (Act No. 36 of 1998) (NWA) is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account the following:

- Meeting the basic human needs of present and future generations;
- Promoting equitable access to water;
- Redressing the results of past racial and gender discrimination;
- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Providing for growing demand for water use; protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources;
- Meeting international obligations;
- Promoting dam safety; and
- Managing floods and droughts.

Some key definitions from the NWA include:

- “Estuary” – a partially or fully enclosed body of water (a) which is open to the sea permanently or periodically; and (b) within which the sea water can be diluted, to an extent that is measurable, with fresh water drained from land.
- “Pollution” – the direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it (a) less fit for any beneficial purpose for which it may reasonably be expected to be used; or (b) harmful or potentially harmful.
- “Reserve" means the quantity and quality of water required:
  - To satisfy basic human needs by securing a basic water supply, as prescribed under the Water Services Act (Act No. 108 of 1997), for people who are now or who will, in the reasonably near future, be relying upon, taking water from or being supplied from, the relevant water resource; and
  - To protect aquatic ecosystems in order to secure ecologically sustainable development and use of the relevant water resource.
- “Waste” – includes any solid material or material that is suspended, dissolved or transported in water (including sediment) and which is spilled or deposited on land or into a water resource in such volume, composition or manner as to cause, or to be reasonably likely to cause, the water resource to be polluted.
- “Water resource” – includes a watercourse, surface water, estuary, or aquifer.
- “Watercourse” –
  - A river or spring;
  - A natural channel in which water flows regularly or intermittently;
  - A wetland, lake or dam into which, or from which, water flows; and

- Any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.

Section 19 of the NWA deals with pollution prevention, and in particular the situation where pollution of a water resource occurs or might occur as a result of activities on land. The person who owns, controls, occupies or uses the land in question is responsible for taking measures to prevent pollution of water resources.

Section 20 of the NWA deals with pollution of water resources following an emergency incident, such as an accident involving the spilling of a harmful substance that finds or may find its way into a water resource. The responsibility for remedying the situation rests with the person responsible for the incident or the substance involved.

Section 21 of the NWA lists the eleven types of water uses, which include taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation.

5.1.4.2 Relevance to the Project

Section 21(c) water use (*impeding or diverting the flow of water in a watercourse*) and Section 21(i) water use (*altering the bed, banks, course or characteristics of a watercourse*) relate to the encroachments of the Project's proposed infrastructure and activities into the regulated areas of watercourses.

The regulated area of a watercourse for Section 21(c) and (i) water uses is defined as follows in Government Gazette No. 40229 of 26 August 2016:

- 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 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (subject to compliance to Section 144 of the NWA); or
- A 500 m radius from the delineated boundary (extent) of any wetland or pan.

It is noted that various wetlands were infilled in the RBIDZ Phase 1F to allow for the development on these portions of land within the industrial estate (see Figure 6 below), under the requisite approvals in terms of NEMA and NWA. Two wetlands in the RBIDZ Phase 1F were conserved, which are shown in Figure 6 below. The wetland on the project site was partially infilled, whilst a wetland (known as remainder of Wetland B) remains to the south-west of the site. The site is located within 500 m of the last-mentioned wetland, and the proposed development thus encroaches into the regulated area of this watercourse and triggers Section 21(c) and (i) water uses.



Figure 6: Infilled wetlands (red) and conserved wetlands (blue) in the RBIDZ Phase 1F (Nemai Consulting, 2016)

The following definitions apply to Section 21(c) water use, in accordance with Government Gazette No. 40229 of 26 August 2016:

- "Construction" means any works undertaken to initiate or establish impeding or diverting or modifying resource quality, for the first time, including vegetation removal, site preparation and ground levelling;
- "Diverting" means to, in any manner, cause the instream flow of water to be rerouted temporarily or permanently; and
- "Impeding" means to, in any manner, hinder or obstruct the instream flow of water temporarily or permanently, but excludes the damming of flow so as to cause storage of water.

Section 21(i) water use means any change affecting the resource quality of a watercourse, which constitutes the following:

- The quantity, pattern, timing, water level and assurance of instream flow;
- The water quality, including the physical, chemical and biological characteristics of the water;
- The character and condition of the instream and riparian habitat; and
- The characteristics, condition and distribution of the aquatic biota.

The findings of the Freshwater Ecosystem Assessment that was conducted for the Project are contained in 12.6 below.

A Water Use Licence Application (WULA) will be submitted to DWS to seek authorisation in terms of the NWA for the Project's water uses. Furthermore, the Project must comply with all other relevant provisions of the NWA, such as preventing pollution of water resources which is imposed in Section 19 of this Act. Provision is made in the Environmental Management Programme (EMPr) (contained in **Appendix I**) to protect water resources from impacts associated with the Project.

5.1.5 National Environmental Management: Waste Act, 2008

5.1.5.1 Overview

Amongst others, the purpose of the National Environmental Management: Waste Act (Act No. 59 of 2008) (NEM:WA) includes the following:

1. To reform the law regulating waste management in the country by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development;
2. To provide for institutional arrangements and planning matters;
3. To provide for specific waste management measures;
4. To provide for the licensing and control of waste management activities;
5. To provide for the remediation of contaminated land; and
6. To provide for compliance and enforcement.

"Waste" is defined in NEM:WA as "*any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act*".

Schedule 3 of the NEM:WA groups waste into two categories, namely hazardous waste and general waste. The classification of waste determines the associated management and licencing requirements. ''Hazardous waste'' is defined as "*any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles*".

GN No. R. 921 of 29 November 2013 (as amended) contains a list of waste management activities that have, or are likely to have, a detrimental impact on the environment. If any of the waste management activities are triggered in Category A and Category B, a Waste Management Licence is required. Activities listed in Category C need to comply with the relevant National Norms and Standards.

5.1.5.2 Relevance to the Project

No authorisation will be required in terms of NEM:WA, as the Project will not include any listed waste management activities.

The following is noted with regards to waste management for the Project:

- Construction phase –
  - Temporary waste storage facilities will remain below the thresholds contained in the listed activities under Schedule 1 of NEM:WA; and
  - The EMPr (contained in **Appendix I**) makes suitable provision for waste management, including the storage, handling and disposal of waste.
- Operational phase –
  - Minimum waste will be generated during the operational phase; and
  - Waste generated during maintenance works will be disposed of at a licensed waste disposal site.

5.1.6 National Environmental Management: Air Quality Act, 2004

5.1.6.1 Overview

The purpose of the National Environmental Management: Air Quality Act (Act No. 39 of 2004) (NEM:AQA) is to reform the law regulating air quality by providing measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development. This Act aims to promote justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government, and for specific air quality measures.

Some key definitions from this Act include:

- "Air pollution" – any change in the composition of the air caused by smoke, soot, dust (including fly ash), cinders, solid particles of any kind, gases, fumes, aerosols and odorous substances.
- "Atmospheric emission" or "emission" – any emission or entrainment process emanating from a point, non-point or mobile source that results in air pollution.
- "Non-point source" – a source of atmospheric emissions which cannot be identified as having emanated from a single identifiable source or fixed location, and includes veld, forest and open fires, mining activities, agricultural activities and stockpiles.
- "Point source" – single identifiable source and fixed location of atmospheric emission, and includes smoke stacks and residential chimneys.

The National Ambient Air Quality Standards (NAAQS) were established in terms of Section 9 of the NEM:AQA. The NAAQS consists of a 'limit' value and a permitted frequency of exceedance.

Section 21 of the NEM:AQA provides for the listing of activities which result in atmospheric emissions that pose a threat to health or the environment, which are contained in GN 893 of 22

November 2013. No person may without an Atmospheric Emission Licence (AEL) conduct any such listed activity.

National Dust Control Regulations (GN No. R. 827 of 1 November 2013), as amended, were gazetted in terms of NEM:AQA. The purpose of the regulations is to prescribe general measures for the control of dust in all areas. There Regulations prescribe acceptable dust fallout rates.

5.1.6.2 Relevance to the Project

National Ambient Air Quality Standards

The NAAQS for the gaseous emissions associated with the Plant, which include SO_2, NO_2, CO, and fine particulate matter of particulate size <10µm and particulate size <2.5µm in diameter (PM_{10} and $PM_{2.5}$), are listed in Table 4 below.

Table 4: NAAQS for pollutants relevant to the Plant (uMoya-NILU, 2026)

Pollutant	Averaging period	Limit value (µg/m^3)	Tolerance
SO_2	1-hour	350	88
	24-hour	125	4
	Annual	50	0
NO_2	1-hour	200	88
	Annual	40	0
PM_{10}	24-hour	75	4
	Annual	40	0
$PM_{2.5}$	24-hour	40	4
	Annual	20	0
CO	1-hour	30 000	88
	8-hour running mean	10 000	11

CO_2 is a Greenhouse Gas and ambient air quality standards do not apply. However, it is a priority pollutant (DEA, 2016 as cited in uMoya-NILU, 2026). Emissions must be accounted for and reported to the relevant Authorities.

Listed Activity & Minimum Emission Standards

As a measure to reduce emissions from industrial sources and to improve ambient air quality, Listed Activities and associated Minimum Emission Standards (MES) were initially published in 2010 in Government Notice 248 (DEA, 2010) with the most recent revision applicable in 2019 (Government Notice 867, DEA, 2019).

With a generation capacity exceeding 50 MW the details of the Listed Activity are shown in Table 5 below. The MES for the Listed Activity sub-category triggered by the Project are listed in Table 6.

Table 5: Details of the Listed Activity triggered by the proposed Project according to GN 248 (DEA, 2010) and its revisions (DEA, 2013c, 2019)

Category of Listed Activity	Sub-category of the Listed Activity and Description	Application of the Listed Activity
Category 1: Combustion Installations	Sub-category 1.4: Gas combustion (including gas turbines burning natural gas) used primarily for steam raising or electricity generation	All installations with design capacity equal to or greater than 50 MW heat input per unit, based on the lower calorific value of the fuel used

Table 6: MES for Category 1 Listed Activities according to GN 248 (DEA, 2010) and its revisions (DEA, 2013c, 2019)

Substance or mixture of substances		Minimum Emission Standards (mg/Nm^3) under normal conditions of 15% O_2, 273 Kelvin and 101.3 kPa.
Common name	Chemical symbol	
1.4: Gas combustion installation		
Particulate matter	N/A	10
Sulphur dioxide	SO_2	400
Oxides of nitrogen	NO_X	50

a: expressed as NO_2

Specialist Studies

A Climate Change Impact Assessment and Air Quality Impact Assessment were undertaken for the Project and the findings are included in Section 12.4 and Section 12.5 below, respectively. The Air Quality Impact Assessment was compiled in support of the AEL application and adheres to regulated requirements of an Atmospheric Impact Report (AIR).

A meeting was held with DFFE's Air Quality and Climate Change Units on 1 March 2024 in order to determine DFFE's requirements from the Air Quality Impact Assessment and Climate Change Impact Assessment, as well as to confirm DFFE's requirements for the AEL and how it needs to align with the S&EIR Process. The notes from this meeting were contained in the Scoping Report.

5.1.7 National Environmental Management: Biodiversity Act, 2004

5.1.7.1 Overview

The purpose of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEM:BA) is to provide for the management and conservation of SA's biodiversity within the framework of NEMA.

Some key definitions from the NEM:BA include:

- "Alien species" –
  - A species that is not an indigenous species; or

  - An indigenous species translocated or intended to be translocated to a place outside its natural distribution range in nature, but not an indigenous species that has extended its natural distribution range by natural means of migration or dispersal without human intervention.
- "Biological diversity" or "biodiversity" – the variability among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems.
- "Indigenous species" – a species that occurs, or has historically occurred, naturally in a free state in nature within the borders of the Republic, but excludes a species that has been introduced in the Republic as a result of human activity.
- "Invasive species" – any species whose establishment and spread outside of its natural distribution range -
  - Threaten ecosystems, habitats or other species or have demonstrable potential; and
  - May result in economic or environmental harm or harm to human health.
- "Species" – a kind of animal, plant or other organism that does not normally interbreed with individuals of another kind, and includes any sub-species, cultivar, variety, geographic race, strain, hybrid or geographically separate population.

The NEM:BA allows for the publication of provincial and national lists of ecosystems that are threatened and in need of protection. The list should include:

- Critically Endangered Ecosystems, which are ecosystems that have undergone severe ecological degradation as a result of human activity and are at extremely high risk of irreversible transformation.
- Endangered Ecosystems, which are ecosystems that, although they are not critically endangered, have nevertheless undergone ecological degradation as a result of human activity.
- Vulnerable Ecosystems, which are ecosystems that have a high risk of undergoing significant ecological degradation.
- Protected Ecosystems, which are ecosystems that are of a high conservation value or contain indigenous species at high risk of extinction in the wild in the near future.

Similarly, the NEM:BA allows for the listing of endangered species, including critically endangered species, endangered species, vulnerable species and protected species. A person may not carry out a restricted activity (including trade) involving listed threatened or protected species without a permit.

The Regulations on the management of Listed Alien and Invasive Species were promulgated on 1 August 2014. The Listed Invasive Species were also published on this date and were subsequently amended in GN 864 of 29 July 2016.

5.1.7.2 Relevance to the Project

The implications of NEM:BA for the Project *inter alia* include the requirements for managing invasive and alien species, protecting threatened ecosystems and species, as well as for rehabilitating the areas affected by the Project (outside of the development's physical footprint).

A Freshwater Ecosystem Assessment and Terrestrial Biodiversity Assessment and were undertaken for the Project and the findings are included in Section 12.6 and Section 0 below, respectively.

5.1.8 National Heritage Resources Act, 1999

5.1.8.1 Overview

The purpose of the National Heritage Resources Act (Act No. 25 of 1999) (NHRA) is to protect and promote good management of SA's heritage resources, and to encourage and enable communities to nurture and conserve their legacy so it is available to future generations.

Some key definitions from this Act include:

- ''Cultural significance'' – aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.
- ''Development'' – any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of a heritage authority in any way result in a change to the nature, appearance or physical nature of a place, or influence its stability and future well-being, including -
  - Construction, alteration, demolition, removal or change of use of a place or a structure at a place;
  - Carrying out any works on or over or under a place;
  - Subdivision or consolidation of land comprising, a place, including the structures or airspace of a place;
  - Constructing or putting up for display signs or hoardings;
  - Any change to the natural or existing condition or topography of land; and
  - Any removal or destruction of trees, or removal of vegetation or topsoil.
- ''Heritage resource'' – any place or object of cultural significance.

In terms of Section 38 of the NHRA, certain listed activities require authorisation from provincial agencies, which include the following:

- The construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- The construction of a bridge or similar structure exceeding 50m in length;
- Any development or other activity which will change the character of a site exceeding 5 000 m^2 in extent, or involving three or more existing erven or subdivisions thereof; and
- The re-zoning of a site exceeding 10 000 m^2 in extent.

The KZN Amafa and Research Institute is the provincial heritage resources authority and is mandated by the KZN Heritage Act (Act No. 4 of 2008).

5.1.8.2 Relevance to the Project

Some key findings of the Heritage Site Sensitivity Verification (SSV) (refer to report contained in the Scoping Report) that was undertaken by a specialist include the following (Nitai Consulting, 2024):

- The earliest edition (and subsequent editions) of the historical topographic map sheets of the study area depict no heritage features or structures on the site; and
- The Heritage Impact Assessment that was undertaken as part of the EIA for the RBIDZ Phase 1F found no significant heritage resources within the greater industrial estate. Several other HIA reports for areas in the immediate vicinity of the current project area were also reviewed.

An Application for Exemption from preparing a Heritage Impact Assessment (contained in **Appendix G**) was submitted to KZN Amafa and Research Institute. In response, the KZN Amafa and Research Institute issued a No Objection Letter (contained in **Appendix G**), which states that the Project is exempted from a further Full Phase 1 Heritage Impact Assessment, and that only a chance find protocols will apply.

The findings of the Palaeontological Desktop Assessment that was conducted for the Project are contained in Section 12.13 below.

5.2 Guidelines

The following guidelines were considered during the preparation of the EIA Report:

- Integrated Environmental Management Information Series, in particular Series 2 – Scoping (DEAT, 2002);
- Guideline on Alternatives, EIA Guideline and Information Document Series (DEA&DP, 2010);
- Guideline on Need and Desirability (DEA, 2017); and
- Guidelines for Involving Specialists in the EIA Processes Series (Brownlie, 2005).

5.3 National and Regional Plans

The following regional plans were considered during the execution of the EIA (amongst others):

- KwaZulu-Natal Biodiversity Plan (KZN BP);
- CoU Spatial Development Frameworks (SDF);
- CoU Integrated Development Plan (IDP);
- uThungulu Biodiversity Sector Plan (BSP);
- Environmental Management Framework (EMF) for RBIDZ and Port Expansion; and
- Relevant national, provincial and local policies, strategies, plans and programmes.

6 SCOPING AND ENVIRONMENTAL IMPACT REPORTING PROCESS

6.1 Competent Authority

According to GN 779 of 1 July 2016, the Minister of Environmental Affairs is the Competent Authority for the consideration and processing of environmental authorisations and amendments thereto for activities related to the IRP 2010-2030. Hence, the application for EA was submitted to DFFE.

Various other authorities with jurisdiction over elements of the receiving environment or project activities (refer to Section 5.1 above) are also being consulted during the course of the EIA. Refer to the database of Interested and Affected Parties (I&APs) contained in **Appendix H** for a list of the government departments.

6.2 Environmental Assessment Practitioner

Nemai Consulting was appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the S&EIR Process for the proposed Project. The CV and oath of the EAP are contained in **Appendix J** and **Appendix C**, respectively.

6.3 Environmental Screening

According to GN 960 of 5 July 2019, an application for EA must be accompanied by a report generated by the National Web Based Environmental Screening Tool ("Screening Tool"), as contemplated in Regulation 16(1)(b)(v) of the EIA Regulations.

The aims of the Screening Tool include the following:

- To screen a proposed site for any environmental sensitivity;
- To provide site specific EIA process and review information;
- To identify related exclusions and/or specific requirements including specialist studies applicable to the proposed site and/or development, based on the national sector classification and the environmental sensitivity of the site; and
- To allow for a Screening Report to be generated.

The Screening Report for the proposed Project was appended to the Application Form that was submitted to DFFE. The results of the Screening Tool were considered further during the specialist studies that were undertaken for the Project.

6.4 Environmental Assessment Triggers

The process for seeking EA under NEMA is being undertaken according to the EIA Regulations, promulgated in terms of Chapter 5 of NEMA. Based on the types of activities involved the requisite environmental assessment for the Project is a S&EIR Process. Refer to Section 5 above for the Project's legal framework and specifically the activities triggered in terms of Listing Notices 1, 2 and 3 of the EIA Regulations.

6.5 S&EIR Process

6.5.1 Formal Process

An outline of the S&EIR Process for the proposed Project is provided in Figure 7 below. The objectives of the EIA Phase, based on the EIA Regulations, are captured in Section 1 above.

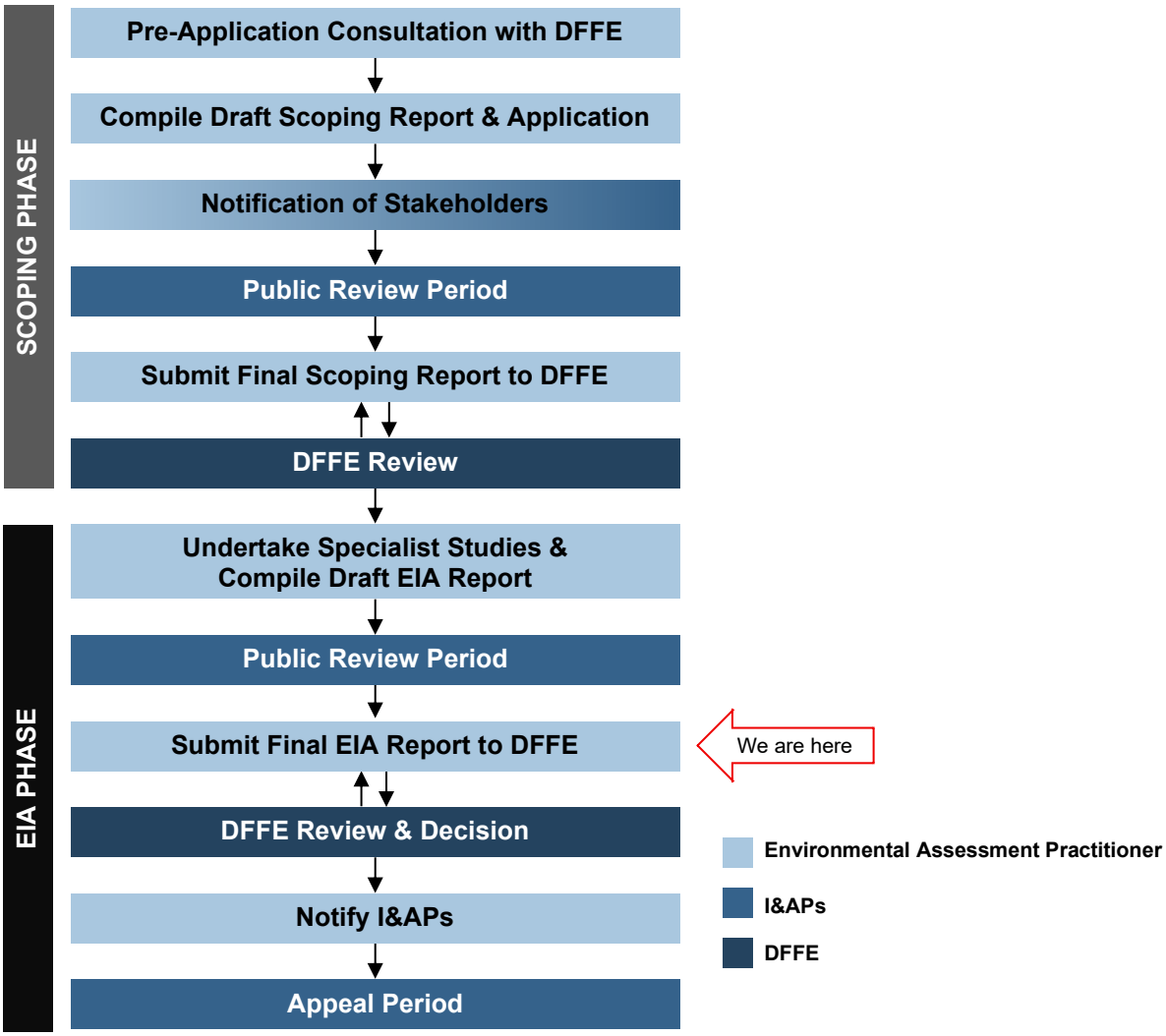


Figure 7: S&EIR Process outline

6.5.2 The EIA Process to Date

The following key milestones have been reached to date as part of the EIA process:

1. A Pre-Application Meeting was held with DFFE on 8 February 2024.
2. A Draft Scoping Report, which conformed to Appendix 2 of the EIA Regulations, was compiled. This document included the following salient information (amongst others):
   a. A Scoping-level impact assessment to identify potentially significant environmental issues for detailed assessment during the EIA phase;
   b. Screening and investigation of feasible alternatives to the Project; and
   c. A Plan of Study, which explained the approach to be adopted to conduct the Environmental Impact Reporting phase.
3. The Application for EA and Draft Scoping Report were submitted to DFFE on 5 March 2026.
4. The Draft Scoping Report was lodged for public review from 6 March until 8 April 2026.
5. The Final Scoping Report was submitted to DFFE on 21 April 2026.
6. DFFE accepted the Scoping Report and Plan of Study for the EIA on 1 June 2026 (refer to **Appendix B**), which allowed the commencement of the Environmental Impact Reporting phase.
7. The draft EIA Report was lodged for public review from 6 August until 7 September 2026.

6.5.3 Landowner Consent & Landowner Notification

According to Regulation 39(1) of the EIA Regulations, if the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an EA in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land. This requirement does not apply *inter alia* for linear developments (e.g., pipelines, power lines, roads) or if it is a SIP as contemplated in the Infrastructure Development Act, 2014.

As mentioned, the Project is located within Phase 1F of the RBIDZ under a long-term lease agreement. Due to its designated SIP status, landowner consent is not required for the Project. Landowner consent was previously provided by the RBIDZ for the development, prior to the project obtaining SIP status, which is contained in the Scoping Report.

6.5.4 Alignment with the Plan of Study

The Plan of Study, which was contained in the Scoping Report and was accepted by DFFE, explained the approach to be adopted to conduct the Environmental Impact Reporting phase for the proposed Project.

The manner in which the EIA Report addresses the requirements of the Plan of Study is shown in Table 7 below.

Table 7: Alignment of EIA Report with Plan of Study

No.	Plan of Study Requirement	Reference to Section in EIA Report
1.	Assess potentially significant environmental issues identified during Scoping through: 1. Applying an appropriate impact assessment methodology. 2. Conducting specialist studies. 3. Identifying suitable mitigation measures.	• Section 12 • Section 13
2.	Assessment of feasible alternatives.	Section 10
3.	Specialist studies to be completed in accordance with Terms of Reference.	• Section 12 • Appendix E
4.	Public participation to include the following: • Update the database of I&APs. • Allow for the review of the Draft EIA Report. • Compile and maintain a Comments and Responses Report (CRR). • Notification of DFFE's decision.	Section 14
5.	EIA Report to satisfy the minimum requirements stipulated in Appendix 3 of the EIA Regulations.	Section 2
6.	Authority Consultation.	Section 14

6.5.5 Addressing DFFE's Requirements - Acceptance of the Scoping Report

The manner in which DFFE's specific requirements, as listed in the letter received from this Department for the acceptance of the Scoping Report (refer to **Appendix B**), have been attended to are described in Table 8 below.

Table 8: DFFE's specific requirements - acceptance of the Scoping Report

No.	Plan of Study Requirement	Reference to Section in EIA Report
a)	Listed Activities	
(i)	The EIAr must provide an assessment of the impacts and mitigation measures for each of the listed activities applied for.	The potential impacts associated with the listed activities triggered by the Project are assessed in Section 13.
(ii)	The listed activities represented in the EIAr, and the application form must be the same and correct.	The listed activities in the Application Form and EIA Report are the same. It is noted that GN R325, Activity 4 also includes a reference to the summary of hazardous materials listed in Table 22 below. *To ensure full alignment between the Application Form and the EIA Report, an amended Application Form, subsequently included as **Appendix L** to this Final EIA Report, was prepared to reflect the same wording used in the EIA Report for GN R325, Activity 4.*
(iii)	Please also ensure that the potential impacts on the affected Critical Biodiversity Areas indicated in Listing Notice 3 are fully assessed in the EIAr.	The potential impacts of the Project on CBAs are assessed in the Terrestrial Biodiversity Assessment (contained in **Appendix E4**).
b)	Public Participation	
(i)	Please ensure that comments from all relevant stakeholders are submitted to the Department with the EIAr. This includes but is not limited to the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs; the relevant Atmospheric Emissions Licence (AEL) Authority, the KwaZulu-	These stakeholders listed in DFFE's comments were notified of the review of the Draft EIA Report and were provided a link to download the report.

No.	Plan of Study Requirement	Reference to Section in EIA Report
	Natal Department of Agriculture and Rural Development; the KwaZulu-Natal Department of Transport; the Department of Water and Sanitation; the Department of Mineral and Petroleum Resources; this Department's Biodiversity and Conservation, Climate Change, and Air Quality Directorates; Transnet; Eskom; the Richards Bay Industrial Development Zone (RBIDZ); Ezemvelo KZN Wildlife, The KwaZulu-Natal Amafa and Research Institute; SANRAL and the relevant District and Local Municipalities.	
(ii)	Please ensure that all issues raised, and comments received on the draft Scoping Report and draft EIAr from registered I&APs and organs of state which have jurisdiction in respect of the proposed activity are adequately addressed in the final EIAr. Proof of correspondence with the various stakeholders must be included in the final EIAr. Should you be unable to obtain comments, proof must be submitted to the Department of the attempts that were made to obtain comments. The Public Participation Process must be conducted in terms of Regulations 39, 40, 41, 42, 43 & 44 of the EIA Regulations 2014, as amended.	The Public Participation Process is being undertaken in accordance with Chapter 6 of the EIA Regulations. The EIA Report aims to address comments received on the Draft Scoping Report. The Final EIA Report will include the following information related to public participation: • Proof of Notification; • Copies of Comments Received on the Draft EIA Report; and • CRR.
(iii)	A comments and response trail report (C&R) must be submitted with the final EIAr. The C&R report must incorporate all comments (pre-submission and post-submission of the draft EIAr) received for this development. The C&R report must be a separate document from the main report, and the format must be in the table format which reflects the details of the I&APs and date of comments received, actual comments received, and response provided. Please ensure that all comments made by I&APs are comprehensively captured (copy verbatim if required) and responded to clearly and fully (i.e., each and every bullet point raised). Please note that a response such as "Noted" is not regarded as an adequate response to I&APs comments.	The CRR was updated with all comments received on the Draft EIA Report. This updated CRR is appended to the Final EIA Report.
c)	Alternatives	
(i)	Please ensure that the EIAr includes a description of each of the preferred alternative types and provides detailed motivation on why they are preferred. If no alternative locations for the activity were investigated, please motivate for not considering such.	The alternatives related to the Project are presented and assessed in Section 10.
(ii)	The identification and assessment of alternatives must also include the transportation routes to be used for the proposed development. The relevant authorities must be consulted in the identification of these routes.	During the construction phase, the proposed Project will utilise the existing RBIDZ road network and established access points to the site. Detailed transportation routes for abnormal and oversized loads will be determined during the detailed engineering and procurement phase in consultation with the relevant road authorities, including the RBIDZ, CoU, KZN Department of Transport, and SANRAL (where applicable).
d)	Project Scope and Coordinates	

(i)	The EIAr must provide the following:
	• Clear indication of the envisioned area for the proposed Gas to Power facility, as well as all associated infrastructure should be mapped at an appropriate scale.
	• Clear description of all associated infrastructure (locations, lengths, widths and/or capacities). This description must include, but is not limited to the following:
	  ○ Ancillary infrastructure; and
	  ○ Electrical and service infrastructure forming part of the application.
		Refer to the layout map contained in Figure 11 as well as the detailed engineering layout in **Appendix A**.
		
		Details of the project components are provided in Section 9 below.
		
		Note the following:
		• This application excludes the development of the grid connection infrastructure.
		• The services required for the Project are discussed in Section 9.8 below.

No.	Plan of Study Requirement	Reference to Section in EIA Report
(ii)	The EIAr must provide the corner coordinate points for the proposed development site, as well as the start, middle and end point of any linear activities.	The coordinates of the property's boundaries are provided in Table 2 and shown in Figure 4 above.
e)	Layout & Sensitivity Maps	
(i)	A copy of the preferred layout map. All available biodiversity information must be used in the finalisation of the layout map. Existing infrastructure must be used as far as possible e.g. roads. The layout map must indicate the following: • Permanent laydown area footprint; • Internal roads / Access roads indicating width and length; • Wetlands, drainage lines, rivers, streams and water crossing if any; • The location of sensitive environmental features on-site e.g. CBAs, heritage sites, wetlands, drainage lines etc. that will be affected by the facility and its associated infrastructure; • Substation(s) and/or transformer(s) sites including their entire footprint; • Location of access and service roads; • All existing infrastructure on the site, especially roads and railway lines; • Buffer areas; • Buildings, including accommodation; and • All "no-go" areas.	Refer to the sensitivity map contained in Section 15.2 below.
(ii)	An environmental sensitivity map indicating environmentally sensitive areas and features identified during the assessment process e.g., CBAs, heritage sites, wetlands, drainage lines etc. that will be affected by the facility and its associated infrastructure.	Environmental sensitivity maps are provided in Section 11 (profiles of the receiving environment) and Section 12 (summaries of specialist studies).
(iii)	A map combining the final layout map superimposed (overlain) on the environmental sensitivity map.	Refer to the sensitivity map contained in Section 15.2 below.
f)	Specialist assessments	
(i)	Specialist studies to be conducted must provide a detailed description of their methodology, as well as indicate the locations and descriptions of the development footprint, and all other associated infrastructures that they have assessed and are recommending for authorisations.	This information is contained in the Specialists' Report – refer to **Appendix E**.
(ii)	The specialist studies must also provide a detailed description of all limitations of their studies. All specialist studies must be conducted in the right season and providing that as a limitation, will not be accepted.	The limitations associated with the specialist studies are listed in Section 7 below. Although the survey for the Terrestrial Biodiversity Assessment was not conducted during the optimal flowering season, it is noted that the EA that was previously granted for the RBIDZ Phase 1F (reference no.: 14/12/16/3/3/2/665) includes the listed activity related to the clearance of indigenous vegetation. The site is currently undeveloped/vacant and is mowed and maintained by the RBIDZ.
(iii)	Please note that the Department considers a 'no-go' area as an area where no development of any infrastructure is allowed; therefore, no development of associated infrastructure including access roads is allowed in the 'no-go' areas.	The same interpretation of 'no-go' areas was applied during the EIA. Refer to the sensitivity map contained in Section 15.2 below.
(iv)	Should the specialist definition of 'no-go' area differ from the Department's definition; this must be clearly indicated. The specialist must also indicate the 'no-go' area's buffer if applicable.	
(v)	All specialist studies must be final, and provide detailed/practical mitigation measures for the preferred alternative and recommendations, and must not recommend further studies to be completed post EA.	No further studies are recommended after the EIA. However, certain mitigation measures include the involvement of specialists.
(vi)	Should the appointed specialists specify contradicting recommendations, the EAP must clearly indicate the most reasonable recommendation and substantiate this with defendable reasons; and were necessary, include further expertise advice.	The specialists did not provide contradictory recommendations.

No.	Plan of Study Requirement	Reference to Section in EIA Report
(vii)	It is further brought to your attention that Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation, which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. "the Protocols"), and in Government Notice No. 1150 of 30 October 2020 (i.e. protocols for terrestrial plant and animal species), have come into effect. Please note that specialist assessments must be conducted in accordance with these protocols. Please indicate whether the protocols were applied.	The Protocols were adhered to by the specialists, as relevant.
(viii)	Please note that the protocols require certain specialists to be SACNASP registered. As such, the Specialist Declaration of Interest forms must also indicate the scientific organisation registration/member number and status of registration/membership for each specialist.	The relevant specialists that undertook the studies are registered with SACNASP. See Specialists' Declarations contained in **Appendix E17**.
(ix)	Please note that if any of the specialist studies and requirements/protocols recommended in the Department's Screening Tool are not commissioned, motivation for such must be provided in the report, inclusive of the necessary site sensitivity verification reports and specialist compliance statements.	Refer to Section 12.1.1 below for a description of the relevance of specialist studies identified in the Screening Report to the Project. The SSV Report was appended to the Scoping Report, which was accepted by DFFE. The SSV Report is also included in **Appendix M**.
(x)	The terms of reference for the Climate Change Impact Assessment must assess the impacts of the development on climate change and vice versa and accordingly must consider both mitigation and adaptation measures to climate change.	This was undertaken as part of the Climate Change Impact Assessment (refer to report contained in **Appendix E1**).
g)	Cumulative Assessment	
(i)	Regarding cumulative impacts: • Clearly defined cumulative impacts and where possible the size of the identified impact must be quantified and indicated, i.e., hectares of cumulatively transformed land. • A detailed process flow must be provided to indicate how the specialist's recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project. • Identified cumulative impacts associated with the proposed development must be rated with the significance rating methodology used in the process. • The significance rating must also inform the need and desirability of the proposed development. • A cumulative impact environmental statement must be provided on whether the proposed development must proceed.	Cumulative impacts associated with the Project are assessed in Section 13.27 below.
h)	General	
(i)	The EIAr must provide the technical details for the proposed facility in a table format as well as their description and/or dimensions.	Details of the project components are provided in Section 9 below.
(ii)	Confirmation of the availability of services (e.g., sewage, water etc. if required) must be included in the EIAr.	Refer to the letter from the RBIDZ regarding the availability of services for the proposed Plant, which is contained in **Appendix D**.
(iii)	Should a Water Use License be required, proof of application for a license needs to be submitted.	The process to apply for authorisation of the Project's water uses, in terms of the NWA, will be applied for via DWS' Electronic Water Use Licence Application and Authorisation System.
(iv)	Details of the future plans for the site and infrastructure after decommissioning in 20-30 years and the possibility of upgrading the proposed infrastructure to more advanced technologies must be indicated.	The Plant has been designed for an operation period of 25-30 years, although all major components can be replaced /

No.	Plan of Study Requirement	Reference to Section in EIA Report
		maintained to allow for last indefinite operation. It is envisaged that the scheme will be used indefinitely, under suitable maintenance. Decommissioning is thus not considered applicable at this stage.

7 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations accompany the S&EIR Process:

- As the design of the project components is still in feasibility stage, and due to the dynamic nature of the planning environment, the dimensions and layout of the infrastructure may change during the detailed design phase.
- Regardless of the analytical and predictive method employed to determine the potential impacts associated with the Project, the impacts are only predicted on a probability basis. The accuracy of the predictions is largely dependent on the availability of environmental data and the degree of understanding of the environmental features and their related attributes.
- The following assumptions, gaps and limitation were noted as part of the Specialist Studies:
  - Freshwater Ecosystem Assessment (SAS, 2026) –
    - An EA was granted by the former DEA, now the DFFE, for the RBIDZ Phase 1F development in September 2016 (Reference No.: 14/12/16/3/3/2/665). The authorised development included the following infrastructure components: water infrastructure, sewer infrastructure, stormwater infrastructure, roads, electrical services, and the infilling of wetlands to facilitate industrial development. The access roads and associated services required for the proposed project are therefore already covered under the existing EA and do not form part of the current application. Importantly, the infilling of wetlands within the site has also been authorised under the existing EA and is excluded from the present assessment. As such, impacts to freshwater ecosystems from the authorised infilling are not assessed as part of this report. However, for completeness and to inform the broader ecological context of the site, baseline information relating to the freshwater habitats present within the study area has been included.
    - All freshwater ecosystems associated with the proposed Project were ground-truthed, however freshwater ecosystems within 500 m of the proposed site were delineated in fulfilment of GN 4167 of the NWA using various desktop methods including use of topographic maps, historical and current digital satellite imagery and aerial photographs. Desktop delineations were ground-truthed where feasible.
    - Due to presence of various activities and disturbances in the area, such as vegetation clearing, for development of surface infrastructure such as includes service buildings and roads, vegetation was not always a reliable indicator of the presence of freshwater ecosystems throughout the areas assessed. As such, in highly disturbed areas, the vegetation indicator may have affected the accuracy of the delineation. Under such circumstances satellite imagery was used to improve accuracy of the delineations.
    - Global Positioning System (GPS) technology is inherently inaccurate and some inaccuracies due to the use of handheld GPS instrumentation may occur. If more accurate assessments are required, the freshwater ecosystems will need to be surveyed and pegged according to surveying principles and with survey equipment.

- With regards to data sources used to provide background information on the sensitivity of the assessed areas, it is important to note that although all data sources provide useful and often verifiable, high-quality data, the various databases used do not always provide an entirely accurate indication of the study area's actual site characteristics at the scale required to inform the environmental authorisation process;
- Wetland, riparian and terrestrial ecosystem zones create transitional areas where an ecotone is formed as vegetation species change from terrestrial to obligate/facultative species. Within this transition zone, some variation of opinion on the freshwater ecosystem boundary may occur. However, if the Department of Water Affairs and Forestry (DWAF) (2008) 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. A more reliable assessment of the biota would require seasonal sampling, with sampling being undertaken under both low flow and high flow conditions. However, it is expected that the existing activities have been accurately assessed and considered, based on the field observations and the consideration of existing studies and monitoring data in terms of aquatic, riparian and wetland ecology.

- Terrestrial Biodiversity Assessment (STS, 2026a) –
  - The biodiversity desktop assessment is confined to the study area and does not include detailed results of the adjacent properties, although ecological important or sensitive areas according to the desktop databases of surrounding areas and the greater project area have been included on the relevant maps.
  - The infilling of wetlands within the site has also been authorised under the existing EA and is excluded from the present assessment. All wetlands within the study area, will be infilled to allow for development as per the EA granted in 2016 (Ref 14/12/16/3/3/2/665).
  - The DFFE Screening Tool provides names of Sensitive Species likely to be present within the study area and its surrounds. Within the screening tool outcome, the names of some species are not provided. These species are rather assigned a number keeping them unidentifiable (e.g., Sensitive Species 1). This procedure is followed because of the vulnerability of the species to threats such as illegal harvesting and overexploitation. According to the best practice guidelines provided by the SANBI, the identity of Sensitive Species may not appear in the EIA report nor any of the specialist reports released into the public domain. However, the conservation threat status of such species has been provided.
  - It is important to note that although all data sources used provide useful and often verifiable, high-quality data, the various databases used do not always provide an entirely accurate indication of the assessed area's actual site characteristics at the scale required to inform more intricate planning, e.g., at the scale needed for an EA. Nevertheless, this information is useful as background information to the study and is important in legislative contextualisation of risk and impact and was used as a guideline

to inform the biodiversity assessment (refer also to Parts B and C of the Terrestrial Biodiversity Assessment Report), and to focus on areas and aspects of increased conservation importance. It must, however, be noted that site assessment of key areas may potentially contradict the information contained in the relevant databases, in which case the site verified, ground-truthed information must carry more weight in the decision-making process.

- Floral Assessment (STS, 2026b) –
  - The results of the floral field assessment presented in this report are limited to data gathered for the study area. The immediate surroundings do not form part of this assessment but were included in the desktop analysis, of which the results are presented in Part A.
  - Sampling, by its nature, means that not all individuals are assessed and identified. Given the dynamic and complex nature of ecology, some aspects (some of which may be important) may have been overlooked. Nevertheless, given the experience of the specialist within the Maputaland Wooded Grassland (the reference state), the survey was deemed sufficient for drawing adequate conclusions regarding the ecological condition and sensitivity of the various habitats therein.
  - The identities of some floral species of conservation concern (SCC) will not be disclosed in this report, although their potential occurrence within the study area was still evaluated. According to the best practice guideline accompanying the DFFE's Screening Tool and the Species Environmental Assessment Guidelines (SANBI, 2020) (as cited in STS, 2026b), the names of sensitive species may not appear in any of the specialist reports that would be publicly available. Such species will be referred to as sensitive plants, with their threat status included.
  - An EA was granted by the former DEA, now the DFFE, for the RBIDZ Phase 1F development in September 2016 (Reference No.: 14/12/16/3/3/2/665). The authorised development included the following infrastructure components: water infrastructure, sewer infrastructure, stormwater infrastructure, roads, electrical services, and the infilling of wetlands to facilitate industrial development. The access roads and associated services required for the proposed project are therefore already covered under the existing EA and do not form part of the current application. Importantly, the infilling of wetlands within the site has also been authorised under the existing EA and is excluded from the present assessment. As such, impacts to freshwater ecosystems are not assessed as part of this report. However, for completeness and to inform the broader ecological context of the site, baseline information relating to the freshwater habitats present within the study area has been included.
  - The floral assessment took place on 13 June 2024 (winter season), which falls outside of the suitable period for vegetation assessments in KZN and the greater savanna biome. Furthermore, this period does not coincide with the optimal flowering periods of the SCCs triggered by the Screening Tool. As a result, particular attention was given to habitat characteristics and site conditions to assess the potential suitability of the study area to support these species, where direct detection may have been limited by

seasonal factors. *Note: Although the floral survey was not conducted during the optimal flowering season, it is noted that the EA that was previously granted for the RBIDZ Phase 1F (reference no.: 14/12/16/3/3/2/665) includes the listed activity related to the clearance of indigenous vegetation*.

- Faunal Assessment (STS, 2026c) –
  - An EA was granted by the former DEA, now the DFFE, for the RBIDZ Phase 1F development in September 2016 (Reference No.: 14/12/16/3/3/2/665). The authorised development included the following infrastructure components: water infrastructure, sewer infrastructure, stormwater infrastructure, roads, electrical services, and the infilling of wetlands to facilitate industrial development. The access roads and associated services required for the proposed project are therefore already covered under the existing EA and do not form part of the current application. Importantly, the infilling of wetlands within the site has also been authorised under the existing EA and is excluded from the present assessment. All wetlands within the study area, will be infilled to allow for development as per the EA granted in 2016 (Ref 14/12/16/3/3/2/665). As such, impacts to freshwater ecosystems and their associated faunal assemblage are not assessed as part of this report. However, for completeness and to inform the broader ecological context of the site, baseline information relating to the freshwater habitats present within the study area has been included.
  - The faunal assessment is confined to the proposed study area but the immediate surroundings were however taken into consideration in terms of faunal habitat utilisation and movement patterns. The entire study area and immediate surroundings were included in the desktop analysis of which the results are presented in Part A of the overall report.
  - With ecology being dynamic and complex and the habits of many faunal species, some aspects (some of which may be important) may have been overlooked. It is, however, expected that most faunal communities have been accurately assessed and considered and the information provided is considered sufficient to allow informed decision making to take place and facilitate integrated environmental management.
  - Due to the nature and habits of many faunal taxa, it is unlikely that all species or classes would have been observed during a field assessment. Therefore, site observations were compared with literature studies where necessary.
  - Due to the locality of the study area, continuous anthropogenic activities, the cyclical nature of the life stages of many species, as well as the season of the assessment, few faunal species were observed during the site visit. As such, background data (desktop) and literature studies pertaining to the surrounding areas of the study area, an assessment conducted in April 2022 were used to further infer faunal species composition and sensitivities in relation to the available habitat, and the findings of this assessment are an accurate reflection of the ecological characteristics of the study area.

  - Sampling by its nature, means that not all individuals are assessed and identified. Some species and taxa within the footprint area may therefore have been missed during the assessment.
  - For the faunal SCC assessment, the most recent Regional Red Data Book of Birds of South Africa, Lesotho, and Eswatini (Lee *et al*., 2025 as cited in STS, 2026c) was consulted. However, as this publication is not yet reflected in the South Africa National Biodiversity Institute (SANBI) database, the precautionary principle was applied, and the highest conservation status from either source was used in this report.
  - One site assessment was undertaken on 13 June 2024 (winter season). Further investigation within a more suitable season (summer or spring) is recommended to confirm the presence or absence of certain SCC, to determine the suitability of the study area, and to support and/or guide the authorisation process required in terms of NEMA. For the purpose of this report, a precautionary principle was applied to species Probability of Occurrence (POC) to account for this seasonality. *Note: Although the faunal survey was not conducted during the optimal season, it is noted that the EA that was previously granted for the RBIDZ Phase 1F (reference no.: 14/12/16/3/3/2/665) includes the listed activity related to the clearance of indigenous vegetation (including associated habitat)*.
- Climate Change Impact Assessment (Promethium Carbon, 2026) –
  - The Project's vulnerability to climate change was assessed using available datasets. Climate data was extracted and anyalysed at the finest scale possible, however, it is important to acknowledge that modelling climate variables remains complex, particularly at localised scales. Future climate projections typically have a coarser resolution than observed or reanalysed historical climate data, which may introduce a level of uncertainty. While every effort was made to utilise data specific to the proposed 750MW Combined Cycle Power Plant (CCPP) in Richards Bay some datasets represent aggregated trends over a larger area rather than precise site-level conditions.
  - Uncertainties in climate projections should be carefully considered by the project developer, as increasing climate variability may affect the long-term operational performance and asset durability of the Project. For example, changes in rainfall intensity, ambient temperatures, or wind exposure may influence maintenance requirements, equipment performance, or logistics planning. Despite these limitations, the overall climate risk trends remain valid, and the findings provide a basis for adaptation planning for the Project.
- Air Quality Impact Assessment (uMoya-NILU, 2026) –
  - No ambient monitoring was done in this assessment, rather available ambient air quality data is used.
  - The assessment of potential human health impacts is based on model predicted ambient concentrations of SO_2, NO_2, PM_{10} and CO and the health-based NAAQS.
- Visual Resource Compliance Statement (SAS, 2025) –

  - No specific national legal requirements for Visual Impact Assessments currently exist in South Africa. However, the assessment of visual impacts is required by implication when the provisions of relevant acts governing environmental management are considered and when certain characteristics of either the receiving environment or the proposed project indicate that visibility and aesthetics are likely to be significant issues and that visual input is required (Oberholzer, 2005 as cited in SAS, 2025).
  - Distance and terrain play a critical role when assessing the visual impacts of an area. Due to the undulating terrain and dense vegetation of the area, it was deemed necessary to identify all potential sensitive receptors within a 3 km radius, on a desktop-level, which would then be verified during the field assessment. The 3 km radius can be considered the “visual assessment zone”. It should be noted that the visibility of an object decreases exponentially the further away the observer is from the source of impact.
- Noise Impact Assessment (Enviro-Acoustic Research, 2026) –
  - Ambient noise measurements represent conditions during the survey periods and may vary due to changing weather conditions, seasonal influences, traffic volumes and other temporary noise sources.
  - Predicted noise levels are based on established acoustic propagation models and accepted engineering assumptions. Actual noise levels may differ slightly due to variations in equipment specifications, operating conditions, meteorological conditions, and site-specific factors.
  - The assessment relies on information provided by the project team, published noise emission data, conceptual equipment layouts and standard operating scenarios. Where detailed design information was unavailable, reasonable assumptions were applied.
  - The effectiveness of mitigation measures depends on their proper design, installation, operation and maintenance. The actual noise reduction achieved may vary from predicted values.
  - Any inaccuracies, omissions or future changes to the project design, equipment selection or operational parameters could influence the assessment findings and predicted impacts.
  - The report is subject to specific conditions and should be interpreted in conjunction with the assumptions, limitations and available information at the time of the assessment.
- Community Health Impact Assessment (Niara Environmental Consultants, 2026) –
  - This report and assessment are dependent on the accuracy of the publicly-available secondary information; from sources such as Statistics South Africa (Census, 2011 and Community Survey, 2016) and the Health Systems Trust (District Health Barometer, 2022/23). Where possible, the information was verified during a site visit. The data was considered sufficient for the purpose of this study.
  - It should be noted that the social environment is a dynamic, constantly changing entity. It is therefore not always possible to predict all social impacts at a very high level of

accuracy. Care has been taken to identify the most likely and significant impacts that are the most relevant to the current local context.

- Individuals view possible impacts differently due to their association with the anticipated impact. Impacts could therefore be perceived and rated differently from those contained in the Biophysical Studies. Further public participation can be used to inform and update findings.
- Limitations encountered on site include (but are not limited to);
- A limitation encountered was the public clinics declining to participate in the interviews for health care personnel / key informants. This was due to protocols that require a consultant to get permission from the district. Although the procedure was too lengthy for this study, it will be taken into consideration for upcoming similar studies. In order to get around this obstacle, the field consultants interviewed general practitioners.
- Sampling bias: results may not be 100% accurate as the survey sample is not representative of the entire community and may not accurately reflect the views or conditions of the broader population. This was overcome by ensuring an adequate number of community members were interviewed in each Potentially Affected Community which would thus serve as a baseline for that particular community.
- Community trust and privacy concerns: there was indication of lack of trust between community members and surveyors and so some respondents were less willing to answer more sensitive questions. Ensuring the privacy and confidentiality of respondents was challenging, especially in small communities where anonymity is harder to maintain. This was overcome by providing interviewees the option of answering the questionnaire anonymously and emphasising that their responses would solely be used for this particular study.

- Socio-Economic Impact Assessment (Urban-Econ, 2026) –
  - All information provided to the specialist by the EAP and the project proponent is presumed to be accurate and reliable.
  - While the secondary data sources used to develop socio-economic baseline (including demographic information and economic dynamics) are not exhaustive, they are considered indicative of the broader trends within the study area.
  - The study was conducted with the information available to the specialist within the time frame specified.
  - Predicting potential impacts and stakeholder responses to these impacts with complete accuracy is inherently challenging even under similar conditions. These forecasts are derived from extensive research and professional experience considering the unique circumstances of the study.
  - The latest available stats at local municipal level and sub place were used as the primary source of data. Where possible, this has been augmented with data obtained from the Quantec Standardised Regional Dataset which contains some of the most widely accepted projections of StatsSA data up to 2024. It must be noted that at the time of developing this report the Census 2022 data was not yet available at local area/ subplace level.

  - This report is mainly based on the use of secondary data sources and limited primary research. As such, the findings and conclusions presented are limited by the availability, accuracy and timeliness of publicly accessible and published information.
- Desktop Palaeontology Impact Assessment (Banzai Environmental, 2026) –
  - The geology of the area is the focal point of geological maps, and the sheet explanations of the Geological Maps were not intended to focus on palaeontological heritage. Many inaccessible areas of South Africa have never been examined by palaeontologists, and data are typically dependent solely on aerial pictures. Locality and geological information in museums and university databases is out of date, and data acquired in the past is not always adequately documented. To address these gaps, comparable Assemblage Zones and geological formations from better-studied regions are often referenced to infer the potential for fossil presence in previously undocumented areas. In desktop studies, it is typically assumed that fossil heritage may be present where similar stratigraphy is exposed. However, a field-based assessment is essential to validate and refine these assumptions, thereby enhancing the accuracy of the palaeontological sensitivity rating.
- Quantitative Risk Assessment (RISCOM, 2026) –
  - The risk assessment was developed based on the information provided by the client, and its engineering suppliers. These designs are conceptual and does not include detailed designs or in some cases, insufficient information to conduct a thorough risk assessment. To this end, the results obtained in this report may lack the accuracy of a detailed engineered plant. However, the risks generated are expected to represent the facility, provided that the vessel size and inventory are not increased.
  - These assumptions ensure that the assessment remains precautionary and aligned with the NEMA principles of risk avoidance and minimisation.
- Hydrology Assessment (GCS, 2026) –
  - In line with the development of the flood lines, the following assumptions were made:
    - The topographic data available for the study area is of sufficient accuracy and coverage to enable conceptual hydraulic modelling at a suitable level of detail;
    - Steady-state hydraulic modelling was undertaken, which assumes the flow is continuous at the maximum peak rate; and
    - A mixed flow regime that is tailored to both subcritical and supercritical flows was selected for running the steady-state model.
  - Steady-state flood modelling was undertaken, which is a conservative approach as it ignores the effect of storage within the system and therefore produces higher flood levels than would be expected to occur. A steady-state model will result in worst-case (conservative) estimates of flooding, and resultant flood levels and floodplain extents would decrease if unsteady state modelling were undertaken using an inflow hydrograph as opposed to continuous peak flow. It is noted that some of the flooding zones make flooding “bubbles” or islands. This is due to the moderate-low-resolution Digital Terrain Model (DTM), which causes irregular flooding paths. The flood lines produced are based on available data. Due to the flood risk posed to the project

infrastructure, further flood modelling work is considered necessary and would require more detailed topographical data.

- The following assumptions and limitations pertain to the Stormwater Management Plan:
  - The proposed layout was used to assume stormwater movement at the site once the site is developed.
  - The inputs into the model were based on expected future land use and rainfall data, and the sources were deemed sufficient to represent runoff on the sites.
  - No significant changes in upstream or downstream conditions are expected.
  - The design storm duration used to model the rainfall-runoff volumes will be fixed at 24 hours. However, the final stormwater design should be determined by a civil engineering team, who may exercise their professional judgment in selecting the most suitable design storm duration.
  - The stormwater management plan is considered conceptual, and detailed civil engineering designs should be conducted before any construction activities of the proposed measures are commenced.
  - This hydrological assessment and conceptual stormwater management plan are intended solely to inform and support civil engineering aspects and subsequent designs.

- Social Impact Assessment (Nemai Consulting, 2025) –
  - The assessment was conducted under the assumption that the Project will proceed according to the proposed “two-phase” development plan. Any delays or changes to this schedule could affect the social impacts, especially in terms of employment opportunities and economic stimulation.
  - Employment opportunities during the construction phase might help boost the local economy, but how much of an impact this has will rely on the region's capacity for contractors and the availability of skilled workers.
  - There will be no major shifts in policies, regulations, or governance structures that will affect the Project's progress, timeline, or social outcomes.

8 NEED AND DESIRABILITY

This section serves to expand on the motivation for the proposed Project that is provided in Section 3 above. The format contained in the Guideline on Need and Desirability (DEA, 2017) was used in Table 9 below.

Table 9: Need for and desirability of the proposed Project

Question No.	Response
1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area? *1.1. How were the following ecological integrity considerations taken into account?:* *1.1.1. Threatened Ecosystems.* *1.1.2. Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.* *1.1.3. Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs").* *1.1.4. Conservation targets.* *1.1.5. Ecological drivers of the ecosystem.* *1.1.6. Environmental Management Framework.* *1.1.7. Spatial Development Framework.* *1.1.8. Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.).*	It is noted that the EA for the RBIDZ Phase 1F, which was granted in Sept 2016 (reference no.: 14/12/16/3/3/2/665), allowed for the clearance of the site and for the infilling of wetlands on the site. The site is currently undeveloped/vacant and is mowed and maintained by the RBIDZ. The following specialist studies were undertaken to assess the impacts of the Project on the ecological integrity of the area: ▪ Terrestrial Biodiversity Assessment; and ▪ Freshwater Ecosystem Assessment. The findings of the above studies are presented in the EIA Report. Management objectives are included in the EIA Report and EMPr to safeguard the sensitive ecological features that were identified.
1.2. How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Potential direct disturbances to ecosystems may include the following (amongst others): ▪ Poor practices during the construction and operational phases may pollute the biophysical environment and may reduce the resource quality of the wetland to the south-west of the site; and ▪ The grass on the site will be replaced with hard surfaces, as part of the development. Refer to response to question no. 1.1 above.
1.3. How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	The Project may cause surface water, groundwater, soil, air, noise and light pollution during the construction and operational phases. The above impacts were assessed during the Environmental Impact Reporting phase and mitigation measures are included in the EIA Report and EMPr to manage these impacts.
1.4. What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?	The waste to be generated by the Project includes the following (amongst others): ▪ Construction – o Waste generated from site preparations (e.g. plant material), domestic waste, surplus and used building material, and hazardous waste (e.g. chemicals, oils, soil contaminated by spillages, diesel rags). Solid waste generated during the construction phase will be temporarily stored at suitable locations (e.g. at

Question No.	Response
	the construction camp) and will be removed at regular intervals and disposed of at approved waste disposal sites. All the waste disposed of will be recorded. o Wastewater will include domestic sewage, water used for washing purposes and drainage over contaminated areas. ▪ Operation – o Minimum solid waste will be generated during the operational phase of the proposed Plant. Domestic waste from operational staff and waste generated during maintenance works will be disposed of at a licensed waste disposal site. o Liquid wastes produced during the operational phase will include wastewater (including water used in cooling processes and domestic sewage), condensate water as well as lubricants, oils and spent chemicals from operation and maintenance activities. Mitigation measures to manage all waste and wastewater generated during the construction and operational phases are included in the EMPr.
1.5. How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	The site is located within the RBIDZ. The site is currently undeveloped/vacant and is mowed and maintained by the RBIDZ. Disturbances to cultural heritage are not anticipated. No heritage features were identified on the project site as part of the EIA that was done for Phase 1F of the RBIDZ. The KZN Amafa and Research Institute issued a No Objection Letter, which states that the Project is exempted from a further Full Phase 1 Heritage Impact Assessment, and that only a chance find protocols will apply.
1.6. How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	The proposed Plant will be powered by natural gas, which is a non-renewable natural resource. The gas will be secured through the TNPA's natural gas terminal (in accordance with the GASIPPPP). By utilising a CCGT configuration, efficiencies greater than 50% can be achieved. On a CCGT, this waste heat energy is captured by a heat recovery steam generator (HRSG). The HRSG uses this energy to generate steam, which is delivered to a steam turbine for additional electricity generation.
1.7. How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts? *1.7.1. Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)? (note: sustainability requires that settlements reduce their ecological footprint by using*	The proposed Plant will be powered by natural gas, which is a non-renewable natural resource. The gas will be secured through the TNPA's natural gas terminal (in accordance with the GASIPPPP). Impacts to the receiving environment were assessed during the Environmental Impact Reporting phase and are presented in the EIA Report. Opportunity costs are associated with the net benefits forgone for the development alternative. The site is located within Phase 1F of the RBIDZ, which is a purpose-built and secured industrial estate linked to the PoRB that aims to attract local and foreign direct investment, such as the proposed Project. The location of the project site in the industrial estate (Erf 16673) was identified by the RBIDZ, in consultation with the Applicant.

Question No.	Response
less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life). *1.7.2. Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources this the proposed development alternative?)* *1.7.3. Do the proposed location, type and scale of development promote a reduced dependency on resources?*	
1.8. How were a risk-averse and cautious approach applied in terms of ecological impacts? *1.8.1. What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?* *1.8.2. What is the level of risk associated with the limits of current knowledge?* *1.8.3. Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?*	Refer to response to question no. 1.1 above.
1.9. How will the ecological impacts resulting from this development impact on people's environmental right in terms following: *1.9.1. Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?* *1.9.2. Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?*	Refer to response to question no. 1.1 above regarding the ecological integrity of the area. Potential impacts of the Project to the people's environmental right may include the following (amongst others): ▪ Air quality deterioration and contributions to climate change from emissions from the Plant; ▪ Visual impacts caused by the components of the Plant; ▪ Noise from the operation of the Plant (noise sources include turbines, compressors, and other equipment); ▪ Impacts on traffic during the construction phase; and ▪ Risks posed by hazardous components of the Plant (e.g., rupturing of vessels under pressure and dispersion of toxic vapours). The following related specialist studies were undertaken during the EIA phase: ▪ Noise Impact Assessment; ▪ Visual Resource Compliance Statement; ▪ Climate Change Impact Assessment; ▪ Air Quality Impact Assessment; ▪ Health Impact Assessment; ▪ Quantitative Risk Assessment; ▪ Socio-Economic Impact Assessment; and ▪ Social Impact Assessment. A Traffic Impact Assessment was also done for the broader Phase 1F development of the RBIDZ. The findings of the above studies are presented in the EIA Report. Related management objectives are included in the EIA Report and EMPr.
1.10. Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in	Refer to responses to questions no. 1.1 and 1.9 above. The proposed site is located within the industrial estate of the RBIDZ.

Question No.	Response
socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?	
1.11. Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?	Refer to response to question no. 1.1 above regarding the ecological integrity of the area.
1.12. Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?	Refer to the options considered in Section 10 below.
1.13. Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?	Potential cumulative impacts are discussed in Section 13.27 below.
2.1. What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?: *2.1.1. The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks of policies applicable to the area,* *2.1.2. Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),* *2.1.3. Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and* *2.1.4. Municipal Economic Development Strategy ("LED Strategy").*	The socio-economic environment is discussed in Section 11.11 and Section 12.12 below. The following is noted from a strategic planning perspective: ▪ The site is located within Phase 1F of the RBIDZ, which is a purpose-built and secured industrial estate linked to the PoRB that aims to attract local and foreign direct investment, such as the proposed Project. From this perspective, the Project is not in conflict with the spatial priorities, characteristic and spatial patterns of the CoU. ▪ The CoU IDP for 2022/2027 (CoU, 2022a) and the SDF (CoU, 2022b) acknowledge the importance of the RBIDZ a prime industrial business and trade hub with prime rail and road access, and the strategic linkage of the SEZ with the PoRB. The CoU SDF aims to seek alignment with long term future Port Development Framework and RBIDZ Plans. It is also noted in the IDP that the CoU together with RBIDZ and TNPA have established a tripartite committee focusing on strategic investments and job creation within the municipality. ▪ Some of the key challenges mentioned in the IDP (CoU, 2022a) in the municipality, which need to be taken into consideration for the Project, include (amongst others) – o Low skills levels and limited skills development; o High rate of unemployment and sluggish economic growth; o Lack of water security of supply; and o Negative impact of climate change.
2.2. Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area? *2.2.1. Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?*	Refer to the responses to questions no. 1.9 and no. 2.1 above, as well as question no. 2.5 below.
2.3. How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	
2.4. Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?	

Question No.	Response
2.5. In terms of location, describe how the placement of the proposed development will: *2.5.1. result in the creation of residential and employment opportunities in close proximity to or integrated with each other,* *2.5.2. reduce the need for transport of people and goods,* *2.5.3. result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport),* *2.5.4. compliment other uses in the area,* *2.5.5. be in line with the planning for the area,* *2.5.6. for urban related development, make use of underutilised land available with the urban edge,* *2.5.7. optimise the use of existing resources and infrastructure,* *2.5.8. opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),* *2.5.9. discourage "urban sprawl" and contribute to compaction/densification,* *2.5.10. contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,* *2.5.11. encourage environmentally sustainable land development practices and processes,* *2.5.12. take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),* *2.5.13. the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential),* *2.5.14. impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and* *2.5.15. in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?*	2.5.1. The Project will result in increased economic activity, as well as increased opportunities for employment and for SMMEs. 2.5.2. The Applicant will source the supply and delivery of natural gas from the planned terminal development at the PoRB, which is a Transnet-led initiative. The natural gas is expected to be supplied through a pipeline from the Transnet natural gas terminal to the Plant. 2.5.3. Not deemed to be relevant, due to the nature of the development. 2.5.4. The site is located within Phase 1F of the RBIDZ, which is a purpose-built and secured industrial estate linked to the PoRB. 2.5.5. Refer to the response to question no. 2.1 above regarding planning. 2.5.6. The site is located within Phase 1F of the RBIDZ, which is a purpose-built and secured industrial estate linked to the PoRB. 2.5.7. Not deemed to be relevant, due to the nature of the development. 2.5.8. Not deemed to be relevant, due to the nature of the development. 2.5.9. Not deemed to be relevant, due to the nature of the development. 2.5.10. Not deemed to be relevant, due to the nature of the development. 2.5.11. To be assessed during the EIA phase. 2.5.12. The site is located within Phase 1F of the RBIDZ, which is a purpose-built and secured industrial estate linked to the PoRB. 2.5.13. The site is located within Phase 1F of the RBIDZ, which is a purpose-built and secured industrial estate linked to the PoRB. The findings of the Socio-Economic Impact Assessment are presented in Section 12.12 below. 2.5.14. Refer to the response to question no. 1.5 above. 2.5.15. Refer to the response to question no. 2.1 above regarding planning.
2.6. How were a risk-averse and cautious approach applied in terms of socio-economic impacts? *2.6.1. What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?* *2.6.2. What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?* *2.6.3. Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?*	The findings of the Socio-Economic Impact Assessment are presented in Section 12.12 below.
2.7. How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following: *2.7.1. Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not*	Refer to the responses to questions no. 1.9 and 2.1 above. The findings of the Socio-Economic Impact Assessment are presented in Section 12.12 below.

Question No.	Response
possible, to minimise, manage and remedy negative impacts? *2.7.2. Positive impacts. What measures were taken to enhance positive impacts?*	
2.8. Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	Refer to responses to questions no. 1.1 and 1.9 above. The proposed site is located within the industrial estate of the RBIDZ.
2.9. What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	Project options are discussed in Section 10 below.
2.10. What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? *Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?*	
2.11. What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	Refer to the responses to questions no. 1.7, 1.9, and 2.1 above.
2.12. What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	Mitigation measures to manage these impacts are included in the EMPr. Also refer to the response to question no. 1.9 above.
2.13. What measures were taken to: *2.13.1. ensure the participation of all interested and affected parties,* *2.13.2. provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,* *2.13.3. ensure participation by vulnerable and disadvantaged persons,* *2.13.4. promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means,* *2.13.5. ensure openness and transparency, and access to information in terms of the process,* *2.13.6. ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge, and* *2.13.7. ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein were be promoted?*	Section 14 below provides an overview of the public participation process, which includes the following: ▪ Public Participation during the Scoping Phase; ▪ Maintenance of the database of I&APs; ▪ Period to review the Draft EIA Report; ▪ Notification of review of the Draft EIA Report; ▪ Means of accessing the Draft EIA Report; and ▪ Addressing comments on the Draft EIA Report. Comments received from authorities and I&APs during the process are included in the CRR and will be submitted with the final EIA Report.
2.14. Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g.. a mixture of low-,	The findings of the Socio-Economic Impact Assessment are presented in Section 12.12 below.

Question No.	Response
middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	Also refer to the responses to questions no. 1.9 and 2.5 above.
2.15. What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	Health and safety related risks associated with the Project during the construction and operational phases are assessed in the EIA Report. These risks are addressed through mitigation measures that are included in the EMPr. Additional management requirements will be included in the Project's OHS system.
2.16. Describe how the development will impact on job creation in terms of, amongst other aspects: *2.16.1. the number of temporary versus permanent jobs that will be created,* *2.16.2. whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area),* *2.16.3. the distance from where labourers will have to travel,* *2.16.4. the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits), and* *2.16.5. the opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).*	The Project will have a beneficial impact on local employment during the construction and operational phases. During these phases, the Project will provide employment opportunities to many local skilled, semi-skilled and non-skilled workers in addition to professionals with higher academic qualifications. The Project will be executed in two phases, namely the construction of the Open Cycle Plant followed by the construction of Combined Cycle Plant. More than 500 employees are estimated as total workforce for construction of the Plant, which may change based on actual requirements. The total workforce required during the operational phase will be around 50 people.
2.17. What measures were taken to ensure: *2.17.1. that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment, and* *2.17.2. that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?*	According to the IRP 2023, published in GN 4238 GG 49974 of 4 January 2024, GTP technologies in the form of CCGT, Closed Cycle Gas Engine (CCGE) or Internal Combustion Engine (ICE) provide the flexibility required to complement renewable energy. In the short term, the goal is to pursue gas import options, as local and regional gas resources will allow for scaling up within manageable risk levels. The National Development Plan (NDP) identifies natural gas as a viable alternative to coal. The NDP further provides as one of the infrastructure priorities the construction of infrastructure to import LNG and increasing exploration to find domestic gas feedstock. The Applicant intends to bid for the GASIPPPP (and/or other suitable energy markets), which was identified by the DMRE as the appropriate programme to procure the new generation capacity determined in terms of the IRP to ensure energy security. The Project is designated as a SIP, and it is thus to be managed within the requirements of the Infrastructure Development Act (Act No. 23 of 2014). The EIA process and the associated specialist studies strive to consider the various policies, strategies, plans and programmes that have a bearing on the Project. Various organs of state, as listed in the database contained in **Appendix H**, were notified of the Project. These organs of state have been kept informed during the course of the EIA process.
2.18. What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	Impacts to the receiving environment were assessed through various specialist studies during the Environmental Impact Reporting phase. The findings from these studies are included in the EIA Report (see Section 11.21.3 below).

Question No.	Response
2.19. Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	The intention is for the mitigation measures that are included in the EIA Report and EMPr to be realistic and for the residual risks to be managed to an acceptable level. The conditions of the EA, if granted by DFFE, will be imposed on the Applicant and will be legally enforceable. The EMPr's management requirements will also need to be adhered to by the Applicant, contractor(s) and project team, as relevant.
2.20. What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	
2.21. Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	The options are discussed in Section 10 below.
2.22. Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?	Potential cumulative impacts are discussed in Section 13.27 below, which took into consideration the findings contained in the specialists' reports.

9 PROJECT DESCRIPTION

The project description provided in the sub-sections to follow is based on the latest information provided by the Project's Technical Team.

9.1 Natural Gas

According to the DMRE (2021), natural gas is a fossil fuel naturally occurring as a gaseous mixture of light hydrocarbons in sedimentary rocks. Though it primarily consists of methane, there are other hydrocarbons that contribute to the makeup of natural gas and after natural gas is refined, those individual hydrocarbons can be used as various sources of energy. Natural gas is often a byproduct of crude oil extraction and either needs to be used or flared.

Natural gas can be contained in a variety of different types of deposits. Natural gas has been extracted from conventional natural gas deposits (i.e., "pockets" of gas contained within relatively porous rock) for a long time, while the unconventional resources are resources that are being extracted using newly developed techniques (DMRE, 2021).

Natural gas is either transported via high pressure gas transmission pipelines, or it can be liquefied under cryogenic temperatures and transported by ship as liquefied natural gas (LNG). Alternatively smaller volumes can be pressurised in containers and transported as compressed natural gas (CNG).

Unlike crude oil and coal deposits, natural gas is low in sulphur, with any sulphur being easily removed prior to use, down to insignificant levels.

A typical lower heating value (LHV) for natural gas is 36.5 MJ/Nm^3 or 45.6 MJ/kg. The density of natural gas is around 0.8 kg/Nm^3.

9.2 Gas-to-Power

Gas-to-Power (GTP) describes the process of converting natural gas into power. This process is made possible through the thermodynamic process of converting the chemical energy stored in the natural gas to thermal energy, via mechanical energy to electrical energy.

A common GTP method utilises gas turbine generators, either in simple cycle or combined cycle configurations. In a simple cycle gas plant, natural gas is fed into a combustion chamber where it is mixed with pressurised air from a compressor and ignited. Further, the hot air-fuel mixture from the combustion chamber is fed into a turbine which is connected to a crankshaft. The crankshaft connects to the compressor and a generator, which generates and then delivers electricity to a grid system (https://www.econnectenergy.com/articles/the-benefits-of-gas-to-power). The combined

cycle consists of a simple cycle with an attached steam bottoming cycle with a heat recovery steam generator (HRSG). The bottoming cycle utilises excess heat from the single cycle gas turbine to generate steam which is used to generate electrical power through a second generator. In this way, the amount of waste heat and gas consumption is lowered, CO_2 emissions per unit of power are reduced, and the plant's overall efficiency can increase. A typical combined cycle generation process is shown in Figure 8 below.

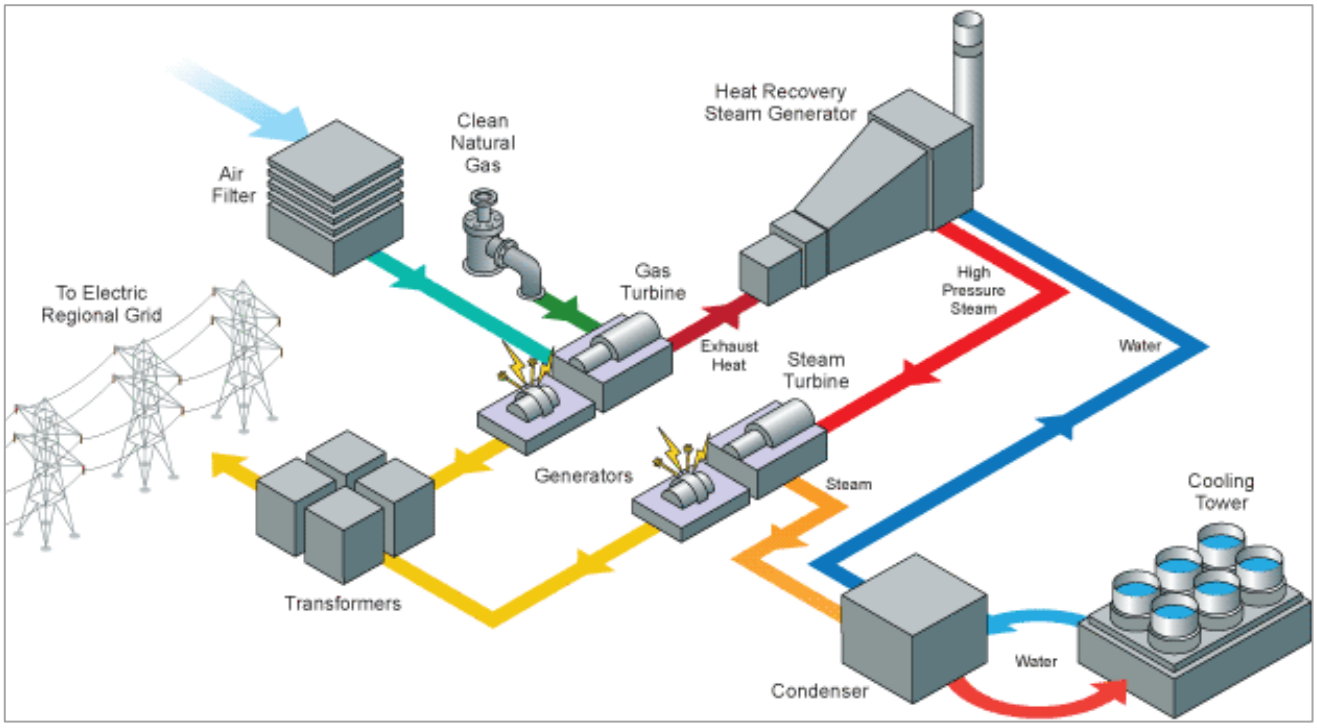


Figure 8: Combined cycle generation process

A photograph of an example of a CCGT Power Plant is shown in Figure 9 below.



Figure 9: Photograph of an example of a CCGT Power Plant

The Combined Cycle Power Plant (CCPP) Module will consist of a circa 750 MW Power Block. It will consist of two (2) Gas Turbines each having capacity of 250 to 300 MW along with Electrical Generators, two (2) Heat Recovery Steam Generators (HRSGs) and one (1) Steam Turbine

Generator (STG) having capacity of 250 to 300 MW. The CCPP is based on the latest state of the art heavy duty industrial type Class F Gas Turbines, which are suitable for base load and mid merit operation in both simple (open) cycle and combined cycle mode. The main advantages of the above selected configuration include:

- High part load efficiency;
- Higher reliability;
- More operational flexibility;
- Less time for installation;
- Can be used for peaking duty; and
- It is proven equipment globally with references.

A Gas Turbine delivers a reliable, highly efficient, power output, while maintaining best-in-class NO_x and CO emission levels. It has a dry low emissions system that ensures a low NO_x level by premixing the fuel and air prior to combustion.

The HRSG will be a triple pressure, reheat, natural circulation type, unfired, outdoor type located adjacent to the gas turbines. The steam conditions will be suitable for the desired net output of combined cycle plant.

9.3 Fuel Supply

9.3.1 Natural Gas

In order to provide natural gas importation infrastructure, TNPA is proposing to build an LNG Terminal in the PoRB, namely the Zululand Energy Terminal (ZET). This terminal will include either a Floating Storage and Regasification Unit (FSRU) or Floating Storage Unit (FSU), which will be connected to the land-based regasification facility. This development will include the requisite bulk services, associated gas distribution pipes, and marine infrastructure (berth).

The Applicant will source the supply and delivery of natural gas from the planned terminal development at the PoRB. The natural gas is expected to be supplied through a pipeline from the Transnet natural gas terminal to the Plant (see map contained in Figure 10 below).

There are no plans at this time for on-site natural gas storage at the Plant for reserve supply due to the proximity of the planned Transnet natural gas terminal and the expected reliability of supply.

This S&EIR Process excludes the development and operation of the gas supply infrastructure.



Figure 10: RBIDZ / ZET pipeline routing
(Source: RBIDZ Presentation – Mabasa Meeting, February 2026)

9.3.2 Possible Backup Operation on Distillate Fuel

The gas turbines are capable of operating on a liquid fuel in the event of the loss of Natural Gas supply. Typically, the alternative fuel would be a middle distillate oil such as diesel. For the purposes of this document, ULSD diesel is assumed, and there would be no material changes if this fuel was a more generic middle distillate.

Given the nature of the operations of LNG Regasification and Storage Terminals and the buffering capacity in the Natural Gas Pipeline, a loss of gas supply to the Power Station would be unlikely, however the commercial arrangements, such as the PPA or Lenders Agreements might require the capability to operate at full load for a specified period of time on the backup fuel.

Equipment needed for operation on diesel fuel would include road-tanker offloading stations, diesel tanks, pumps, filters and a fuel circulation loop. For the purposes of the EIA, 3 days of backup fuel storage are included although it is unlikely that this option would be implemented.

9.4 Project Summary

A summary of the Project is provided in Table 10 below.

Table 10: Project summary

Component	Description / Dimensions
Location of the Site	Erf 16673 in Phase 1F of the RBIDZ.
Landowner	The land is owned by RBIDZ. The premises is leased under a long-term agreement.
Municipal Jurisdiction	KCDM (district) and CoU (local)
Electricity Generating Capacity	The Plant will be designed for base load operations at 500MW in Simple Cycle and 750MW in Combined Cycle.
Proposed Technology	The CCGT power plant will utilise a gas turbine generator to generate electricity using natural gas as fuel. The waste heat is used to generate steam to produce additional electricity via a steam turbine. The gas turbine operates on the Brayton Cycle, wherein the ambient air is first filtered, then compressed. In the combustor, the compressed air is heated by combustion of natural gas fuel. The high pressure-high temperature gas from the combustor is expanded in the turbine section and the remaining pressure drives the gas through the HRSG and stack. The heat from the exhaust gas is recovered in the HRSG to generate high pressure-high temperature steam, which in turn is expanded in the steam turbine and condensed to water in the condenser. The condensate from the condenser is pumped back to the HRSG. This steam-water cycle connected to the HRSG operates on the Rankine Cycle. After passing through the HRSG, the flue gas will be exhausted to the atmosphere through the main stack. The proposed Plant will employ the most recently developed CCGT technology.
Extent of the Property	Approximately 12.7 Ha.
Extent of the Proposed Plant	Approximately 12.2 Ha.

Component	Description / Dimensions
Stack Dimensions	The Plant needs to maintain a minimum 30 m of stack height with a diameter of approximately 6.9 m for the bypass stack and 60 m with a diameter of approximately 6.3m for the HRSG stack.
Elevation of Site	Elevations for the site area range from 40 to 43 m above mean sea level
Fuel Type for Plant	Liquefied Natural Gas (LNG), potentially backed up by diesel for short periods of gas interruption.
Site Access	The access point to RBIDZ Phase 1F is via Alumina Allee Road. The site within the industrial estate is accessed via an existing tarred road (external to the leased premises).
Water Requirements	**Construction phase**: Water for construction purposes will be directly sourced from the water available at the boundary of the site within the RBIDZ Phase 1F.
	Operational phase: The Plant's water requirements are (water-cooled case): • Potable water for domestic use: 6,000 ℓ/d • Demineralised water for HRSG and other: 256,000 ℓ/d • Service water requirement: 48,000 ℓ/d • Possible cooling water makeup: 21,000,000 ℓ/d Allowing for water treatment losses, this water requirement can be met by: • Potable water: 415,000 ℓ/d • Bulk clarified water: 21,000,000 ℓ/d if the water-cooled option is selected Water for operational purposes will be sourced from uMngeni-uThukela Water (UUW).
Associated Infrastructure	▪ Construction camp and laydown area ▪ Workshop ▪ Main Office ▪ Control Building ▪ Warehouse ▪ Fire water pump house ▪ Maintenance facilities ▪ Storage facilities ▪ Ablution facilities ▪ Guard house ▪ Fencing and gates ▪ Waste management facilities
Bulk Services Required	The following bulk services will be supplied by RBIDZ Phase 1F: ▪ Potable water ▪ Bulk clarified water ▪ Sewage ▪ Stormwater ▪ Roads ▪ Electricity External services will be required for: ▪ Waste oil sludge removal; ▪ Water treatment sludge removal General waste during the operational phase will form part of the municipal waste stream.

9.5 Overview of the Proposed Plant

9.5.1 Plant Components

The proposed Plant will comprise of the following key equipment:

- ❑ Two (2) Class F, heavy-duty combustion turbines and generators;
- ❑ Two (2) triple pressure reheat Heat Recovery Steam Generators (HRSGs);
- ❑ One (1) condensing steam turbine and generator;

- One (1) de-aerating surface condenser;
- One (1) induced draft cooling tower, or Air-Cooled Condenser (fin-fan radiators)
- Balance of plant (BOP) equipment consisting of Pumps, Heat Exchangers, Transformers, Power Electrics, Storage etc.;
- One (1) integrated plant distribution control system; and
- 400kV Switchyard comprising of three (3) x 15kV to 400kV step-up transformers and two (2) auxiliary transformers (the rating to be defined during detailed design).

Figure 11 below shows the proposed plant layout. A detailed engineering layout is included in **Appendix A**.

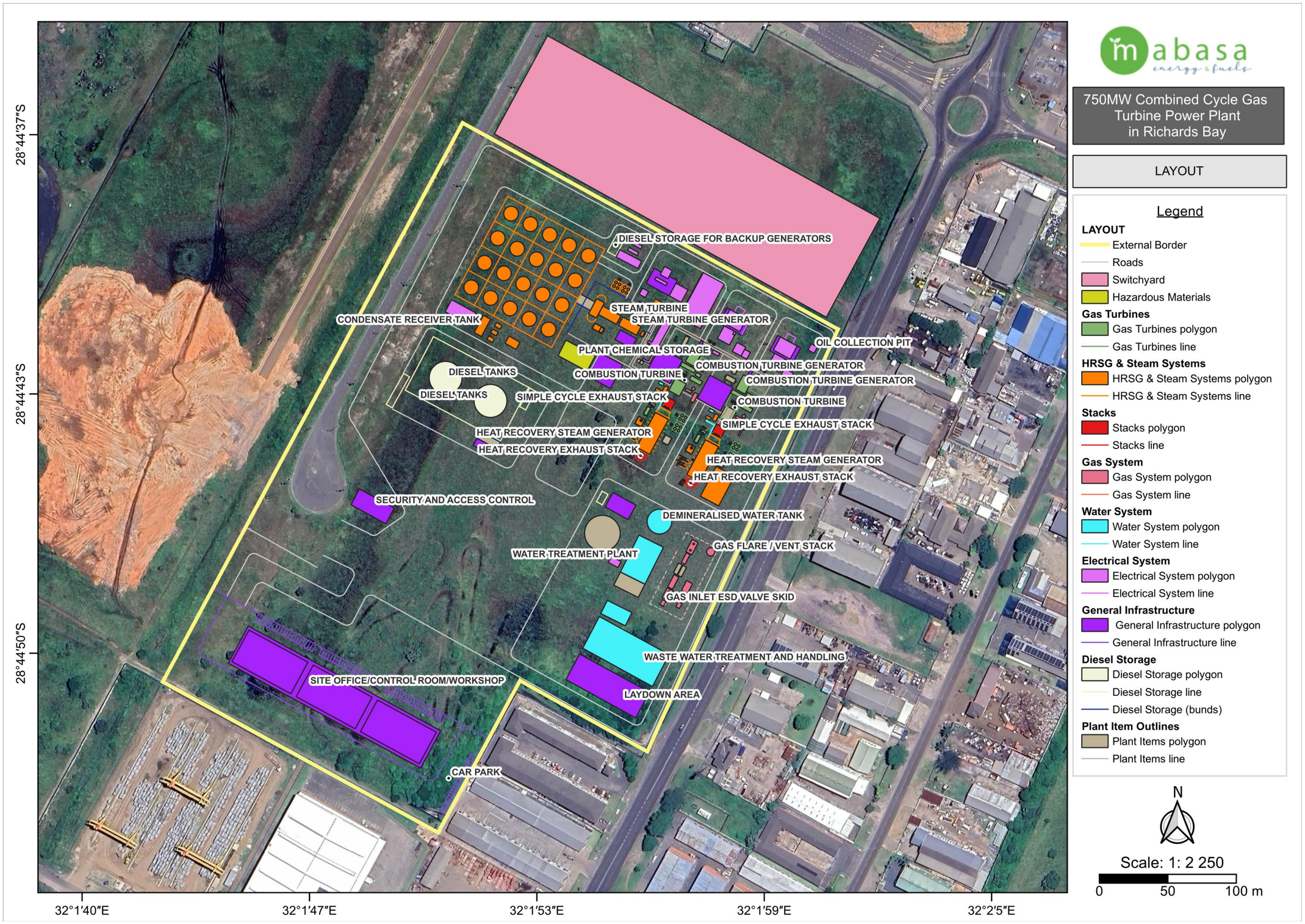


Figure 11: Plant layout (note: not all components labelled due to space constraints – see complete drawing in Appendix A)

9.5.2 *Fuel Supply and Conditioning*

9.5.2.1 *Overview*

The primary fuel for the plant will be natural gas, possibly backed-up by diesel oil, or a similar middle distillate cut, during times of natural gas supply interruptions in the unlikely event this is required by commercial arrangements.

If the dual fuel option is implemented, the transition between fuels will be automated, and design will allow for the changeover from natural gas to diesel oil to be initiated manually by the operator or triggered automatically by a loss of natural gas pressure or flow.

The fuel gas system will be designed complete with all necessary plant, equipment, valves and pipework to safely provide fuel to each gas turbine in sufficient quantities and in accordance with the required gas properties and qualities as specified by the gas engine Original Equipment Manufacturer (OEM). The installation will be designed to ensure safe and satisfactory operation over the range of plant output and expected ambient conditions and to facilitate commissioning, inspection, cleaning, maintenance and repairs.

The terminal point for Natural Gas Supply will be at the facility's battery limit (to be confirmed, but likely the boundary supply flange of the pipeline). The gas from the ZET terminal will connect into the Lilly pipeline which has an operating pressure of around 50 bar. This will necessitate a gas reducing station installed on site to step the gas pressure down to the 30 to 35 bar pressure required by the gas turbines.

At the terminal point, electrical insulation will isolate the plant and its equipment electrically from the upstream pipeline network. Quick acting Emergency Shutdown Valves will be installed close to the battery limit and these will be operated manually, or automatically by the control system in case of emergency.

The gas supply system will be protected against overpressure by the use of relief valves, with the gas routed to a suitable vent.

The highest source of pressure in the gas system is the gas supply line, which is typically 50 bar. This would represent the maximum operating pressure. The temperature in the gas systems, excluding the turbines, will vary between approximately 15°C and 70°C.

The gas pipe routing will be selected with due consideration given to the safety of the installation, ease of maintenance, and obstruction to access etc. The gas piping work will be laid aboveground on pipe sleepers/racks. For areas where access is limited such as road crossing, the pipe shall be installed in a dedicated pipe trench.

All electrical, instrumentation and control equipment for use with the gas fuel system shall generally be certified for the applicable hazardous area classification. Hazardous Area Classification shall be in accordance with IEC 6079-10.

For purging and venting of the gas supply and conditioning system, nitrogen supply points and vents will be provided to allow for purging the entire system, from the battery limit to the gas turbines.

All gas vents and safety valves for the gas supply system and gas turbines will be vented at a safe height above ground level as per all local statutory and environmental regulations in relation to venting gas and maintaining ground level concentrations below the lower explosive limit. The vent stack complete with flame arrestor and silencing equipment will be located in a remote safe area and the area shall be fenced-off with a gate. A hazard warning sign shall be provided at the fence warning of the possibility of gas venting.

9.5.2.2 Gas Metering, Pressure Reduction and Filtering

Before it enters the turbines, the natural gas must be metered and conditioned to suit the OEM specifications.

A coalescing filter will be installed downstream of the emergency shut-off valves and upstream of the metering station to protect the gas flow meters to at least the extent specified by the OEM's, typically 10 – 50 µm. To allow for filter cleaning and maintenance, there will be two filters in parallel, each able to handle 100% of the gas flow.

A gas flow metering and analysis station will be installed to record gas delivered to the plant. To allow for maintenance and periodic calibration and certification, two meters shall be provided, in parallel, each being able to measure 100% of the anticipated maximum natural gas flow.

The gas supply at the plant battery limit will be close to the pressure in the Lilly pipeline, namely about 50 bar. The gas turbines however require a delivery pressure of approximately 30 – 35 bar and so the gas pressure must be reduced.

When the pressure of natural gas is reduced, the gas cools due to the Joule-Thomson effect and this can lead to the formation of methane hydrate or ice. The gas will therefore be heated by around 20°C in a Water-Bath Heater. Again, for maintenance and cleaning purposes, two heaters will be installed in parallel. The Water Bath Heaters will use natural gas to provide the heating, but for cold start purposes, the heaters will be capable of utilising diesel. Diesel for this purpose would be consumed at around 200 L/hr and would be required for about 1 hour before the system is sufficiently warm to switch over to using natural gas for heating. This volume of diesel could be supplied from one of the diesel day tanks.

The water bath heaters will be of the indirect-fired type, with submerged process coil and fire tube. The heaters will be equipped with automatic ignition capability and will have flame detection and fail-safe shutdown systems.

The water supply to the heaters will be service water and will only need occasional topping up. If the service water is not of a suitable quality required by the OEM, then equipment suitable for achieving that quality should be installed. A water-glycol mixture could also be specified for the heaters.

An automatic pressure-reducing station, with two pressure reducing valves in parallel, each capable of handling 100% of the anticipated maximum flow will be installed to reduce the pressure to around 30 – 35 bar.

Downstream of the pressure reducing station a second set of coalescing filters will be installed with a mesh size specified by the gas engine OEM, typically 5 µm.

A block flow diagram of the gas metering and conditioning station is shown in Figure 12 below.

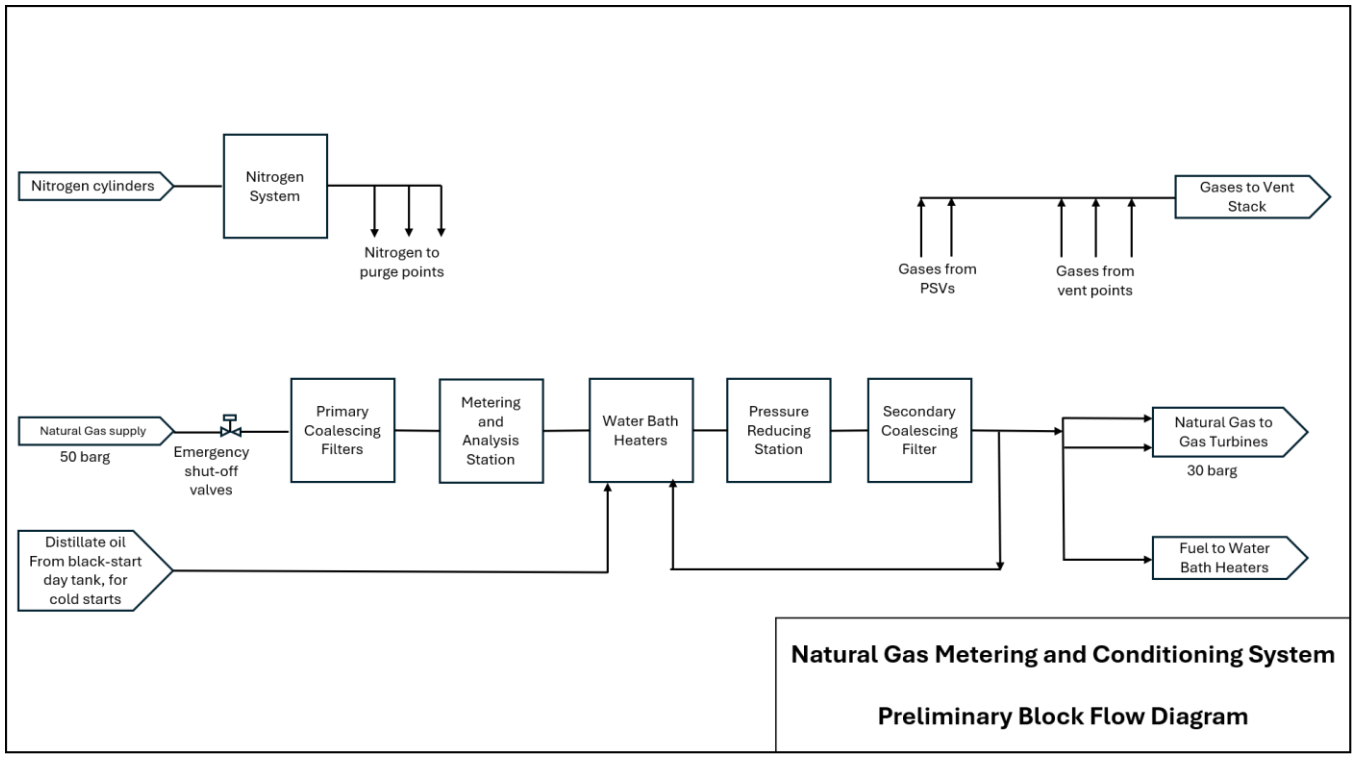


Figure 12: Natural Gas Metering and Conditioning System

9.5.3 Plant Process Cycle Arrangement

The Plant will be designed for base load operations at 500MW in Simple Cycle and 750MW in Combined Cycle on twenty-four hours a day, seven days a week basis.

The Plant will be based on a “2+2+1 combination” comprising of two gas turbines (the “Combustion Turbine”) each with a dedicated HRSG to generate and supply steam to a shared steam turbine (the Combustion Turbine, HRSG and steam turbine are together known as the “Power Plant”). Generators attached to each of the Combustion Turbines and steam turbines will supply electrical power to the grid via transformers and a switchyard.

Ambient air is drawn into the compressor element of the Combustion Turbine through the air inlet filtration and silencing system. Fuel is fired in the combustion section, and the resulting hot exhaust gases then expand through the turbine element, spinning the rotor and generator connected directly to it via a reduction gearbox.

The Combustion Turbine has two functions, namely:

- To produce electrical power through the generator; and
- To supply hot gases to the HRSG.

The exhaust gases from the Combustion Turbine will pass through the HRSG, where the heat will be used to generate steam. The gases will then exhaust through the rear HRSG stack.

The HRSG forms the link between the Combustion Turbine and the steam cycle. It is proposed that a horizontal gas flow type waste heat recovery boiler is used for ease of future access and maintenance. The proposed HRSG model utilizes a triple pressure, reheat configuration (subject to final engineering) with exhaust gases flowing through the HRSG.

During maintenance or other shut-down of the proposed HRSG model, exhaust gases from the Combustion Turbine will be diverted through the bypass stack, precluding steam generation, but still enabling the Combustion Turbine to continue to generate power to the grid.

The steam generated in the HRSG is then distributed to the steam turbine. High-pressure (HP) steam is supplied directly to the steam turbine inlet and after passing through the HP stage is returned to the boiler for reheating with the intermediate steam and then introduced in the intermediate steam turbine. Finally the Low-pressure (LP) steam enters the steam turbine through a second admission steam pressure controller. The steam expands through the steam turbine sections causing the rotor to spin and generate electrical power through the generator connected directly to it. The steam exits the steam turbine through an exhaust system connected to a condenser, where the steam is returned to a condensate / liquid state after being cooled. The condensate is pumped from the condenser and returned to the HRSG where the steam generating cycle process starts again.

Diagrams explaining the operation of a CCPP are provided in Figure 13 and Figure 14 below.

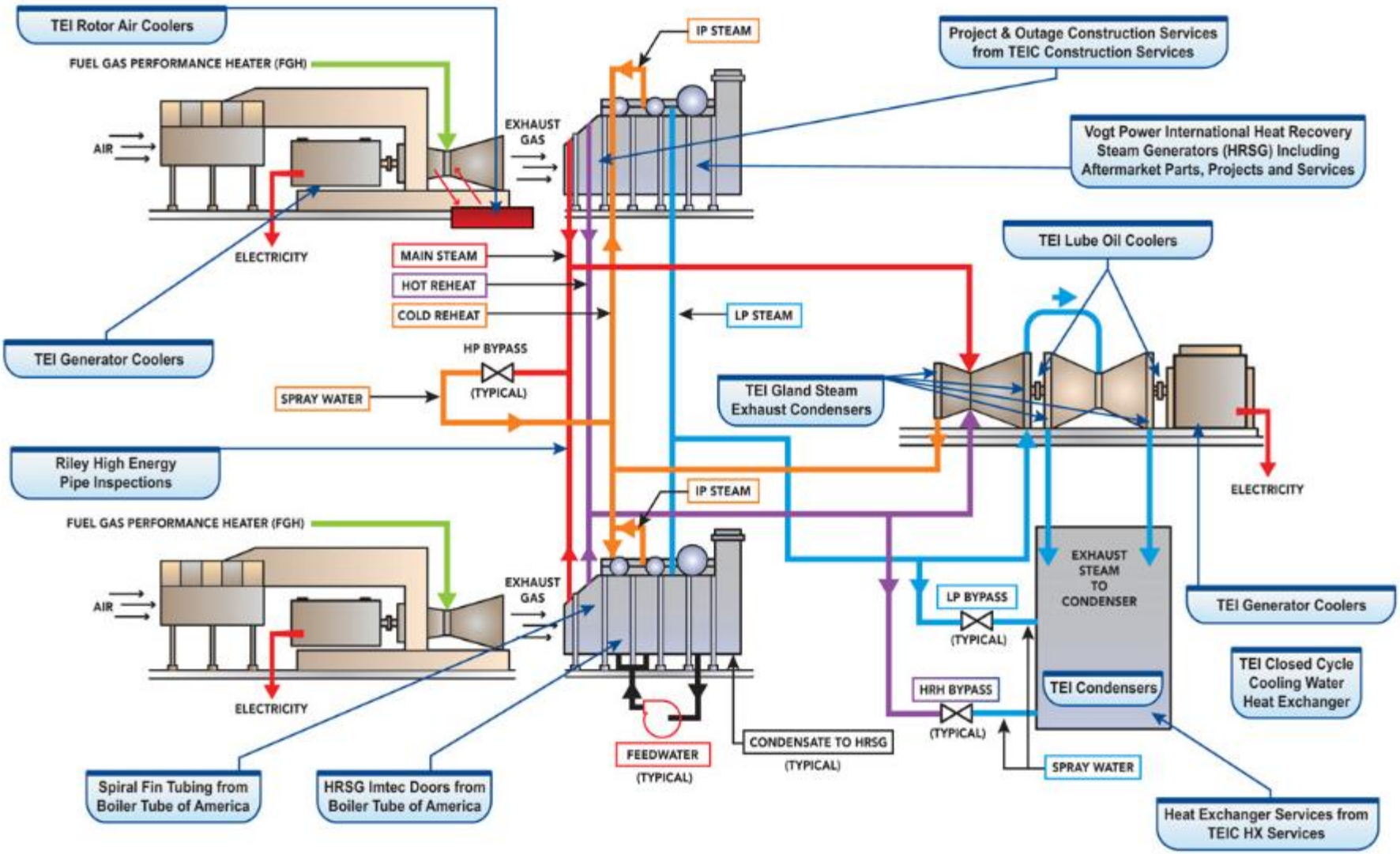


Figure 13: Diagram showing typical components of a CCPP

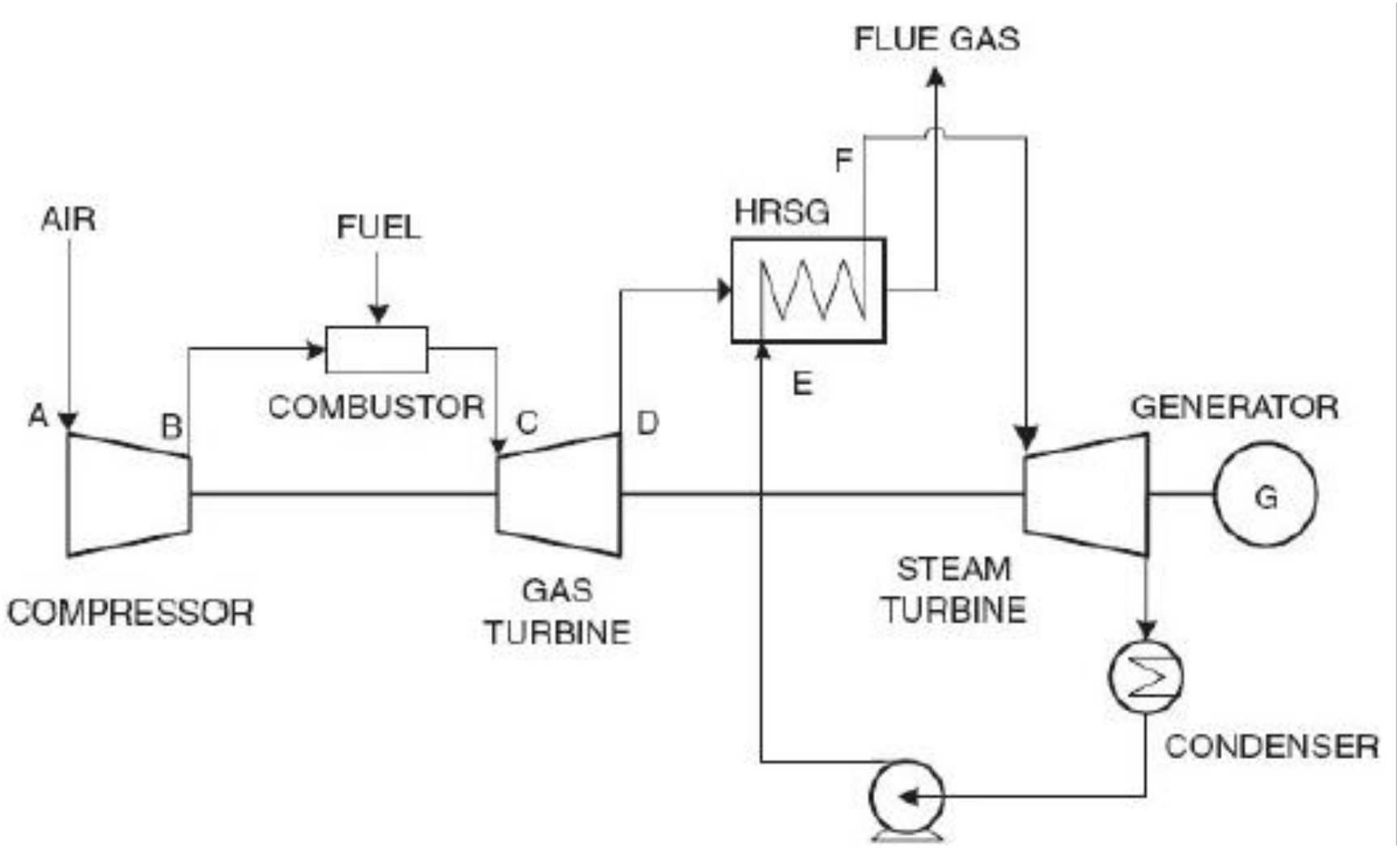


Figure 14: Schematic flow diagram of CCPP

9.5.4 Gas Turbines

The proposed Plant will comprise two (2) heavy-duty, 50 Hz, F-class gas turbines arranged in a 2+2+1 combined cycle configuration, but the specific gas turbine has not yet been selected.

The turbines currently under consideration are the General Electric (GE) 9F.03 and the Siemens Energy SGT 5-4000F units. Plant performance modelling completed to date has been based on the Siemens Energy SGT5-4000F, with either the SGen5-2000P or SGen5-2000H generator.

The final gas turbine and generator selection will be confirmed during detailed design based on availability and performance, and the associated performance figures will be updated accordingly.

Table 11 and Table 12 below show the turbine and plant performance parameters respectively.

Table 11: Gas turbine indicative parameters

PARAMETER	VALUE
Frequency	50 Hz
Simple cycle power output	240 to 300 MW
Simple cycle efficiency	39.5%
Heat rate	9,114 kJ/kWh
Exhaust temperature	614 °C
Exhaust mass flow	2496 t/h

Table 12: Plant performance (Lower Heating Value basis)

PARAMETER	VALUE	UNIT
Net fuel / energy input (LHV)	1 521 909	kW
Gross heat rate (LHV)	6 072	kJ/kWh
Net heat rate (LHV)	6 236	kJ/kWh
Gross electric efficiency (LHV)	59,28	%
Net electric efficiency (LHV)	57,73	%

9.5.5 Water Systems

Cooling systems are the highest water consumers and for this plant there are two main possibilities, namely an evaporative cooling-tower based system using water, or a dry cooling system using air-cooled radiators (fin-fan heat exchangers).

In general, a cooling-water solution provides for higher overall efficiency (~1.1% improvement) and slightly lower emissions than the air-cooled case. There are however various trade-offs, and the cooling modality will be finalised during the Feasibility Study phase.

From an EIA perspective, the cooling-tower solution consumes vastly more water and has a higher effluent load than the dry cooling case, and so it is the cooling-tower solution that is presented here.

9.5.5.1 Water Requirements

The plant's maximum expected water requirements for the cooling-tower solution during normal operations are listed in Table 13.

Table 13: Proposed Plant's water requirements (Water-cooled case)

SERVICE DESCRIPTION	L/d
Demineralised (DM) water requirement (litres per day)	256,000
Service water requirement (litres per day)	48,000
Potable water requirement (litres per day)	6,000
Cooling water make-up requirement (litres per day)	21,000,000

Notes: Quantity indicated above is makeup requirements, as all systems are closed circuit and actual process flows are different.

The major users of water in the CCPP include the following:

- Closed cooling water system for steam turbine condenser;
- Closed cooling water system for STG and HRSG auxiliaries' systems;
- Closed cooling water for Gas Turbine, auxiliary equipment's including the hydrogen cooling of Generator;
- Power Cycle make-up demin water (HRSG make-up);
- Potable and service water systems; and
- Fire Water system.

For the air-cooled case, the only significant change is that cooling water makeup will be reduced to a very small flow, or zero.

9.5.5.2 Water Supply

The Applicant and the RBIDZ have been in discussions with uMngeni-uThukela Water (UUW) regarding the water requirements of the Plant and how these requirements will be satisfied..

The RBIDZ will provide two sources of water to the site, namely:

- Potable municipal water; and
- Clarified water.

The RBIDZ has confirmed (document dated 23 July 2026) (see letter contained in **Appendix D**) that 416 m^3/d of potable water is available for the plant. This is sufficient to meet the potable water, service water and Demin Water Plant feed requirements.

The entire water requirement for the air-cooled case can therefore be met by the potable water system, as confirmed by RBIDZ.

The water-cooled case requires the above quantity of potable water, plus an additional 21 000 m^3/d of cooling-water makeup. RBIDZ has confirmed that this cannot be satisfied from the potable water network and that clarified water must be used for these purposes, or another source should be found.

The RBIDZ will be providing a dedicated clarified water distribution network for industrial users. One system will soon be commissioned and can provide 22 to 27 000 m^3/d, while a network currently under construction will provide another 110 to 137 000 m^3/d. Given that there are other consumers of clarified water, the RBIDZ has confirmed that the Project's 21 000 m^3/d clarified water requirement cannot be satisfied under current plans.

The RBIDZ has, however, informed the Project that it would be possible to execute bulk water infrastructure upgrades in order to supply the volume of clarified water required by the water-cooled case.

Water from the terminal point will, if necessary, be filtered, possibly in a backwashing system (probably a sand filter) to remove any solids in the water. This backwash will be sent to the Wastewater Monitoring Sump for monitoring and testing before being discharged.

The filtered water will be stored in a combined Service and Firewater Tank with a nominal volume of approximately 5 000 m^3. This tank will be structured such as to reserve the bottom portion of the tank for fire water service only.

The remainder of the tank will supply the necessary service water and Demin Plant feedwater to the plant. Service water is used for miscellaneous plant services including washing and cleaning needs.

Provision is made in the design of the Plant for a raw service water storage capacity of two-days of consumption, or 800 m^3. This is in addition to the firewater reserve.

The water requirements of the proposed Plant will be met as shown in Table 14.

Table 14: Water supply to the Plant

WATER SERVICE	SOURCE	L/d
Potable water	RBIDZ potable water system	6,000
Service water	RBIDZ potable water system	48,000
Demin Plant feed water	RBIDZ potable water system	341,000
Possible cooling tower makeup	RBIDZ Clarified water system	21,000,000

9.5.5.3 Demineralised Water Plant

Demineralised water is required for the steam systems, in particular the HRSG.

The concentration of dissolved solids in the HRSG drum water gradually increases due to concentration caused by evaporation. To control the carry over by steam, this concentration level has to be maintained by blow down of drum water. This blow down must be replaced, and Demin Water is used for this purpose. Small volumes of Demin Water are also used elsewhere in the plant, such as in the laboratories.

The Demineralised Water Plant will likely consist of a reverse osmosis (RO) system combined with a mixed-bed ion-exchange system with two trains, each covering 100% of the normal demand of the plant. A reject brine stream of 25% of the feed to the RO and Demin Plant is assumed.

A Demin Water Tank of 600 m^3 will be provided to store two days' consumption. This tank will be nitrogen blanketed to prevent air exchange and demin water deterioration.

The resin beds in the demin plant will regularly need to be regenerated. For this, hydrochloric acid (typically 30%) and a caustic soda solution (typically 30-50%) is required. The demin water treatment plants will have a dedicated chemical storage area, make up and dosing facility.

Small volumes of other water treatment chemicals, such as sodium bisulphite, may also be required, in accordance with OEM recommendations, but this will depend on the quality of the raw water received.

All wastewater from the regeneration operations will be directed to the Neutralization Sump for chemical neutralization before discharge.

9.5.5.4 Cooling Water System

A closed loop cooling system with cooling towers is presented in this document. The alternative is to use a dry, air-cooled solution and the water requirements and related effluent for this case would be vastly lower than presented here.

As water in the cooling water circuit evaporates in the cooling towers, solids, salts and other contaminants are concentrated and must be removed via a blowdown stream. The evaporated water and the blowdown must be replaced and this is termed cooling water makeup.

Algae growth in the cooling water circuit must be managed and this is primarily done by dosing with chlorine and typically around 60 kg/day of Cl_2 will be required.

This can be achieved through sodium hypochlorite (NaOCl) dosing and for this around 420 L/d of a 12.5% solution would be required. This would be stored in a suitably bunded HDPE or rubber-lined tank, with around 15 m^3 of product being stored on site.

An alternative is to produce the hypochlorite on site using an electro-chlorination plant. Such a plant uses a brine solution (NaCl) to produce hypochlorite on demand and eliminates the need to store sodium hypochlorite on site. This unit would require around 180 kg/d of sodium chloride and so around 5 000 kg of sodium chloride will be stored on site if this option is selected during detailed design.

Small amounts of biocide will also be periodically dosed, as required.

9.5.5.5 Firewater System

The hydrant fire water protection system covers different plant areas and spray water for the transformers and other areas as per code will be met by the dedicated fire protection system comprising the Service and Firewater Tank, firewater pumps, including an emergency diesel fuelled pump, and the firewater pipe network.

9.5.5.6 Drainage

The drainage system will be designed to cope with surface water, maintenance and normal plant flows, oil contamination and oil drainage or spillages and blowdowns.

Flooring of all enclosed buildings and cable / fuel and other trenches will be designed and graded to ensure there is no accumulation of water at any time.

The oily water drainage system will be provided for all floor drains and plant areas and areas subject to oil spillage and or leaks. Oily water effluent shall be passed though oil interceptors or oil/water separators and monitored before discharge to the wastewater monitoring sump, and finally to the RBIDZ sewer. CoU's requirements will be adhered to.

9.5.5.7 Stormwater

Stormwater falling in areas not susceptible to contamination by oil or chemicals will be routed directly to the RBIDZ stormwater system.

RBIDZ has confirmed that stormwater infrastructure exists (see letter contained in **Appendix D**). Connection arrangements for the site will be confirmed during the detailed engineering design stage and shall be undertaken in accordance with RBIDZ development standards.

Any rainwater falling in bunded areas or areas susceptible to oil contamination will be routed to the oily water drain system. Bunded areas will have sumps to hold the rainwater and a valve so that the oily water flow to the oil-water separator can be managed.

Similarly, all areas susceptible to chemical contamination will be drained to the neutralisation sump.

9.5.5.8 Domestic Sewage

The Plant's domestic sewage will be discharged into the sewage system of the RBIDZ, which feeds into the municipal sewer network. Discharge will comply with the applicable municipal requirements.

9.5.5.9 Oily Water Separator

All oil waste effluents and water drained from bunded areas where oil leaks or spillages are possible will be collected into a separate network, the oily water drain, and routed to a holding tank and an oil-water separator. This would include contaminated wastewater from turbine washing, floor washing and other processes.

Oil sludge removed from the oily water will be collected in a sump and periodically removed from site by vehicle to a suitable treatment facility.

The oil-free water will be routed to the Wastewater Monitoring Sump.

9.5.5.10 Neutralising Sump

Wastewater generated by the Demin Plant resin bed regeneration process as well as the brine from the RO systems will be routed to the Neutralising Sump where the pH will be corrected using either a caustic or a hydrochloric acid solution. Water from areas susceptible to chemical; contamination will also be routed to the neutralising sump.

Neutralised water will be routed to the Wastewater Monitoring Sump for final monitoring prior to discharge.

9.5.5.11 Wastewater Monitoring Sump

This sump is the final point of capture and discharge. It will be typically sized to capture the first 10 minutes of a major downpour to retain the worst of the stormwater runoff for further treatment.

Water from the oil-water separator and from the neutralisation sump will be routed to the wastewater monitoring sump where it is continuously monitored for pH, Total Dissolved Solids (TDS) and other parameters, as required before discharged to the RBIDZ sewer.

The aim of the pond is to provide a final stage of measurement and monitoring of wastewater before it is discharged. All discharged wastewater will be measured and recorded. Should poor quality water arrive in the Wastewater Monitoring Pond it can be captured, prevented from being discharged and returned for the necessary treatment.

The wastewater discharge will comply with the limits outlined in the CoU Water Services By-laws and the applicable Trade Effluent Discharge Standards. Prior to connection to the sewer network, detailed process designs, hydraulic calculations, anticipated influent and treated effluent quality,

monitoring proposals and all relevant approvals will be provided for review and approval by the relevant authorities.

If the water-cooled option is selected, it may be necessary to upgrade the domestic sewer system within the RBIDZ.

9.5.5.12 Water System Equipment Summary

The most important of the water system equipment and systems are shown in Table 15. The exact types of equipment and the sizes and other specifications thereof will be determined during the Feasibility Study phase.

Table 15: Main water system equipment

ITEM	SERVICE	NOTES
Water Pre-Treatment	Filter and/or clarify incoming water	Sand filters, possibly clarifier 409 m^3/d
Service, Fire and Raw Water Tank	Store fire-reserve and 2 days of water	5 000 m^3
Demin Water Plant	Produce demineralised water	Likely RO and mixed-bed ion exchange system 256 m^3/d Demin Water produced
Demin Water Tank	Store Demin Water	Nitrogen blanketed 600 m^3
Oily Water Collection Tank or Sump	Collect water from areas where oil leaks or spills might occur	20 m^3
Oily Water Separation System	Separate oil from wastewater	5 m^3/hr
Waste Oil Collection Sump	Hold separated oil for collection	5 m^3
Neutralisation and Filtration Sump	Neutralisation of effluent	Nominally 100 m^3
Wastewater Monitoring Sump	Continuous monitoring of effluent	Nominally 100 m^3
Electro-chlorination Plant (possible)	Produce hypochlorite for cooling tower algae and bacteria control	60 kg/d Cl_2 requiring 180 kg/d of NaCl

9.5.6 Plant Electrical System and Evacuation

The high voltage (HV) transmission system, into which the Plant power will be evacuated, is rated at 400 kV. The configuration described is what the Mabasa Thermal Power Plant requires. There may be additional requirements from Eskom.

The preliminary combined Eskom/Mabasa Switching Station and Mabasa Thermal power Plant single line diagram is shown in Figure 15 belowMabasa Switching Substation Preliminary Configuration. Typically, a dedicated Eskom Switching Station / Control Equipment building is required in the Eskom portion of the substation yard and will be about 6m x 5m in footprint.

Each of the Combustion Turbine generators (CTG) and the Steam Turbine Generator (STG) will be connected to its respective generator step-up transformer (GSU) via isolated phase bus (IPB) duct, and the unit auxiliary transformers (UAT) will be connected, “T-off”, from the CTG IPBs.

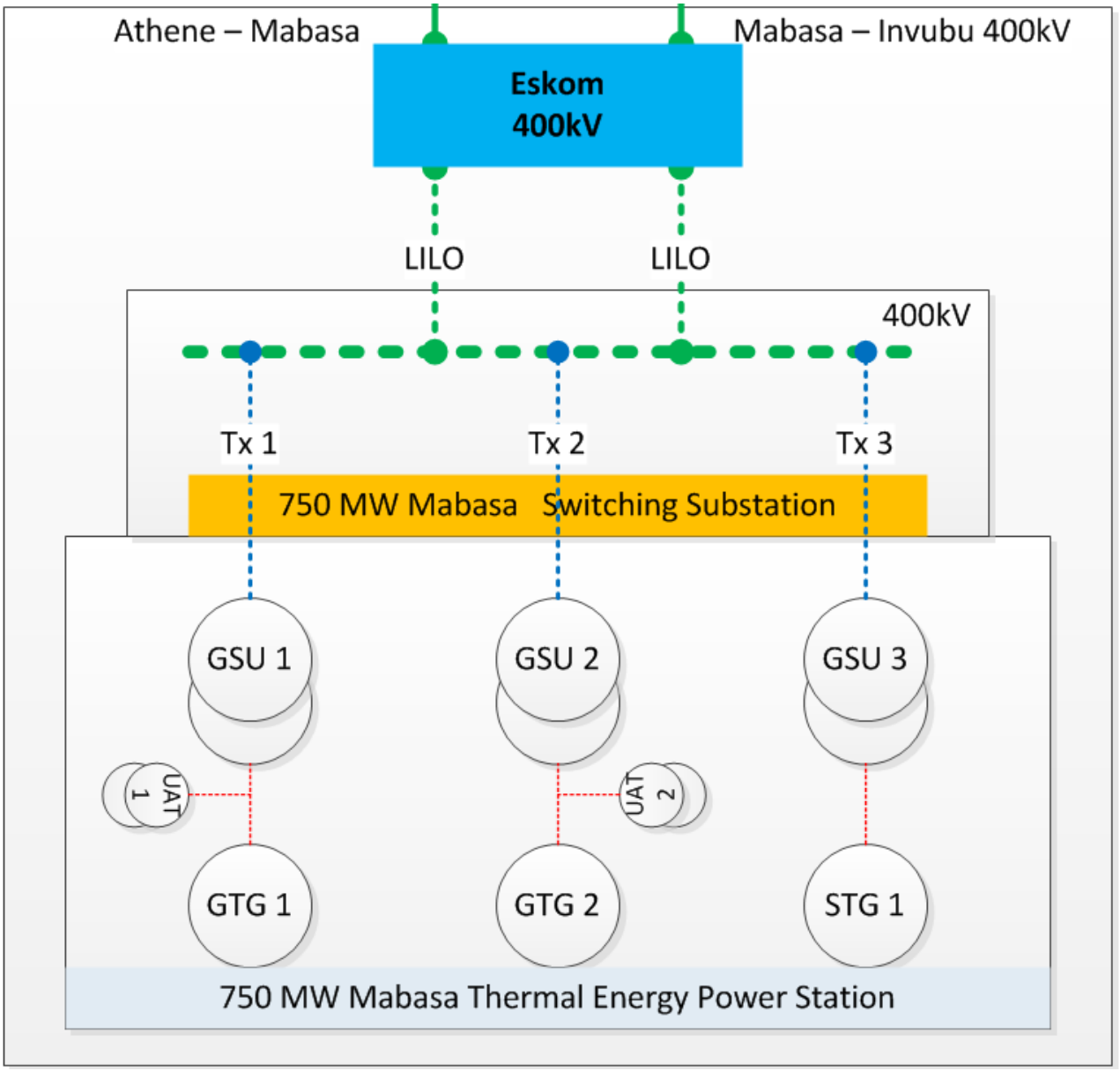


Figure 15: Mabasa Switching Substation Preliminary Configuration

The Plant will have an open-air 400 kV switchyard with three (3) collector / transformer bays. The switchyard will house the equipment and major systems as listed below:

- Mabasa Thermal Power Plant HV / MV section –
  - Three (3) 400 kV transformer feeder bays;
  - High voltage switchgear (400 kV), Circuit Breakers / Isolators / Earthing Switches;
  - Current and Voltage Transformers;
  - Surge & Lightning Arrestors;
  - Three (3) oil filled generator step-up transformers (GSU) to increase the voltage from 15 kV to 400 kV;

- Two (2) oil filled unit auxiliary step-down transformers (UAT) to decrease the voltage from 15 kV, the choice: 11 kV or 6.6 kV or 3.3 kV will be determined in the detailed final design to accommodate motors with power consumption equal to or exceeding 250 kW; and
- Two (2), Neutral Compensating Earth Resistors (NECR) / Neutral Earth Resistors (NER) will be associated with the individual UATs (NECR / NER will be determined and finalised during the detailed final design).

❑ Eskom section –

- Eskom Control / Equipment building;
- Two (2) 400 kV feeder bays;
- High voltage switchgear (400 kV), Circuit Breakers / Isolators / Earthing Switches
- Current and Voltage Transformers
- Surge & Lightning Arrestors
- 400 kV Busbars system
- 400 kV Bus coupler
- Three (3) 400 kV transformer feeder bays.

A layout of a typical 400 kV switching station is shown in Figure 16 below.



Figure 16: Photograph of a typical switchyard

This S&EIR Process excludes the development of the grid connection infrastructure.

9.5.7 Instrumentation and Control

A distributed control system (DCS) will be used for the overall operation and control of the power plant. The DCS will be situated in a control room and will manage the combustion turbines, steam turbine, HRSGs and other systems as required. The DCS is a real time system that provides

automatic operation, control, monitoring and data trending and logging of all plant processes by means of a control system which will provide for programmed sequence and analog control.

The DCS will continuously monitor and adjust the parameters of the plant process systems. Data is used by the DCS to determine whether the various processes are operating correctly, to identify any alarm conditions and to generate operating and management reports.

The DCS can be designed to automatically control the operation of all process component systems, providing effective control over design operating ranges. The DCS can also provide the control room operator interactive control stations. The operator can utilise the control stations for process system operations including start-ups, shutdowns and modification of operating parameter limits.

For the Combustion Turbine, the DCS will be supported by condition performance monitoring software that will relay historical performance data to the engineers. The engineers will interpret the data and provide recommendations to the Plant operators on:

- Combustion Turbine optimisation and efficiency; and
- Advising on solutions to minimise unplanned shutdowns and avoid critical failure of the turbines.

A typical control room is shown in Figure 17: Example of a control system at a CCGT PlantFigure 17 below.



Figure 17: Example of a control system at a CCGT Plant

9.5.8 Fire Protection

9.5.8.1 Introduction

The Plant will be equipped with a dedicated fire detection, protection and suppression system to safeguard personnel, plant and equipment and to limit the consequences of a fire or gas release.

The system will be designed in accordance with recognised international and national codes and standards, including NFPA 850 (Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations), the associated NFPA standards referenced below, the applicable SANS codes, the Occupational Health and Safety Act (Act No. 85 of 1993) and its regulations, the Major Hazard Installation Regulations, and the local municipal fire by-laws. A site-specific fire risk assessment will be undertaken during detailed design to confirm the extent and rating of each protection measure.

9.5.8.2 Fire Hazards and Design Basis

The principal fire and explosion hazards on site are associated with the natural gas fuel supply and conditioning system, the gas turbines and their lubricating oil systems, the generators (including the hydrogen cooling system where a hydrogen-cooled generator is selected), the power and station transformers, the diesel fuel where the dual fuel or backup diesel option is implemented, cable galleries, and the buildings. The fire protection philosophy is based on early detection, automatic isolation of the fuel source, containment and suppression of the fire, and safe evacuation of personnel. Areas handling flammable gas or liquids will be classified as hazardous areas and all electrical, instrumentation and control equipment installed in these areas will be certified for the applicable hazardous area classification.

9.5.8.3 Fire Detection and Alarm System

An addressable fire detection and alarm system will monitor the Plant continuously. Heat, smoke and flame detectors will be provided in buildings, equipment enclosures and process areas as appropriate, and dedicated hydrocarbon gas detectors will be installed in the fuel gas conditioning area, the gas turbine enclosures and any other area where a flammable gas accumulation is credible. Manual call points will be located along escape routes. The system will be annunciated at a fire alarm panel in the central control room and interfaced with the plant distributed control system (DCS) and emergency shutdown (ESD) system, so that confirmed gas or fire detection automatically initiates alarms, isolates the fuel supply and, where applicable, releases the fixed suppression systems.

9.5.8.4 Firewater Storage and Supply

Firewater will be drawn from the on-site freshwater storage reservoir. Provision is made in the Plant design for a freshwater storage reservoir with a two-day storage capacity of approximately 5000 m^3, which will also serve as the dedicated firewater source. The worst-case firewater demand is governed by the largest single fixed suppression system, being the transformer water-spray system, operating together with the hose-stream allowance, and is estimated at up to approximately 6 000 litres per minute (about 360 m^3/hr). In accordance with NFPA 850, the firewater supply is sized to sustain this maximum demand for a minimum of two hours, which gives a dedicated firewater reserve of approximately 720 m^3. This reserve is ring-fenced within the 5 000 m^3 reservoir so that the volume required for firefighting is always available and cannot be drawn down by normal plant consumption. Firewater is a stored reserve rather than a continuous consumer of water: it is

drawn only during a fire event or periodic testing, so apart from the initial fill and minor make-up for testing and evaporation it does not add materially to the ongoing water consumption of the Plant.

9.5.8.5 Firewater Pumping System

The firewater pumps will be housed in a dedicated firefighting pump house of steel construction. The pumping arrangement will comprise an electric motor-driven jockey pump to maintain the ring main under constant pressure and two full-duty (100%), one electrically driven and the other diesel-engine driven, each independently capable of meeting the full firewater demand so that firefighting capacity is maintained with the electrical supply to the site lost. On a worst-case basis adopted for the purposes of this assessment, each pump engine is rated up to approximately 300 kW, with a diesel fuel consumption of up to approximately 80 litres per hour at rated load, and each pump is provided with a dedicated diesel day tank sized in accordance with NFPA 20 for a minimum of eight hours of continuous operation. This gives a diesel storage volume of approximately 2 500 litres per pump, or approximately 5 000 litres in total for the two firewater pumps. These worst-case figures are adopted so that the declared hazardous materials inventory will not be exceeded in operation; final pump ratings, flow and fuel volumes will be confirmed during detailed design. The diesel inventory is accounted for in the Hazardous Materials inventory.

9.5.8.6 Firewater Distribution, Ring Main and Hydrants

A pressurised firewater ring main will be routed around the Plant buried underground. Fire hydrants, hose reels and fire monitors will be positioned along the ring main to provide coverage of all plant areas in accordance with the applicable codes. Isolating valves will be provided so that sections of the ring main can be isolated for maintenance without loss of overall coverage.

9.5.8.7 Fixed Suppression Systems

Fixed suppression will be provided according to the hazard of each area. A water spray (deluge) system to NFPA 15 will protect the power and station transformers and the switchyard. A total flooding carbon dioxide (CO_2) system to NFPA 12 will protect the gas turbine and generator enclosures; the CO_2 is held in a low-pressure storage of the order of 10 tonnes located on an outdoor skid adjacent to the turbine block. Automatic sprinkler systems to NFPA 13 will protect the offices and other occupied buildings.

The diesel fuel storage tanks and their bunded area will be protected by a fixed low-expansion foam system designed to NFPA 11. Each storage tank will be fitted with top-mounted foam chambers (foam pourers) on the tank shell that discharge foam onto the fuel surface to control and extinguish a tank fire, and the bund will be provided with foam pourers or foam generators to blanket the bund floor in the event of a spill or bund fire. Foam will be supplied from a dedicated foam concentrate store and proportioning skid (bladder tank or foam pump unit), sized for the largest single risk at the required application rate and discharge duration, using a fluorine-free foam concentrate. The road-tanker offloading point will be given supplementary protection by foam or water monitors and by portable and wheeled foam or dry chemical extinguishers. Application rates, foam chamber

numbers and concentrate volumes will be confirmed to NFPA 11 during detailed design. In addition, the bulk diesel storage tanks will be provided with fixed water-spray cooling rings (tank shell cooling) to NFPA 15, fed from the firewater ring main, which spray water over the shell of any tank exposed to an adjacent fire to maintain its integrity and prevent escalation. The tank foam and shell-cooling systems are designed to operate together.

9.5.8.8 Portable Equipment and Emergency Facilities

Portable and wheeled fire extinguishers, fire blankets and hose reels will be distributed throughout the Plant and buildings in accordance with the applicable SANS requirements. Clearly marked escape routes, emergency lighting and designated emergency assembly points will be provided, and the fire protection system will be integrated with the site emergency response plan.

9.5.9 Vehicular Traffic During Normal Operations

9.5.9.1 Staff Traffic

During normal operations, the plant will be staffed on a continuous shift basis.

Weekday daytime staffing is estimated at approximately 30 - 35 personnel, comprising shift operations crew, maintenance technicians, engineering, and administrative staff. Night shift and weekend staffing reduces to approximately 15 personnel, reflecting a leaner operational crew covering control room, field operations, and site security functions outside standard business hours.

Assuming a light-vehicle occupancy of approximately 1.2-1.5 persons per vehicle (typical for industrial site commuting patterns, given limited carpooling/shuttle uptake), this equates to approximately 20-25 light vehicle trips onto site during the weekday morning shift change, with a corresponding outbound movement at shift end, and a reduced volume of approximately 10-13 vehicle trips associated with night and weekend shift changes. Shift changeovers are expected to occur at fixed times (typically two or three shift changes per 24-hour period), concentrating staff traffic into short peak windows rather than distributing evenly across the day.

9.5.9.2 Traffic - General

Delivery traffic during normal operations will consist of routine consumables and periodic bulk chemical/fuel replenishment, together with lower-frequency deliveries such as spare parts, general stores, and waste removal. Bulk hazardous material deliveries are expected to be the dominant contributor to vehicle movements associated with the facility, given the relatively small permanent workforce.

Delivery scheduling for bulk chemicals will typically be arranged around minimum on-site storage thresholds (reorder points) rather than a fixed daily schedule.

9.5.9.3 Hazardous Materials Delivery Traffic

Nitrogen, hydrogen and carbon dioxide, required in relatively small on-site quantities for purging/blanketing and generator cooling respectively, are supplied as compressed gas in cylinder bundles or tube trailers, delivered by specialised gas-supply vehicles at low frequency given the modest storage volumes involved.

Distillate fuel oil, comprising both the large-volume natural gas backup reserve and the smaller emergency generator supply, is delivered by bulk fuel tanker; however, as this fuel functions as a strategic reserve rather than a continuously consumed process fluid, routine delivery frequency during normal operations is expected to be low, limited to periodic top-ups following testing or minor losses, rather than the high-frequency tankering that would be associated with continuous dual-fuel firing.

Lubrication oil, hydraulic oil, and transformer oil are delivered in drums or by small bulk tanker respectively, at low frequency, reflecting their role as sealed-system fluids subject to periodic top-up rather than continuous consumption.

Water treatment chemicals - caustic soda, hydrochloric acid, ammonia, and phosphate solutions - are delivered by dedicated chemical bulk tanker on a cyclical basis tied to on-site storage reorder points, driven by demineralisation plant regeneration frequency and boiler water chemistry dosing rates.

Sodium chloride for the electro-chlorination plant is delivered in bulk bags by flatbed truck on an approximately monthly cycle, consistent with the plant's calculated consumption rate relative to on-site storage capacity.

Vehicular traffic associated with hazardous material deliveries is summarised in Table 16 below.

Table 16: Hazardous material vehicular deliveries

Material	Delivery Mode	Vehicle Type	Estimated Frequency
Nitrogen	Compressed gas cylinder bundle	Gas cylinder delivery truck	~1 per month
Hydrogen	Compressed gas cylinder bundle / tube trailer	Gas cylinder delivery truck	~1 per month
Carbon dioxide	Compressed gas cylinder bundle / tube trailer	Gas cylinder delivery truck	Very infrequent
Distillate fuel (possible NG backup)	Bulk tanker	Fuel road tanker (~30–36 m³ capacity)	~1–2 per month (top-up only; assumes reserve rarely drawn down in normal ops)
Distillate fuel (emergency gensets)	Bulk tanker	Fuel road tanker / bowser	~1 per month (top-up after testing)
Lubrication oil	Drums (200 L)	Flatbed/panel van	~1 per quarter
Hydraulic oil	Drums	Panel van	~1–2 per year
Transformer oil	Bulk tanker	Fuel/oil road tanker	Negligible in normal ops (sealed system; occasional top-up only)

Material	Delivery Mode	Vehicle Type	Estimated Frequency
Caustic soda, 40%	Bulk tanker	Chemical tanker	~1 per month
Hydrochloric acid, 30%	Bulk tanker	Chemical tanker (dedicated acid service)	~1 per month
Ammonia, 20–30%	Bulk tanker or IBC/flowbin	Chemical tanker or flatbed (multiple IBCs)	~1 per month
Phosphate, 5–10%	IBC/flowbin	Flatbed truck	~1 per month
Sodium chloride (possible)	Bulk bags (1 t bags)	Flatbed truck	~1 per month
Sodium Hypochlorite (possible)	25 kg bags, palleted	Flatbed truck	~1 per month

9.5.9.4 General (Non-Hazardous) Delivery Traffic

In addition to the hazardous materials deliveries detailed above, normal plant operations will generate a lower-intensity stream of general delivery and collection traffic. This includes spare parts and consumable items (filters, gaskets, PPE, general maintenance stores) delivered by courier or light delivery vehicle on an as-needed basis, typically several times per week given the ongoing nature of routine maintenance activity.

General (non-hazardous) waste collection, covering domestic-type waste from staff facilities (canteen, ablutions) and general industrial waste (packaging, scrap materials), is expected to occur on a scheduled basis, typically weekly, via a standard municipal or contracted waste collection vehicle.

Courier and light postal/administrative deliveries occur at low volume on a near-daily basis but represent light vehicle trips of negligible traffic impact relative to the heavy vehicle movements associated with bulk chemical and fuel deliveries. The general delivery traffic is summarised in Table 17 below.

Table 17: General delivery traffic

Category	Delivery Mode	Vehicle Type	Estimated Frequency
Spares/consumables	Courier / palletised goods	Light delivery van / small truck	2–3 per week
General waste collection	Skip / wheelie bin collection	Waste collection truck (compactor or skip truck)	1 per week
Courier/admin	Small parcel delivery	Light vehicle	Near-daily (negligible traffic impact)

9.5.9.5 Water Treatment Sludge and Oil-Water Separator Collection

In addition to inbound delivery traffic, normal plant operations will generate periodic outbound collection traffic associated with waste streams from the water treatment and site drainage systems.

Sludge generated by the demineralisation plant's neutralisation process (from acid/caustic regeneration effluent) and, from raw water filtration, will be periodically removed from site, either as dewatered material collected by skip truck or as liquid/thickened sludge removed by vacuum tanker, depending on the final dewatering arrangement adopted.

Collection frequency is expected to be low, in the order of once per month, tied to sludge accumulation rates rather than a fixed process consumption schedule.

Similarly, hydrocarbon sludge recovered by the site's oil-water separator — accumulated tramp oil and hydrocarbon skimmings from stormwater and wash-down drainage — will be periodically collected by a licensed waste oil recovery contractor using a vacuum tanker, at an estimated frequency of once every one to two months, based on typical accumulation rates for a site of this nature.

Both waste streams represent collection (outbound) rather than delivery (inbound) heavy vehicle movements and given their low frequency relative to bulk chemical and fuel deliveries, are expected to contribute minimally to overall site traffic volumes during normal operations. The outbound traffic is summarised in Table 18.

Table 18: Sludge and waste oil collection

Category	Delivery Mode	Vehicle Type	Estimated Frequency
Water treatment sludge removal (clarifier/neutralisation sludge)	Vacuum tanker or skip (dewatered sludge)	Vacuum tanker truck / skip truck	~1 per month
Oil recovery (oil-water separator)	Vacuum tanker (liquid) or drums (if low volume)	Waste oil recovery tanker	~1 per 1–2 months

9.5.10 Project Site and Plant Arrangement

The overall site and building arrangement has been developed to minimise space requirements while maintaining ample access for operation and maintenance activities. Erf 16673 in Phase 1F of the RBIDZ is approximately 12.7 ha in extent, which is adequate to accommodate the Plant.

The electrical switchgear and associated auxiliary equipment will be located within constructed buildings. The steam turbines will also be located within a building construction (the “Steam Hall”).

All other major equipment will be designed for outdoor use.

Sufficient operations, administrative and support facilities are considered. A central control room provides a controlled environment to protect sensitive electrical equipment and for operators to monitor and control plant functions. A main office will accommodate Plant management and administrative staff with associated facilities. All offices will have parking areas in front.

A demineralised water storage tank and system will provide boiler feedwater to the HRSG’s and make up water to closed cycle cooling water system. The Cooling Water Plant will include an induced draft cooling tower system for catering to cooling water requirements of the steam turbine condenser. The closed cooling water system shall consist of plate heat exchangers and pumps,

shall cater the cooling water system needs of Gas Turbine Generator (GTG) auxiliaries, STG auxiliaries and the HRSG auxiliary systems.

The Plant will have a dedicated fire protection system comprising of water storage, pumping system and pressurised ring main complete with fire hydrants positioned along the ring main, firefighting equipment, a sprinkler system for the offices, fire extinguishers and a deluge system for the switchyard.

Site access roads will permit normal operations and lay-down areas / access adjacent to major equipment to facilitate maintenance. Roads, including ducting and open drains and ditches crossing below a road, will be designed considering axel loads and tuning circles of large trucks and mobile cranes.

The Plant will have adequate drainage to remove surface water from the site. Oily water separators positioned around the site will collect any spillage and or wash from maintenance operations on key equipment. The oily water separators will be designed to discharge grey water into the drains treated to a satisfactory quality level.

Fencing will be provided around the perimeter of the HV switchyard and the Plant perimeter. Appropriate lighting and security system will be provided.

Potable water, telecommunications, power evacuation and sewage system raw water / sanitary waste are available at the proposed Plant site boundary, as provided by the RBIDZ.

9.5.11 Site Works

9.5.11.1 General

The construction phase of the Plant will require direct employment of over 300 local construction / technician personnel and sub-contractor companies.

The civil works will be undertaken by a suitably qualified local contractor, involving the supply of all machinery, plant, materials tools, equipment, labour, design and supervision necessary for the execution of the works, completion and the removal of all plant, equipment, materials, tools and debris etc. from the site.

Preliminary works include design and studies to be performed including:

- Confirmation of project area, establishing reference network for the Project, site survey, setting out, as built survey for the works, survey and develop construction grid;
- Soil investigation sufficient for proper foundation design, and
- Underground utilities mapping.

Site preparation works shall include:

- Site clearance
- Ground works; and
- If applicable diversion of existing utilities.

Provision shall be made for providing and maintaining necessary temporary facilities during the construction phase including:

- Signage;
- Temporary hoarding and fencing;
- Temporary laydown area;
- Temporary access roads, car parks and hard standings;
- Office facilities; and
- Portable toilet facilities.

9.5.11.2 Turbine and Generator Foundations

The foundation designs for the combustion turbine generators and steam turbine generators shall be subject to the respective equipment supplier's requirements and approvals, and will ensure that:

- The equipment will operate efficiently and reliably without unacceptable vibration or misalignment;
- The foundation itself suffers no damage or settlement sufficient to cause the equipment to malfunction or to affect alignment; and
- The waves propagated through the soil by vibration of the foundation will not be harmful to persons or adjacent structures, pipework and sensitive machinery or processes.

9.5.11.3 HRSG Foundation

The HRSG foundation will be suitably designed to withstand the equipment loading and will be constructed of reinforced concrete. If required, the foundation will be supported subject to the geotechnical study recommendations for the soil in the proposed HRSG locations. The HRSG shall be securely anchored to the foundation using supplier recommended fixings designed to resist the equipment forces.

9.5.11.4 Cooling Tower Foundations

The cooling tower foundation will be suitably designed to withstand the equipment loading and will be constructed of reinforced concrete. If required, the foundation will be supported subject to the geotechnical study recommendations for the soil in the proposed cooling tower locations. The cooling tower shall be securely anchored to the foundation using cast in place steel anchor bolts designed to resist the equipment forces.

9.5.11.5 Emergency Backup and Black Start Diesel Generator Set Foundation

Up to two backup diesel generators of small capacity are used to shut the plant down in a safe and orderly manner in the event of a plant trip scenario. A Black Start Generator might also be installed.

The back up generator foundations will be suitably designed to withstand the equipment loading and will be constructed of reinforced concrete. If required, the foundation will be supported subject to the geotechnical study recommendations for the soil in the proposed locations. Tall equipment shall be securely anchored to the foundation using cast in place steel anchor bolts designed to resist the equipment forces.

The Black Start Diesel Generator/s will have a capacity of approximately 10 to 30 MWe. These generators will only be used when a complete grid brown-out or black-out is experienced and the plant is required to start without any external electricity supply. This function is typically expected to occur 1/100 years and so there is a possibility that no Black Start Generator will be required.

9.5.11.6 Balance of Plant Foundations

The balance of plant foundations will be suitably designed to withstand the equipment loading and will be constructed of reinforced concrete. If required, the foundation will be supported subject to the geotechnical study recommendations for the soil in the proposed locations. Tall equipment shall be securely anchored to the foundation using cast in place steel anchor bolts designed to resist the equipment forces.

9.5.11.7 Generator Transformers and Station Auxiliary Transformer Foundations

Each transformer shall be supported on large reinforced concrete bases with each transformer fully enclosed by reinforced concrete “blast walls” on three sides. In addition to normal loading design requirements, the blast walls will be designed to contain and confine damage caused by explosion of the transformer as far as practical.

The fourth side will be provided with a removable palisade type fence with a lockable personnel access gate.

Proper drainage for the transformer bay(s) including an oil/water separator system for any discharge will be installed.

The compounds will be sized to permit safe working and provide room for installation, maintenance, removal and cooling of the transformer.

9.5.11.8 Steam Hall

The steam hall will be designed and constructed either of block work construction or a steel warehouse type fabrication to house the two steam turbine generators, balance of plant and pipe rack for steam and condensed water and associated systems. The steam hall will be sized to permit safe working and provide room for installation and maintenance of the steam turbines including an overhead crane.

The steam hall will incorporate a workshop, store, locker room / toilet / shower facility, laboratory and the Maintenance Managers office and an 8 Persons office. The workshop area will consist of a common maintenance bay and overhead crane.

9.5.11.9 Main Office

The main office will be designed and constructed of block work. The building shall consist of the lobby (reception area and waiting area), separate offices for operational staff, and requisite facilities.

9.5.11.10 Control Building

The control building will be a single-story design and constructed of block work. The building shall house the switchgear room, back up diesel generator, relay control room and battery room.

The building will be elevated onto piers to allow access to cable runs below the building.

9.5.11.11 Firefighting Pump House

The firefighting pump house shall be designed and constructed of steel roof structure and supported on piles. The pump house shall house the electrical equipment and firewater pumps.

9.5.11.12 Firefighting Water Tank and Foundation

The firefighting water tank shall be a steel construction, sized to satisfy the legal requirements.

The firefighting tank foundation shall be of reinforced concrete. Tank bases will be finished with a tar sand mix in accordance with design specifications.

Reinforced concrete piers will support the pipeline ring main around the power station.

9.5.11.13 Demineralised Water Tank and Foundation

The demineralised water tank shall be a steel construction. The tank foundation shall be of reinforced concrete. Tank bases will be finished with a tar sand mix in accordance with design specifications.

Reinforced concrete piers will support pipework to the HRSGs.

9.5.11.14 Diesel Fuel Storage Tanks

In the unlikely event that these tanks are required, they will be of steel construction. The foundations will be suitably designed to withstand the equipment loading and will be constructed of reinforced concrete. If required, the foundation will be supported subject to the geotechnical study recommendations for the soil in the proposed locations.

9.5.11.15 Oily Water Separators

Oil and contaminated wastewater from turbine washing, floor washing and other processes will be collected in reinforced oily water separator sumps positioned at suitable locations around the power station. Heavy duty mild steel covers including ventilation pipes with suitable hoods will be provided. Pipework will be designed to consider the overall drainage system with respect to the areas being drained.

9.5.11.16 Scrap Yard and Scheduled Waste Storage

The scrap yard and schedule waste storage area shall be a hard standing area sized to allow collection of scrap and waste, considering the manoeuvrability of large trucks.

9.5.11.17 Gas Fuel Conditioning, Forwarding and Metering Skid

The fuel conditioning, forwarding and metering skid shall be designed as a steel structure with, if necessary, a roof truss system of steel and supported on a suitable foundation structure.

9.5.11.18 Guard House

The guard house will be a single-story design and constructed of block work.

9.5.11.19 Water Supply

The Plant's water requirements are discussed in Sections 9.5.5.1 and 9.5.5.2 above.

Table 19 below shows the water supply required by the plant for the water cooled case. If the air-cooled option is selected, the cooling tower makeup will not be required.

Table 19: Water supply to the Plant (Water-cooled case)

WATER SERVICE	SOURCE	L/d
Potable water	RBIDZ potable water system	6,000
Demin feed and service water	RBIDZ potable water system and/or bulk clarified water system	409,000
Cooling tower makeup	Bulk clarified water	21,000,000

9.5.11.20 Sanitary Sewage, Water Drainage and Treatment

The Plant's domestic sewage will be discharged into the sewage system of the RBIDZ, which feeds into the municipal sewer network.

All liquid effluent waste produced by the Plant from different sections shall be collected in an Effluent Treatment Plant and treated as required to meet the relevant standards. The capacity envisaged for this facility is approximately 20 m^3/hr.

All oil waste effluents shall be collected into a separate network and sent to an oil separator. The treated water shall be routed to the Wastewater Monitoring Sump where it is continuously monitored for pH, Total Dissolved Solids (TDS) and other parameters, as required.

Wastewater from the demin plant and HRSG blowdown, will be routed to the Neutralisation and Filtration Sump. The treated wastewater will then be routed to the Wastewater Monitoring Sump.

9.5.11.21 Drainage

The drainage system will be designed to cope with surface water, maintenance and normal plant flows, oil contaminant and oil drainage and will handle all drainage requirements including firefighting.

Flooring of all enclosed buildings and cable / fuel and other trenches will be designed and graded to ensure there is no accumulation of water at any time.

The oily water drainage system will be provided for all floor drains and plant areas and areas subject to oil spillage and or leakage. Oily water effluent shall be passed though oil separators and monitored before discharge to the storm water drainage system via the wastewater monitoring basin. CoU's requirements will be adhered to.

The storm water drainage systems may use open ditch, underground piping or both. All open drains in areas of operation and maintenance will be covered for safety purposes. Building perimeter drains will be covered at all entry and exit points. A storm water manhole or catch basin will be provided at points of direction change and spacing of manholes will be subject to municipal requirements.

9.5.11.22 Roadworks

Roads for common and frequent use within the Plant will be designed with sufficient width and strength to be durable for the design life of 25-years.

Hard standing areas will be provided around the plant, where mobile cranes or equipment will be used to maintain major equipment.

Surfaces will be suited to the type of vehicles likely to use them.

The roads and hard standings will have sufficient turning radius for all vehicles envisaged will operate within the Plant.

9.5.11.23 Fencing and Gates

The plant perimeter will be protected by fencing and gates in appropriate places. As a minimum the number of gates will be sufficient for efficient control of site traffic. The perimeter fencing will be

adequate for the degree of security needed for such an installation, either constructed from reinforced concrete block-work or chain-link anti-intruder fencing.

9.5.11.24 Landscaping Works

The Plant will be landscaped where possible, including green areas, plants and trees and will be maintained as part of the operation and maintenance phase.

9.5.11.25 Paved Areas

Concrete paving will be used for areas subject to high risks of oil spillage / leakage, designed to support the heaviest wheel loading from vehicles expected to operate in the Plant.

Any gravel paving will be constructed of crushed rocks of an agreed grading and quality and densely compacted. If the gravel pathing is applied as the driveway, the surface will be blinded by rock chippings to form a reasonably smooth surface.

Areas not paved will be levelled and finished with an agreed grading of pebbles or stones.

9.5.11.26 Staff and Visitor Open and Covered Car Parks

A covered car park to accommodate ten (10) cars will be located at a location close to the main office building. An open car park will be provided to accommodate fifteen (15) cars. All car parks will be of gravel pathing.

9.5.11.27 Pipe and Cable Trenches

All cable and pipe trenches will be constructed from reinforced concrete, with pre-cast concrete cover slabs complete with galvanized lifting keys. Trench bottoms shall be laid to falls and subject to drainage provisions by means of submersible pumps at regular intervals along their lengths.

At road crossings heavy duty reinforced trench covers will be installed, designed to withstand wheel loads from the heaviest vehicle expected to operate within the Plant.

9.5.11.28 Pipe and Cable Racks

Pipe and cable racks will be constructed as a structural steel framework supported by reinforced concrete foundations.

9.5.11.29 Signage

Signage will be provided where applicable for all buildings, plants and rooms in Zulu and English.

9.5.12 Operations and Maintenance

9.5.12.1 Operational Manpower

During the operational phase, around 50 local personnel will be employed and given hands-on training in Power Plant Operation and Maintenance.

Manpower for the plant will be a mix of expatriate and local personnel with training and knowledge transfer for local personnel throughout the duration of the operations. The organogram contemplated is shown in Figure 18 below.

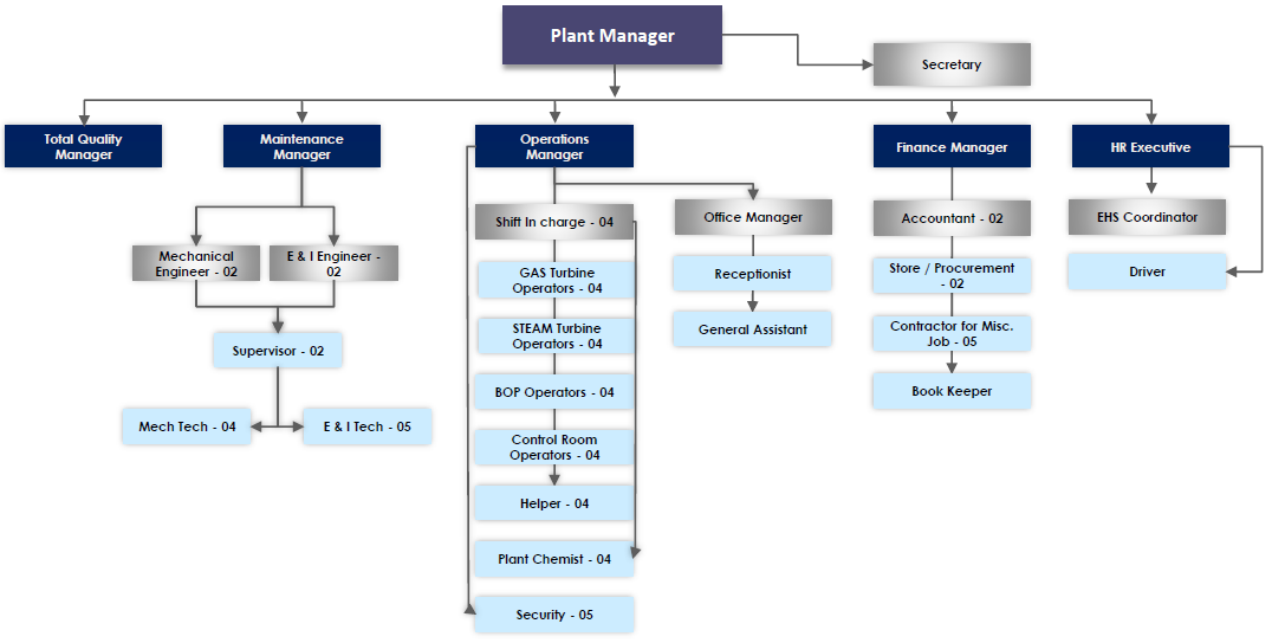


Figure 18: Organogram of operational manpower

9.5.12.2 Planned Maintenance

Planned maintenance will include scheduled maintenance on the Plant based on the OEM recommendations. This is based on exact knowledge of the Plant's build and service status to allow a precise and detailed schedule to be initiated. Spare and Consumable Parts will be held in stock or delivered to site in sufficient time to allow routine maintenance to be undertaken. Specialist engineers will be mobilised for major shutdowns as required from specialist maintenance providers.

9.5.12.3 Unplanned Maintenance

Unscheduled maintenance will be managed by the Plant personnel, by identifying the root cause of the issue, and mobilising required parts, tooling and labour. A reasonable number of spares will be held on site to minimise downtime should an unplanned maintenance event occur.

9.5.12.4 Tooling

General tooling, test and calibration equipment for day-to-day maintenance will be available on site along with the specialist tooling provided by the Combustion and Steam Turbine suppliers for any scheduled and unscheduled maintenance. Specialised test equipment or tooling for items such as generator inspections; boiler tubes, etc. shall be brought to site on an as required basis along with heavy lifting equipment such as scissor lifts, cranes, etc.

9.5.12.5 Health, Safety & Environment

The Plant will follow a rigorous Health, Safety and Environment programme dedicated to providing a safe and secure environment for the community and plant personnel. All applicable legislation, regulations and standards shall be applied.

9.5.12.6 Security

Appropriate plant security will be provided and all procedures for the safety, emergency evacuation and general protection of the personnel and visitors will be in place.

9.5.13 Project Development Plan

The Project can be developed into multiple phases as required. Below is an overview of a proposed 2 phase plan, which will be revised to suit Project specific requirements.

9.5.13.1 Phase I: Permits, Authorisations & Agreements

Phase I would comprise the processes to seek environmental approvals as well as to finalise the agreements necessary for the Project (e.g., Fuel Supply Agreements, Grid Access Agreements, Water Supply Agreements etc.). This would be required for Financial Close.

Since delivery of the gas turbines is likely to be on the project's critical path, a Slot Reservation will likely be made with an OEM during this phase.

Significant Feasibility level planning, engineering and design will be carried out in order to determine the optimal approach for construction and operation.

It is anticipated that Phase I will take 12-18 months to complete.

9.5.13.2 Phase II: Construction and Commissioning

Once all approvals are in place, and funding is finalised, Phase II would entail the finalisation of the detailed design after which procurement and construction will proceed.

Phased plant commissioning and testing will follow and this will take 3 – 6 months, overlapping with the final construction items.

It is anticipated that Phase II will take 24 - 36 months to complete.

9.5.14 Decommissioning

The Plant has been designed for an operation period of 25-30 years, although all major components can be replaced / maintained to allow for last indefinite operation.

It is envisaged that the scheme will be used indefinitely, under suitable maintenance. Decommissioning is thus not considered applicable at this stage. However, should decommissioning be required the activity will need to comply with the appropriate and prevailing environmental legislation and best practices at that time.

9.5.15 Period for which the Environmental Authorisation is Required

It is requested that the Environmental Authorisation (if granted) remains valid for a period of 10 years.

9.6 Hazardous Materials

A number of fuels, gases and chemicals will be utilised and stored on site and these are described and quantified in this section.

9.6.1.1 Natural Gas

The facility will be supplied via the ZET, which will include significant storage capacity needed to supply a number of facilities in the Richards Bay precinct. Interruptions in the supply of natural gas are expected to be very infrequent given the national importance of the new power plant capacity being installed in Richards Bay. Furthermore, the ZET facility will be connected to the Lilly Pipeline which will connect Richards Bay to Gauteng and the Rompco Pipeline. As such the buffering capacity of the natural gas pipeline network will further significantly mitigate against fuel supply interruptions.

Given the anticipated high reliability of the natural gas supply, no natural gas storage facilities are proposed on site. Consequently, the only natural gas present at the facility will be that contained within the gas pipelines and associated equipment. This is summarised in Table 20.

Table 20: Summary of Natural Gas volumes on site

Item	No	ID mm	Length m	Unit volume m^3	Volume m^3
Storage					0
Main NG header, 406mm Sched 40	1	381	200		91
Pipe to each turbine, 254mm Sched 40	1	254	200		41
Miscellaneous piping equivalent	1	381	100		46

Item	No	ID mm	Length m	Unit volume m^3	Volume m^3
Filter vessels	4			1	4
Water Bath Heater	2			2	4
Miscellaneous equipment	1				5
TOTAL					190
Safety factor for EIA purposes	20%				**229**

The supply pressure in the Lilly pipeline is approximately 50 bar and this would be the maximum pressure possible in all of the equipment exposed to natural gas. At this pressure, the 229 m^3 of natural gas present on site is estimated at 8 900kg contained in the pipe network. At standard operating conditions, the mass of natural gas present on site would be closer to 5 500kg.

9.6.1.2 Nitrogen

Nitrogen is required during commissioning and maintenance operations, to purge fuel pipes and equipment of oxygen before maintenance can be carried out or before fuel is re-introduced. Nitrogen is also required for inert blanketing of the HRSG and various steam pipelines to preclude the presence of oxygen and thereby prevent corrosion.

Nitrogen supply will be from cylinder banks delivered to the facility by vehicle and all required unloading and storage facilities for such cylinders will be included in the project. A forklift will be used to move cylinder banks on site.

Nitrogen will be passed through a filter, typically 1 µm, before entering the nitrogen supply network which will be suitably protected from overpressure.

Typically, there will be three cylinder banks of sixteen 50 L cylinders at 200 bar on site. Each cylinder contains around 10 Nm^3 of nitrogen and so approximately 500 Nm^3 of nitrogen will be on site. Prior to a shutdown or maintenance work, the normal use stock may be increased to approximately 1 000 Nm^3, or 1 250 kg.

9.6.1.3 Hydrogen

As with all large generators, hydrogen will be used as the cooling fluid. The hydrogen is in a closed system requiring the occasional top up to replenish any leakages. As such this make up will be provided by hydrogen cylinder banks.

A total of 3 hydrogen bottle banks of sixteen 50L cylinders at 200 bar will be on site. This would be a total of 480 Nm^3 or 45 kg.

9.6.1.4 Carbon Dioxide

A total flooding carbon dioxide (CO_2) system to NFPA 12 will protect the gas turbine and generator enclosures. The CO_2 is held in low-pressure storage and around 10 tons will be stored on an outdoor skid adjacent to the turbine block.

9.6.1.5 Diesel

During normal operations, there is no consumption of diesel fuel, however during periods when ZET gas supply is interrupted, or during emergency grid interruptions, diesel fuelled equipment will come into operation to ensure either continued operation of the plant, or to allow for safe and controlled shutdown/start up of the plant.

Diesel will be required for the following equipment items:

- Emergency Diesel Generators
- Diesel Firewater Pumps
- Black Start Generator (if installed, but this is unlikely)
- The gas turbines in the unlikely event that commercial terms require diesel as a backup fuel

The required storage volume for each item is shown in Table 21. The Volume on Site column includes a margin of 20% and represents the maximum volume that would be stored on site.

Table 21: Summary of diesel stored on site

Equipment Item	Consumption	Required operating time	Volume required (m^3)	Volume on Site (m^3)
Emergency Diesel Generators, 2x 1 MW	250 L/hr	36 hours	9	15
Diesel Firewater Pumps, 2x 300kW	100 L/hr each	12 hours	2.4	5
Total required				**20**
Black Start Generator, 20 MW	5 000 L/hr	3 hours	15	25
Total possible				**45**
Diesel backup for turbine fuel	72 700 L/hr each turbine	3 days	10 500	12 000
Maximum case (unlikely)				**12 045**

Note: Volume on Site includes an uncertainty factor and represents the maximum likely volume on site.

The most likely case is that a total of 20 m^3 of diesel will be present on the site if all storage vessels are full. In the less likely case that a Black Start Generator is required then the volume of diesel on site will increase to 45 m^3.

Each day tank holding diesel would be suitably bunded to contain any potential leaks or spillages and the bunds will drain to the oily water system.

A possible, but unlikely case is that the project will be required to implement a backup fuel for NG. In this case, diesel will be used, and for 3 days of operation, 12 000 m^3 will be stored on site, in two adjacent tanks.

Such tanks shall be provided with secondary containment (bunding) in accordance with SANS 10131 (Above-ground storage tanks for petroleum products) and SANS10089-1 (Storage and distribution of petroleum products in above-ground bulk installations). Standard practice requires the bund to contain a minimum of 110% of the capacity of the largest single tank within that bund, providing margin above nominal tank volume to account for rainfall accumulation and displacement effects during a tank failure or overfill event.

The bund floor and walls will be constructed of impermeable material (typically reinforced concrete with a chemically resistant liner or coating suited to hydrocarbon exposure) to prevent groundwater contamination in the event of a containment event, and the bund will be provided with a controlled drainage system - typically a manually operated valve, kept closed under normal conditions - to allow supervised removal of accumulated rainwater via the oil-water separator, preventing uncontrolled discharge of potentially contaminated water to the stormwater system.

Furthermore, all required and appropriate safety systems will be included in the design of the tanks and related systems, including:

- High/high-high level alarms with automatic overfill shutoff;
- Tank venting (normal and emergency pressure/vacuum relief);
- Adequate fire separation distances per SANS 10089;
- Fixed/semi-fixed foam fire suppression system;
- Tank shell cooling (deluge/spray) system for adjacent fire exposure;
- Portable fire extinguishers at strategic locations;
- Static bonding/earthing at tank, piping, and tanker connection points;
- On-site spill containment kits;
- Restricted access control and signage;
- Lightning protection; and
- Scheduled tank integrity inspection/testing (API 653 or equivalent).

The notes on diesel tanks above also apply to smaller day-tanks, apart from the requirement for fixed fire suppression measures.

9.6.1.6 Lubrication Oil

Each of the three turbines will hold around 200 L of lubrication oil and will consume around 20 L/d. A number of pumps and other small rotating equipment items will also require small volumes of lubrication oil.

Allowing for a storage volume of one oil change for each turbine, and 3 months of top-up, plus consumption by smaller equipment, a maximum of 8 m^3 will be stored on site, in 200 L drums, or in a dedicated storage tank.

All turbines and other potential spill points will have containment measures and any accidental spillages with be directed to the oily water separator.

9.6.1.7 Hydraulic Oil

The steam turbine will require hydraulic oil and up to two 200L drums will be stored on site. The turbines and drum storage area will have containment measures and spills will be directed to the oily water separator.

9.6.1.8 Transformer Oil

There will be three oil-filled transformers on site. The volumes of transformer oil in these units are listed below:

- 3x GSU: 400 MVA 15 kV to 400 kV, approximately 50 m³ (50 000 liters) per transformer;
- 2x UAT: 30MVA15kV down to 11 kV or 6.6 kV or 3.4 kV, approximately 12 m³ (12 000 liters) per transformer; and
- 2x NECR: approximately 2 m³ (2 000 liters) per unit.

There will therefore be approximately 200 m^3 of transformer oil contained within the transformers on site.

Apart from the oil inside the transformers, approximately 400 L of transformer oil will be stored on site, in 200 L drums.

9.6.1.9 Glycol

Glycol (ethylene glycol or propylene glycol) may be used in the closed cooling water system. Typically, a 30% glycol/water mix is used. This would occasionally need to be topped-up, and for this purpose up to 10 m^3 could be stored on site, in 200 L drums or 1 000 L IBC containers.

9.6.1.10 Water Treatment Chemicals and Effluent Discharge Chemicals

The Demineralisation Plant resin beds will require regular regeneration with both hydrochloric acid (30% solution) and caustic soda (40% solution) solutions. These solutions will also be used to correct the pH of water in the neutralising sump before discharge.

Approximately 35 m^3 of hydrochloric acid solution will be stored on site, and about the same volume of caustic solution, both in dedicated tanks.

9.6.1.11 Boiler/HRSG Dosing Chemicals

Ammonia

Ammonia is used to increase the pH of the water in the steam systems to prevent corrosion. Typically a 20 – 30% solution is used. This will be stored in either flowbins or a dedicated tank. 15 m^3 of ammonia solution will be on site.

Phosphate

Sodium phosphate solution (5 – 10% strength) might be required to buffer the pH of the water in the HRSG drum and to prevent scaling.

Sodium phosphate could be delivered to the plant as a dry powder, in 25 kg bags, and mixing could be done on site. Alternatively, it could be delivered as a solution in 1 000L flowbins or by bulk tanker.

If phosphate is used, approximately 15 m^3 will be stored on site, in a dedicated tank.

9.6.1.12 Sodium chloride

If the water-cooled option is selected, the cooling tower circuit may require an electro-chlorination plant to control algae. The plant uses sodium chloride (salt) to produce chlorine. If this option is selected, a maximum of about 5 t of sodium chloride will be stored on site, in 1 t bulk bags.

9.6.1.13 Sodium hypochlorite

An option to the above-mentioned electro-chlorination plant is dosing with sodium hypochlorite. If this option is selected, then approximately 15 m^3 of a 12.5% solution will be stored on site, in flowbins, or in a dedicated HDPE or rubber-lined tank.

9.6.1.14 Other Hazardous Substances on Site

Small volumes of other anti-corrosion, anti-scaling and algae/bacteria control chemicals might also be used and stored on site, as well as diverse chemicals for laboratory use. The volumes of these chemicals on site would be small and will only be finalised during detailed engineering.

9.6.1.15 Hazardous Material Summary

The volumes of hazardous materials present on the site during normal operations are shown in Table 22.

Table 22: Summary of hazardous materials present on site

Material	Use	Consumption	Volume on site
Natural Gas	Turbine fuel	120 000 Nm^3/hr 120 tph	229 Nm^3 or 8 900 kg
Nitrogen	Purging, blanketing	Intermittent	500 Nm^3 or 625 kg
Hydrogen	Turbine cooling	50 Nm^3/d	480 Nm^3 or 45 kg
Carbon dioxide	Fire supression	Very seldom	10 tons

Material	Use	Consumption	Volume on site
Distillate fuel (diesel) (possible)	Backup to NG	Very seldom 140 m^3/hr	0 or 12 500 m^3
Distillate fuel (diesel)	Emergency generator fuel	Very seldom 100 – 5,000 L/h	45 m^3
Lubrication oil	Turbine lubrication	80 L/d	8 m^3
Hydraulic oil	Hydraulic systems	Intermittent	400 L
Transformer oil	Transformers	Intermittent	200 m^3
Glycol	Water cooling circuits	Intermittent	
Caustic soda, 40% solution	Water treatment	30 L/d	35 m^3
Hydrochloric acid, 30% solution	Water treatment	40 L/d	35 m^3
Ammonia, 20 – 30% solution	Boiler water chemistry management	275 L/d	15 m^3
Phosphate, 5 – 10% solution	Boiler water chemistry management	80 L/d	15 m^3
Sodium chloride (possible)	Electro-chlorination plant feed	180 kg/d	5 000 kg
Sodium hypochlorite solution approx. 12.5% (possible)	Cooling water dosing	420 L/d	15 m^3

9.6.1.16 Storage of Hazardous Materials

In all cases, hazardous materials will be safely and correctly stored according to all relevant regulations and standards.

Backup Diesel Fuel Tanks and Diesel Day Tanks

In the unlikely event that backup diesel fuel is required for the turbines, this will be stored in two tanks of approximately 6 500 m^3 each. There will also be smaller diesel day tanks at the emergency generators and the diesel firewater pumps.

Such tanks shall be provided with secondary containment (bunding) in accordance with SANS 10131 (Above-ground storage tanks for petroleum products) and SANS10089-1 (Storage and distribution of petroleum products in above-ground bulk installations). Standard practice requires the bund to contain a minimum of 110% of the capacity of the largest single tank within that bund, providing margin above nominal tank volume to account for rainfall accumulation and displacement effects during a tank failure or overfill event.

The bund floor and walls will be constructed of impermeable material (typically reinforced concrete with a chemically resistant liner or coating suited to hydrocarbon exposure) to prevent groundwater contamination in the event of a containment event, and the bund will be provided with a controlled drainage system — typically a manually operated valve, kept closed under normal conditions — to allow supervised removal of accumulated rainwater via the oil-water separator, preventing uncontrolled discharge of potentially contaminated water to the stormwater system.

Furthermore all required and appropriate safety systems will be included in the design of the tanks and related systems, including:

- ❑ High/high-high level alarms with automatic overfill shutoff;

- Tank venting (normal and emergency pressure/vacuum relief);
- Adequate fire separation distances per SANS 10089;
- Fixed/semi-fixed foam fire suppression system;
- Tank shell cooling (deluge/spray) system for adjacent fire exposure;
- Portable fire extinguishers at strategic locations;
- Static bonding/earthing at tank, piping, and tanker connection points;
- On-site spill containment kits;
- Restricted access control and signage;
- Lightning protection; and
- Scheduled tank integrity inspection/testing (API 653 or equivalent).

Liquid Chemical tanks

There will be a number of liquid chemicals stored on site, including solutions of sodium hypochlorite, hydrochloric acid, phosphate, caustic soda and aqueous ammonia. Where such chemicals are stored in tanks, such will be designed and constructed in accordance with all relevant norms and standards and constructed out of material suitable for that chemical.

Aqueous ammonia releases ammonia vapour, so its storage and dosing area will be ventilated, vented through a scrubber where required, fitted with ammonia gas detection, and served by the emergency eyewash, shower and Personal Protective Equipment (PPE) facilities noted below.

Secondary containment (bunding) sized on 110% of largest single tank in the enclosure will be provided. The bunds will be of materials compatible with the specific chemical contained — typically HDPE or FRP (fibreglass-reinforced plastic) linings for hypochlorite and caustic, and acid-resistant coatings (e.g., epoxy or vinyl ester lining systems) for hydrochloric acid.

Each chemical category (acid/base) will have its own separate bunding since accidental mixing in the event of a simultaneous leak or bund overflow can generate hazardous reactions.

Bund drainage, will be via a normally-closed valved connection, and will be routed to the neutralisation sump.

Furthermore, the following will be applied where appropriate:

- High/high-high level alarms with overfill protection;
- Chemical-compatible tank materials and fittings (HDPE, FRP, lined steel);
- Ventilation for off-gassing;
- Emergency eyewash/shower stations at each tank and dosing point;
- Chemical-resistant PPE stored nearby;
- Chemical-specific signage (SANS/GHS hazard labelling);
- Segregated spill kits per chemical;
- Segregated, bunded tanker offloading points to prevent cross-contamination; and
- Scheduled inspection and bund liner integrity testing.

Oils (Lubricating, Hydraulic and Transformer Oil)

Lubricating oil, hydraulic oil and spare transformer oil will be stored with secondary containment. Bulk and drummed oils, including the turbine lubricating oil change volumes, the steam turbine hydraulic oil drums and the spare transformer oil drums, will be kept in a dedicated bunded oil store with an impermeable floor and a bund capacity of at least 110% of the largest container. Each oil-filled transformer will be provided with a containment pit or bund sized to retain the full oil volume of the transformer plus firewater, drained through an oil-water separator. All oil bund and pit drainage, and any oil spillages at the turbine and equipment oil systems, will be routed to the oily water separator system.

Compressed and Liquefied Gas Storage (Hydrogen, Nitrogen and Carbon Dioxide)

Hydrogen for generator cooling, nitrogen for purging and inert blanketing, and carbon dioxide for the gas turbine fire suppression system will be stored on site as compressed or liquefied gas in cylinder banks or bulk vessels. Because hydrogen is flammable and easily ignited, the hydrogen cylinder banks will be located outdoors in a dedicated, well-ventilated and shaded compound, separated from ignition sources, occupied buildings and other hazardous stores by the distances required by the applicable codes, fitted with hydrogen gas detection and hazardous-area rated electrical equipment, and provided with lightning protection and hazard signage. Nitrogen and carbon dioxide are asphyxiants, so their storage areas will be well ventilated, signed for the asphyxiation hazard and, where enclosed, monitored for oxygen depletion. All cylinders and banks will be secured, restrained, protected from vehicle impact and positioned for safe delivery and change-out.

Dry and Bagged Chemicals

Dry and bagged chemicals, such as sodium phosphate in 25 kg bags and sodium chloride for the electro-chlorination plant, will be kept in a weatherproof store on an impermeable floor, segregated by compatibility and kept clear of incompatible liquids.

Major Hazard Installation

Given the quantities of flammable, toxic and hazardous substances that may be stored on site, in particular natural gas, diesel fuel, hydrogen and the bulk chemicals, the facility will be assessed against the Major Hazard Installation (MHI) Regulations under the Occupational Health and Safety Act (Act No. 85 of 1993). Where the classification thresholds are exceeded, a MHI risk assessment will be carried out, and the required risk-management and emergency-response measures put in place.

9.7 Plant Emissions

The new power plant will endeavour to install a modern low emission power plant fully compliant with World Bank emission standards. The gas turbines will be modern highly efficient units using DLN (dry low NOx burners). The LNG/ natural gas fuel used will be essentially sulphur free, thereby eliminating any SOx in the air emissions.

The power plant will be a combined cycle gas turbine power plant where the waste heat generated by the combustion of the natural gas in the gas turbines will be directed through a high efficiency triple pressure reheat HRSG to generate steam which will used in a steam turbine generator to generate further electrical power.

The gas turbines will be selected such that they comply with, or exceed the following air emissions specifications:

- NO_x ≤ 25 ppmvd @ 15% O_2 dry equivalent;
- CO ≤ 25 ppmvd @ 15% O_2 dry equivalent; and
- UHC ≤ 5 ppmvd @ 15% O_2 dry equivalent (unburned hydrocarbons).

Actual air emissions are determined by the fuel composition, the gas turbine combustion and the overall power plant efficiency. In combined cycle power plants, the cooling technology plays an important role in determining the power plant efficiency. For the Mabasa Richards Bay Power Plant this aspect has yet to be finalised and will be based on the availability of a suitable source of water for a wet mechanical cooling tower. Based on preliminary power plant designs, Table 23 illustrates the differences in emissions based on cooling technology used.

Table 23: Estimated CCGT Emissions (water vs dry cooling comparison)

Parameter	Water Cooling	ACC Dry Cooling	Unit / basis
Power Plant Net Efficiency	56.5%	55.8%	
Exhaust gas NOx (as NO_2) content	25	25	ppmv, @ 15% O_2, dry
Exhaust gas CO content	25	25	ppmv, @ 15% O_2, dry
Exhaust gas UHC content	5	5	ppmv, @ 15% O_2, dry
Emissions: CO_2 per MWh	340	345	kg/MWh
Emissions: NOx as NO_2 per MWh	0.27	0.275	kg/MWh
Emissions: CO per MWh	0.17	0.17	kg/MWh
Emissions: SOx as SO_2 per MWh	0	0	kg/MWh
Emissions: UHC as CH_4 per MWh	0.0187	0.0189	kg/MWh

From the above table it is apparent that the emissions per MWh are somewhat improved for the wet cooling case. The problem is the water required and the management of the associated blowdown of the cooling tower when the salt content becomes too high. Possible water sources being considered are the bulk clarified water provided by RBIDZ, boreholes, or possibly sea water. Due to the volumes required the use of potable water from UUW would be excessive and is not considered.

Each gas turbine and HRSG line will have 2 stacks. The bypass stack is used when running in simple cycle and the main boiler stack when running in combined cycle. The normal mode of operation is combined cycle with efficiencies greater than 55% and emissions as illustrated above. Table 24 shows the current estimated stack dimensions.

Table 24: Proposed stack dimensions

Stack parameters	Bypass Stack	Main Stack
Stack height (m) at top of stack	40±5	65±5
Stack diameter (m) approx.	6.9	6.991
Emission Exit Velocity (m/s)	41	17.7
Emission Exit Temperature (°C)	620	102

Since the clean fuel is used where in the SO_2 emissions are zero the Plant needs to maintain a minimum 30 m of stack height with a diameter of approximately 6.9 m for bypass stack and 60 m with a diameter of approximately 6.3m for HRSG stack. The exact heights of stack shall be finalised during the design phase in line with the international standard guidelines based on fuel data.

The HRSG will utilise about 90% of the heat content in the exhaust gases in producing steam for use in the steam turbine. Heat emission from the stack into atmosphere will not cause any significant increase in ambient temperature as exit temperatures are approximately 100°C.

Each stack will be connected to a Continuous Emissions Monitoring Station (CEMS) unit for continuous emissions monitoring.

9.8 Resources and Services required for Construction and Operation

This section briefly outlines the resources and services that will be required to execute the Project. Note that provision will be made in the EIA Report and the EMPr to manage impacts associated with aspects listed below, as relevant.

Refer to the letter from the RBIDZ regarding the availability of services for the proposed Plant, which is contained in **Appendix D**.

9.8.1 Water

Construction

During the construction stage, water will be required for various purposes, such as concrete batching, washing of plant and equipment in dedicated areas, dust suppression, potable use by construction workers, etc.

Water for construction purposes will be directly sourced from the water available at the boundary of the site within the RBIDZ Phase 1F (municipal supply). Water tankers will also supply water to the site, if necessary.

All water uses triggered in terms of Section 21 of the NWA will comply with DWS' requirements.

Operation

Water required for the operational phase is discussed in Section 9.5.5 above.

9.8.2 Sanitation

Construction

Sanitation services will be required for construction workers in the form of chemical toilets, which will be serviced at regular intervals by the supplier.

Operation

The Plant's domestic sewage will be discharged into the sewage system of the RBIDZ, which feeds into the municipal sewer network. Refer to Section 9.5.5.8 above.

9.8.3 Waste

Construction

Construction waste will include waste generated from site preparations (e.g. plant material), domestic waste, surplus and used building material, and hazardous waste (e.g. chemicals, oils, soil contaminated by spillages, diesel rags). Solid waste generated during the construction phase will be temporarily stored at suitable locations (e.g. at the construction camp) and will be removed at regular intervals and disposed of at approved waste disposal sites. All the waste disposed of will be recorded.

Some notes in the Integrated Waste Management Plan (IWMP) (CoU, 2022c) in terms of waste management in the municipality include the following:

- The regional landfill, which is used for general waste disposal, is owned by the KCDM. The permit was granted in 2003 under the name uThungulu District Municipality (Permit Number 16/2/7/W1/D1/Z1/P485) and it was amended in 2012 to incorporate recycling on site under a new Waste Management Licence number (DC 28/WML/0002/2012);
- There are two waste transfer stations in the municipality, which are located in Alton and Ntambanana; and
- There are two Material Recovery Facilities (MRFs) in the municipality, which include Mzingazi MRF and eNseleni MRF.

Construction-related wastewater, which refers to any water adversely affected in quality through construction activities and human influence, will include the following:

- Sewage;
- Water used for washing purposes (e.g., equipment, staff); and
- Drainage over contaminated areas (e.g., cement batching / mixing areas, workshop, equipment storage areas).

Specific measures for the management of construction-related waste and wastewater will be provided in the EMPr.

Operation

Minimum solid waste will be generated during the operational phase of the proposed Plant. Domestic waste from operational staff and waste generated during maintenance works will be form part of the municipal waste stream.

Refer to Sections 9.5.5 and 9.5.11.20 above for a discussion on the liquid waste to be produced during the operational phase of the Plant.

9.8.4 Roads

Construction

Temporary access roads will be created during the construction phase.

Operation

The controlled access point to Phase 1F of the RBIDZ (see Figure 19 below) is off Alumina Alley Road. An access road runs along the western boundary of the site, which was developed as part of the industrial estate by the RBIDZ (see Figure 20 below).



Figure 19: Controlled access point to Phase 1F of the RBIDZ



Figure 20: Existing access road (the site is located on the left-hand side of the photograph)

9.8.5 Stormwater

Construction

Best environmental practices will be implemented during construction to manage stormwater, which will be included in the EMPr.

Operation

Refer to Sections 9.5.5.7 and 9.5.11.21 above.

Best environmental practices will be implemented during the operational phases to manage stormwater, which will be included in the EMPr.

9.8.6 Electricity

Construction

Electricity is already available at the site, as installed by the RBIDZ (municipal supply). Power for construction purposes will be obtained from diesel generators or from these existing services.

Operation

Power for the operational phase will be obtained from the power generated by the operations and the existing electricity services available at the site.

9.8.7 Construction Camp

The construction camp will be established on the site.

It is anticipated that provision will be made for the following facilities at the construction camp (amongst others):

- Security access;
- Concrete batching plant;
- Site offices;
- Parking area;
- Workshop and stores;
- Utilities and services;
- Safety and emergency facilities (firefighting equipment and emergency assembly points);
- Areas for handling hazardous substances;
- Wash bays for construction plant;
- Ablution facilities;
- Eating area; and
- A solid waste storage facility.

10 ANALYSIS OF ALTERNATIVES

10.1 Introduction

Alternatives are the different ways in which the Project can be executed to ultimately achieve its objectives. Examples could include carrying out a different type of action, choosing an alternative location or adopting a different technology or design for a project.

The sub-sections to follow discuss the alternatives considered for the Project. The alternatives were provided by the Project's technical team.

10.2 Project Alternatives

10.2.1 Energy Generation

South Africa's electricity sector has, for a long period of time, operated under significant supply constraints, most visibly through the extended periods of rolling blackouts ("load shedding") experienced between 2007 and 2023, which has been identified as a structural constraint on national economic growth. Following improved generation performance and an extended period without load shedding since 2023, government's stated policy objective, as articulated through the IRP 2025 approved by Cabinet in October 2025, is to shift from a supply-constrained posture to one that actively supports and enables economic growth — targeting a 3% Gross Domestic Product (GDP) growth rate by 2030, alongside a new-generation capacity build programme of some 105,000 MW by 2039, more than double Eskom's current installed capacity. This reflects a policy view that reliable, adequate electricity supply is a precondition for industrialisation, investment attraction, and job creation, rather than merely a response to existing demand.

The IRP 2025 assumes electricity demand will grow at approximately 2.3% per year over the coming decade, a rate exceeding its own underlying GDP growth assumption of 1.5-2% per year. It is relevant to note, for a balanced treatment of this topic, that this demand growth assumption has drawn informed criticism: since 2011, sales of grid electricity in South Africa have in fact declined by approximately 15%, a trend some independent economists argue is inconsistent with the IRP's projected demand trajectory, and which raises a risk of overinvestment in new generation capacity if realised demand growth undershoots the plan's assumptions. Government's counter-position is that suppressed demand over the past decade has been substantially a function of supply constraints and administratively restricted sales to energy-intensive users (particularly mining and metals refining), rather than a genuine ceiling on underlying demand, and that improved supply reliability and pricing conditions will unlock this latent demand going forward. Separately, and consistent with the broader African context, the International Energy Agency has reported that electricity demand growth across the African continent accelerated to 5.2% in 2025, with South

Africa — accounting for roughly a quarter of the region's electricity consumption — a leading contributor to that growth on the back of improved domestic supply reliability.

Irrespective of the specific demand growth trajectory ultimately realised, the national planning consensus reflected in the IRP 2025 is that substantial new generation capacity, including new gas-fired capacity of the type proposed by this Project, is required over the coming decade both to replace ageing and retiring coal generation capacity and to provide adequate reserve margin and dispatchable capacity to support the broader shift toward variable renewable generation. The Project is positioned to contribute to this capacity requirement, consistent with national energy planning objectives.

South Africa's IRP has, through successive iterations, consistently identified new gas-fired generation capacity as a strategic requirement to ensure energy security and to support the country's broader transition away from a coal-dominated generation mix. Following the promulgation of the IRP in 2019, the Minister of Mineral Resources and Energy determined, in accordance with section 34 of the Electricity Regulation Act, 2006 (Act No. 4 of 2006), that the procurement of new generation capacity was required to ensure energy security, and that approximately 3 000 MW of this capacity would be generated from gas. The GASIPPPP was identified by the then DMRE as the appropriate programme to procure this new generation capacity, with its first Bid Window designed to procure 2 000 MW (comprising Capacity, Ancillary Services, and Energy Output) from land-based gas-fired power generation facilities located anywhere within the borders of South Africa. The remaining 1 000 MW of this determination has been reserved for a separate procurement process, for facilities to be located in the area known as Zone 13, within the Coega Special Economic Zone near the Port of Ngqura, and does not form part of the site-agnostic Bid Window 1 process relevant to this Project.

This gas-to-power determination has subsequently been reaffirmed and expanded under the IRP 2025, approved by Cabinet in October 2025, which allocates a total of 6 000 MW of new gas-to-power generation capacity to be brought online by 2030, split between Eskom (3 000 MW) and independent power producers (3 000 MW). Whether the Project is ultimately procured under the original GASIPPPP determination (flowing from the IRP 2019), a subsequent bid window or determination flowing from the IRP 2025 allocation, or another suitable gas-to-power procurement mechanism, is a commercial and regulatory matter to be finalised by the Applicant in due course, and does not alter the fundamental basis on which the Project's generation technology and fuel type have been determined: successive government energy planning processes have consistently identified new gas-fired generation as a required component of the national generation mix.

It is noted that Richards Bay is also the intended location for the Pictor 990MW GASIPPP proposal and the 3 000MW gas-fired power project being developed by Eskom, outside of the IPP procurement process. This is a relevant contextual factor for the Project's site selection and competitive positioning within the broader gas-to-power programme, though it does not alter the basis on which the Project's generation technology has been determined.

The TNPA has undertaken a separate procurement process to conclude a 25-year concession agreement for the design, construction, operation, and maintenance of a natural gas terminal in the CoU. Accordingly, any Bidders wishing to submit facilities located within the borders of the CoU for participation in a gas-to-power IPP procurement programme are required to secure their fuel supply through the TNPA's natural gas terminal. This directly informs the Project's proposed fuel supply arrangement via the ZET, as described elsewhere in this Project Description.

The Applicant intends to bid for the GASIPPPP (and/or other suitable energy markets), which has been identified by government as an appropriate programme to procure new gas-fired generation capacity determined in terms of South Africa's IRP, in order to ensure energy security. Hence, alternatives to energy generation technology are not relevant to this Project; the Project's technology and fuel type are a function of the procurement programme for which the Applicant intends to bid, rather than a discretionary choice open to comparative assessment in this EIA.

10.2.2 Location

The Project site is located within Phase 1F of the RBIDZ, a purpose-built and secured industrial estate forming part of a designated Special Economic Zone, linked to the PoRB and established with the specific objective of attracting local and foreign direct investment into export-orientated and industrial projects, such as the proposed Project. The location of the Project site within the RBIDZ estate, specifically Erf 16673, was identified by the RBIDZ in consultation with the Applicant, as part of the RBIDZ's mandate to allocate land within its estate to suitable investors in line with its broader industrial development and zoning strategy.

The Project's siting is based on a number of material advantages presented by the RBIDZ location, rather than an independently commissioned, multi-site comparative assessment. These advantages include:

- Appropriate zoning — the site carries a current zoning designation of "Noxious Industry," which specifically accommodates industrial processes of the nature, scale, and emissions/nuisance profile associated with a large gas-fired power generation facility, without requiring rezoning or associated planning risk.
- Availability of bulk services — the RBIDZ, as a purpose-built industrial estate, provides access to established or planned bulk infrastructure corridors (electrical grid connection, water supply, sewers, and road access) suited to large industrial users, reducing the scope and complexity of off-site infrastructure development that an unserviced greenfield site elsewhere would require.
- Strategic location and proximity to the PoRB — the site's proximity to the PoRB is of particular relevance to the Project, given the dependency of the proposed gas supply arrangement on the ZET and associated pipeline infrastructure being developed at the port, as described elsewhere in this Project Description. A site located outside of the RBIDZ, and by extension further from the port and its associated gas import infrastructure, would introduce substantially greater fuel supply logistics complexity, cost, and technical risk.

- Alignment with the RBIDZ's investment mandate — the RBIDZ, as a state-owned Special Economic Zone entity, actively identifies and allocates sites within its estate to investors whose projects align with its strategic objectives, and did so in this instance in direct consultation with the Applicant, reflecting a level of institutional support and administrative alignment not readily replicable at an alternative, non-RBIDZ site.
- Gas turbine performance derates significantly with altitude, hence locating the power plant in Richards Bay, close to sea level, optimises this characteristic of gas turbine performance.

Given the combination of these factors - particularly the site's existing industrial zoning, its direct locational dependency on port-based gas import infrastructure central to the Project's fuel supply strategy, and its identification through direct engagement with the RBIDZ as the responsible zone administrator - no alternative sites were formally considered or comparatively assessed as part of this EIA. The Applicant considers the Erf 16673 site to represent the only practicably available and strategically appropriate location for the Project within the context of its intended gas-to-power procurement route and dependency on the co-located LNG import infrastructure at the PoRB.

10.2.3 Fuel Type

This Project is intended to form part of the national IRP allocation of gas fired baseload power generation forming part of the cleaner transitional technologies contemplated within the IRP. The intention being to facilitate the replacement of the aging coal fired power plant fleet.

Combustion turbines are capable of firing on a variety of fuels, however, most commonly natural gas or light distillate oil is used. The combustion system of the proposed Plant will be configured for sulphur free natural gas fuel. Additionally the gas turbines selected will be capable of running on mixtures of up to 30% hydrogen should sufficient volumes of hydrogen become available in the future. As gas turbine technology advances the combustion systems can potentially be modified to allow higher percentages of hydrogen firing.

In terms of base load power running on hydrocarbon fuel the above is considered the cleanest best available technology option and therefore no fuel alternatives were considered for this Project. Relative to coal fired power, natural gas produces around 25% of the CO_2, no particulate, no SOx, and NOx, CO and UHC are well within acceptable World Bank emission limits, less than 25 ppmvd @ 15% O_2.

For purposes of this EIA, backup diesel supply has been included as an option in case grid and commercial considerations require this. The fuel will be ULSD (ultra-low sulphur diesel) and only 3 days of backup gas turbine firing has been considered. With further development of the power plant in conjunction with the development of the ZET system, it is foreseen that the reliability of the terminal together with the connection to the Lilly gas pipeline that potentially the back-up diesel system for gas turbine firing can be eliminated altogether.

In addition, there are emergency diesel generators, potentially black start diesel generators and diesel fire water pumps, see Section 9.6.1.5, but these items will be seldom utilised.

10.2.4 Project Size

The project size is based on a 750MW PPA from the Ekurhuleni Municipality using GE 9F.03 gas turbines which will deliver approximately 720MW when located at the proposed site.

Currently worldwide there has been a massive spike in the demand for gas turbines driven primarily by data centres and a global transition to cleaner generation technologies. For this reason, the gas turbine lead times from the 4 main OEM's has increased to between 3 to 5 years. The OEMs are all attempting to increase their manufacturing capability but currently this is still way behind demand. The project has not yet secured the gas turbines and this will be done based on the EIA progress and the ability of the Project to raise financing. Once financing is in place the gas turbine technology selection will be based on the best combination of size, gas turbine availability and gas turbine efficiency.

As the gas turbines are manufactured to specific sizes and the selection will try to achieve the 750MW as a minimum with a 2-2-1 configuration (2 gas turbines, 2 HRSG's and 1 steam turbine) the final capability is likely to be greater than the 750MW specified, potentially as high as 900 MW.

10.2.5 Turbine Technology

The Plant will likely comprise two (2) heavy-duty, 50 Hz, F-class gas turbines arranged in a 2+2+1 combined cycle configuration, but the specific gas turbine has not yet been selected.

The two most likely turbines currently under consideration are the General Electric (GE) 9F.03 and the Siemens Energy SGT 5-4000F units. Plant performance modelling completed to date has been based on the Siemens Energy SGT5-4000F, with either the SGen5-2000P or SGen5-2000H generator. Note the generators will have hydrogen cooling.

A comparison of plant performance using the two different gas turbines is shown in Table 25. Note that these figures are for the air-cooled, running at or close to 750MW. The GE9F.03 is only capable of 720MW in the Richards Bay ambient conditions whereas the Siemens unit is capable of 860MW at full load but the partial load figures are provided below giving close to 750MW.

Table 25: Comparison between Siemens and General Electric turbine choices

Parameter	Siemens SGT5-4000F	General Electric 9F.03	Unit
Net fuel / energy input (LHV)	1,356,078	1,309,670	kW
Net electrical output	757,168	718,974	kW
Net heat rate (LHV)	6,448	6,558	kJ/kWh
Net electric efficiency (LHV)	55.84	54.9	%

Parameter	Siemens SGT5-4000F	General Electric 9F.03	Unit
Specific CO_2 production	343.9	350.3	Kg/MWh

The Siemens unit even at part load offers slightly improved efficiency and this results in slightly improved emission performance.

The Siemens option is preferred at this stage, not only due to its superior performance, but also due to the anticipated shorter delivery time.

In looking for the final gas turbine model all four manufacturers will be considered with the best offering of the 4 being the final selection. Ansaldo and Mitsubishi are the two other alternatives. All 4 manufacturers offer similar performance and efficiencies.

10.2.6 HRSG and STG Technology

As efficiency is critical for both fuel consumption and emissions, assuming an F Class turbine in a 2-2-1 configuration, the HRSG will have a 3-pressure reheat configuration to maximise efficiency. The steam turbine will be sized to match the output of the HRSG and will therefore have three drums and three pressure stages.

In a 3-pressure reheat configuration the HP steam expands through the steam turbine HP section driving the steam turbine and generating power. The exhausted HP steam then returns to the boiler where it is combined with the IP steam and passes through a reheat superheater stage before being expanded through the IP section of the steam turbine.

The IP steam is then combined with the LP steam from the HRSG and expanded through the LP section of the steam turbine before passing to the condenser.

10.2.7 Cooling Technology

There are three main cooling technologies used in CCGT power plants: direct sea water cooling, wet (evaporative) cooling (WC) and dry air-cooled cooling (ACC). The technologies perform the same fundamental function - condensing exhaust steam from the steam turbine to maintain a low condenser backpressure and maximise cycle efficiency - but they differ significantly in water consumption, thermal performance, capital cost, and suitability for different climates.

Direct sea water cooling requires large volumes of sea water passing through the condenser and is not suitable in this case as the power plant is located too far from the sea and it is not practical to get these volumes of sea water to the power plant.

Wet cooling systems use evaporative cooling towers to reject heat from the condenser cooling water to the atmosphere. Warm circulating water from the surface condenser passes through a cooling tower where a fraction evaporates, removing latent heat and reducing the temperature of

the remaining water before it is recirculated to the condenser. Wet-cooled CCGT plants achieve the lowest condenser pressures, typically 5–10 kPa(a), resulting in the highest steam turbine output and overall plant efficiencies. However, they require substantial make-up water to replace evaporation, drift and blowdown losses.

Dry cooling systems reject heat directly to ambient air using large air-cooled condensers, eliminating the largest process water consumer. Exhaust steam flows through finned tubes arranged in modules while large electrically driven fans force ambient air across the tube bundles to condense the steam. Dry cooling reduces water consumption significantly compared with wet cooling, making it the preferred technology in arid regions. The trade-off is a higher condenser backpressure, particularly during hot weather, which reduces steam turbine output and overall combined-cycle efficiency. On high ambient temperature days, a dry-cooled 750 MW CCGT plant may experience a 2–6% reduction in net output and a 0.5–2 percentage point decrease in net efficiency compared with an equivalent wet-cooled installation. Dry cooling also has a higher capital cost, larger physical footprint, and greater auxiliary power demand due to the large condenser fans.

An important consequence of wet cooling is the generation of cooling tower blowdown, which constitutes the largest continuous liquid effluent stream from most CCGT power plants. As water evaporates in the cooling tower, dissolved salts, silica and other impurities remain in the circulating water, causing their concentration to increase. To maintain acceptable water chemistry and prevent scaling, corrosion and biological fouling of the condenser and cooling water system, a portion of the circulating water is continuously or intermittently discharged as blowdown and replaced with fresh make-up water. The volume of blowdown depends on the cycles of concentration (typically 3–7) and the quality of the make-up water but generally represents 15–30% of the evaporative water loss.

For the purposes of this document, and to ensure that the environmental assessment addresses the more onerous of the two options, the water-cooled (evaporative cooling tower) case has been adopted as the design basis presented throughout this document, including for water demand, effluent generation, and associated chemical consumption.

Water consumption for the air-cooled and water-cooled cases is shown in **Table 26**.

Table 26: Water consumption comparison between water-cooled and air-cooled cases

Water Service	Source	Water-Cooled Case L/d	Air-Cooled Case L/d
Potable water	RBIDZ potable water system	6,000	6,000
Demin feed and service water	RBIDZ potable water system and/or bulk clarified water system	409,000	409,000
Cooling tower makeup	Bulk clarified water, or other	21,000,000	0
Total water consumption		**21,415,000**	**415,000**

As described above, due to the improved condenser vacuum, the water-cooled case offers superior efficiency and therefore lower emissions per unit of power produced. **Table 27** compares the efficiencies and emissions for the two cases. The water-cooled case shows a 0.7% increase in net plant efficiency and a 5kg decrease in CO_2 emissions per MWh produced.

Table 27: Estimated CCGT Emissions (water vs dry cooling comparison)

Parameter	Water Cooling	ACC Dry Cooling	Unit / basis
Power Plant Net Efficiency	56.67%	55.83%	
Exhaust gas NOx (as NO_2) content	25	25	ppmv, @ 15% O_2, dry
Exhaust gas CO content	25	25	ppmv, @ 15% O_2, dry
Exhaust gas UHC content	5	5	ppmv, @ 15% O_2, dry
Emissions: CO_2 per MWh	338	343	kg/MWh
Emissions: NOx as NO_2 per MWh	0.2665	0.271	kg/MWh
Emissions: CO per MWh	0.1622	0.165	kg/MWh
Emissions: SOx as SO_2 per MWh	0	0	kg/MWh
Emissions: UHC as CH_4 per MWh	0.0186	0.0189	kg/MWh

Furthermore, during periods of hot weather, the air-cooled case will experience a greater decrease in production capacity, since cooling capacity will be reduced, resulting in a higher condenser pressure.

The key trade-offs between the two technologies is, in essence, water consumption and effluent generation versus thermal efficiency, capital cost, footprint, and noise. The wet-cooled option achieves higher plant thermal efficiency, lower emissions and lower capital cost, and is more common globally for large thermal power plants where water is available. This efficiency advantage becomes more pronounced during hot weather, which is also when an air-cooled condenser's performance penalty is most significant, as noted above.

Given the uncertainty at this stage of project development regarding the Applicant's final water source and bulk supply arrangements with UUW, as noted elsewhere in this Project Description, the selection between wet and dry cooling remains an open design decision to be resolved during the Feasibility Study phase, informed by:

- The outcome of water supply discussions;
- The EA (if granted);
- Efficiency and emissions; and
- Life-cycle operating costs (capex, water cost, water treatment and other costs).

10.3 No-Go Option

The no-go alternative refers to the option of not proceeding with the Project, whereby the site would remain in its current state and the associated generation capacity, employment, and infrastructure investment would not be realised.

From a purely local environmental perspective, the no-go alternative would avoid the impacts associated with construction and operation of the Plant, including water abstraction, effluent generation, air emissions, noise, and traffic described elsewhere in this report, and the site would remain available for an alternative form of development consistent with its existing "Noxious Industry" zoning within the RBIDZ.

However, the no-go alternative must be weighed against the broader strategic and policy context set out earlier in this chapter. South Africa's electricity system continues to require new dispatchable generation capacity to support grid stability, accommodate the ongoing renewable energy rollout, and address the anticipated tapering of existing regional gas supply.

The Project has been identified as a means of contributing to the approximately 3 000 to 6 000 MW of new gas-fired generation capacity determined as necessary under successive iterations of the IRP, procured through the GASIPPPP and/or other suitable gas-to-power procurement mechanisms. Should the Project not proceed, this contribution to national energy security would not be realised, and the associated economic benefits - including construction and operational employment, and the demonstration effect for further investment within the RBIDZ and the broader Richards Bay gas value chain (including the ZET) - would similarly not accrue. Higher volumes of gas passing through the ZET system would allow for a lower gas tariff and in turn allow all the new projects in the area using the ZET facility to generate power at lower electrical tariffs.

The no-go alternative would not, in itself, reduce national electricity demand or the identified need for new generation capacity; it would simply mean this need is met by another project, another location, or not met at all within the intended timeframe, with attendant risk to energy security objectives.

On balance, given the Project's alignment with national energy policy, its site-specific advantages within the RBIDZ, and the absence of any identified fatal flaw at this stage of assessment, the no-go alternative is not considered the preferred option.

11 PROFILE OF THE RECEIVING ENVIRONMENT

11.1 Introduction

This section provides a general description of the status quo of the receiving environment in the project area. This serves to provide the context within which the EIA was conducted. The study area includes the entire footprint of the Project components. This section allows for an appreciation of sensitive environmental features and possible receptors of the effects of the proposed Project. The potential impacts to the receiving environment are discussed in Section 13 below.

Where necessary, the regional context of the environmental features is also explained, with an ensuing focus on the local surrounding environment. The reader is referred to Section 12 below for more elaborate descriptions of the specialist studies and their findings for specific environmental features.

11.2 Land Use

The Project's siting is based on the advantages posed by the RBIDZ, including the appropriate zoning, availability of services and strategic location (including proximity to the PoRB).

The site is currently vacant. Properties to the immediate north and west of the site are also undeveloped. Richards Bay Alloys (formerly Tata Steel) is located more than 200m to the west of the site. The erf bordering the site to the south-west contains a wetland (known as remainder of Wetland B). Photographs of the site are contained in Figure 21 to Figure 26 below.

According to the CoU 2021 Land Use Scheme Viewer, the current zoning of the site is "Noxious Industry" (refer to Figure 27 below). The land located to the north and west, which also falls within the RBIDZ, has the same zoning. The land to the south and east of the site is zoned as "General Industry". Residential areas within a 5km radius of the site include Wild en Weide, Veld en Vlei, Brackenham, Aquadene, Birdswood, and Richard's Bay Central. The Richards Bay Cemetery is located approximately 1.2km to the north.

According to the uMhlathuze Single Land Use Scheme Regulations (28 April 2021), the Noxious Industry Zone permits manufacturing uses which may not be compatible with other manufacturing uses and which would have major externalities on adjacent land uses.



Figure 21: North-eastern view of the site



Figure 22: South-western view of the site



Figure 23: South-western view of Richards Bay Alloys



Figure 24: North-western view of the site from Alumina Allee Road (Google Earth™)



Figure 25: North-eastern view along the eastern boundary of the site



Figure 26: Southern view along the eastern boundary of the site

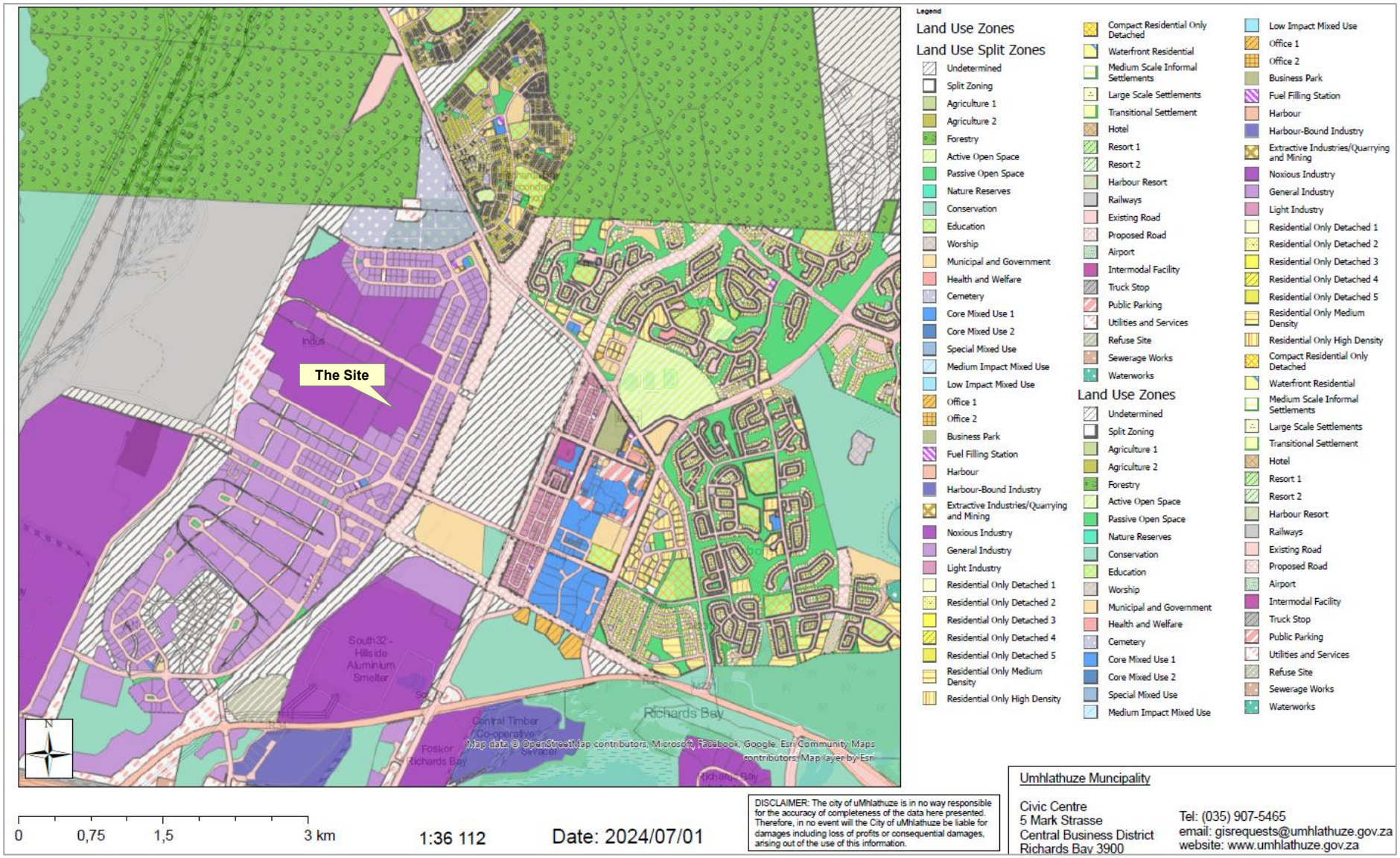


Figure 27: Zoning of the project site and surrounding area (source: CoU 2021 Land Use Scheme Viewer)

11.3 Land Cover

The land cover in the project area is shown in Figure 28 below. According to this map, the land cover at the site consists of natural grassland.

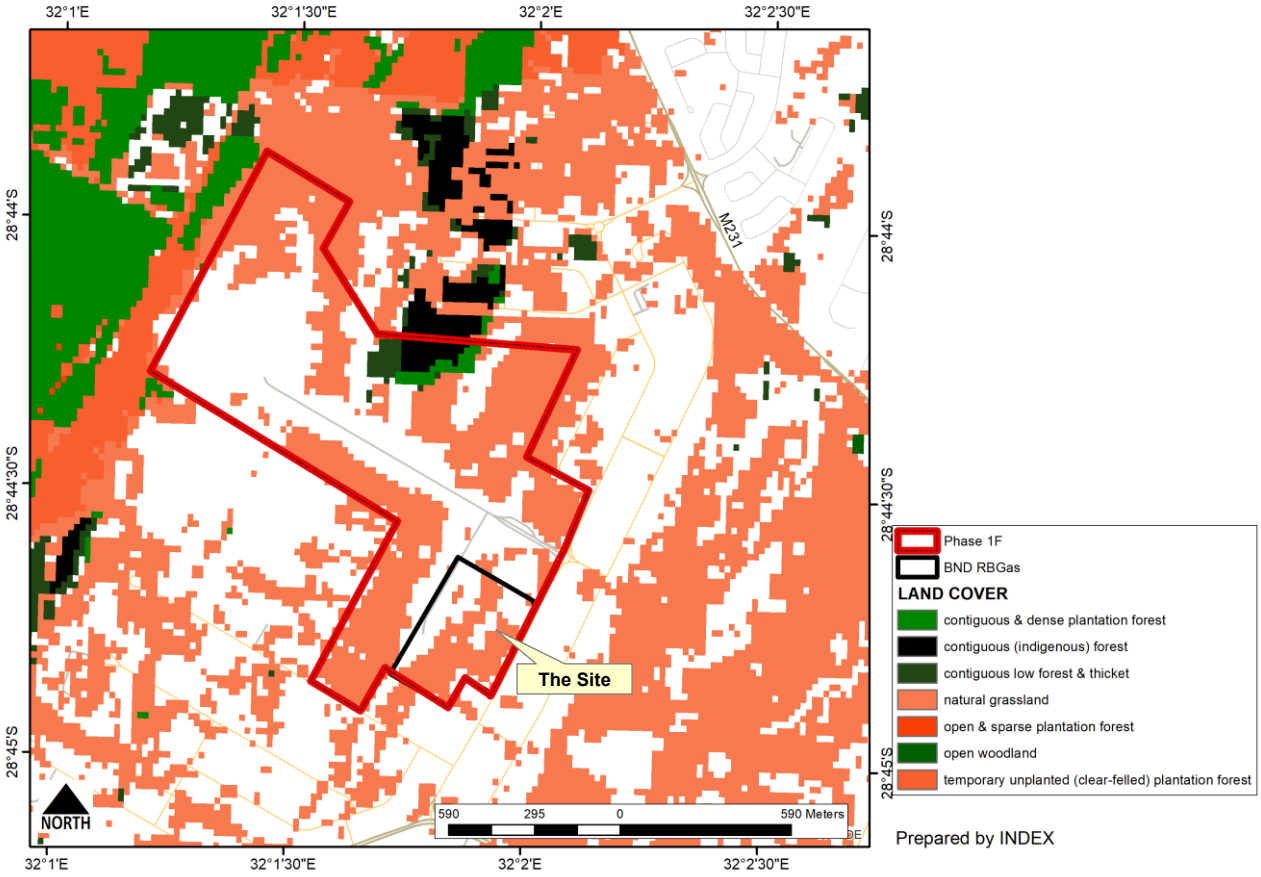


Figure 28: Land cover in project area (Index, 2024)

11.4 Climate

The following information was extracted from the Climate Change Impact Assessment (Promethium Carbon, 2026). Refer to Section 12.4 below for a synopsis of the study. The specialist report is contained in **Appendix E1**.

11.4.1 Current Climate

The Project falls within the temperate, no dry season, hot summer (Köppen-Geiger) climate zone, experiencing a humid subtropical climate where summers are warm with rainfall, whilst winters are mild and relatively dry (see Figure 29). The mean annual temperature for the project area is 21.25°C. Mean maximum temperatures range from 29°C in early summer (December and January) to 23°C in winter (June and July). Mean minimum temperatures range from 15°C in winter to 23°C in summer (see Figure 29).

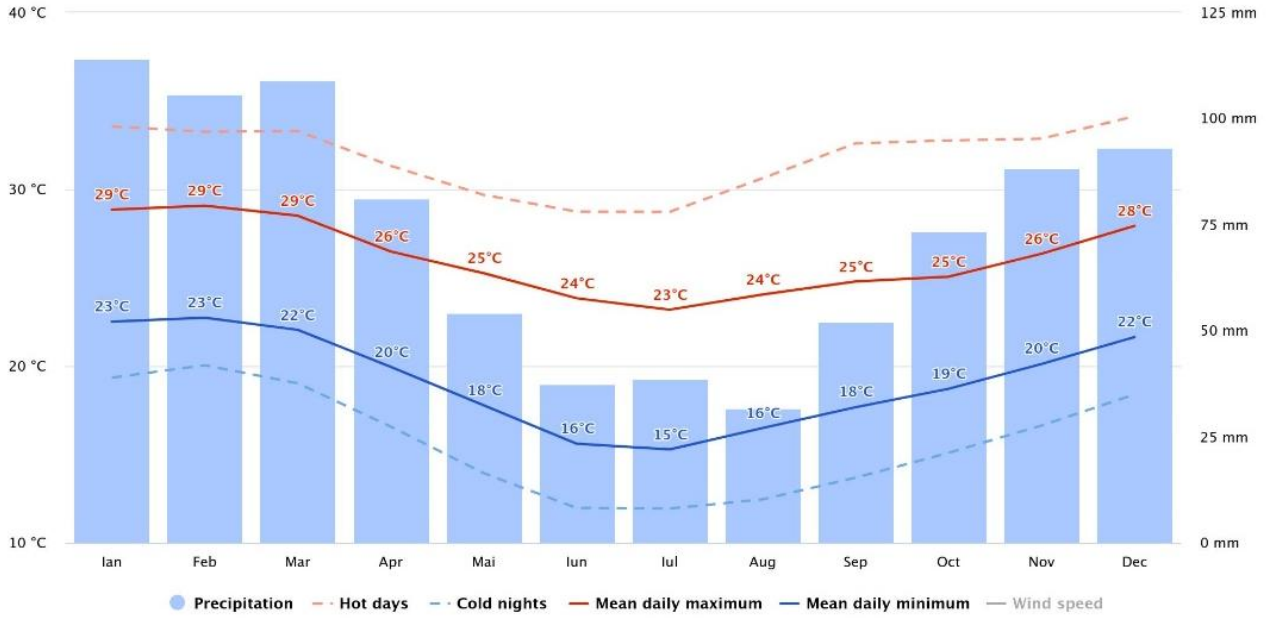


Figure 29: Average historical temperature and precipitation for Richards Bay over the last 30 years (data source: Meteoblue as cited in Promethium Carbon, 2026)

The mean wind speed at the project site is approximately 6.8 m/s, peaking in November. The prevailing winds are from the north-east between March and October and south-east from October to March.

11.4.2 Climate Change

Understanding future climate change impacts relies on analyses of both near-historical observations and future projected and modelled climate data. Weather-related risks relevant to the Project are primarily driven by increasing temperatures and declining rainfall. However, high-impact, low-probability (HILP) events, such as extreme rainfall and flooding, pose significant risks in the context of increasing global climate variability.

According to Promethium Carbon (2026), the projected climate changes in the region include:

- Increasing temperature and increases in warm extremes are virtually certain, with Richards Bay already experiencing comparatively high frequencies of very hot days (exceeding 35°C). Looking ahead, district-average temperatures are virtually certain to increase across all future periods, with warming of ~1°C possible in the near-term and substantially higher warming under low mitigation pathways by late century. This will increase the likelihood of heatwaves and compound hazards such as high fire danger days.
- Rainfall patterns show a strong coastal gradient, with baseline mean annual rainfall increasing from ~800 mm in the north-west to >1 300 mm in the north-eastern coastal zone. Observations suggest a decrease in mean annual rainfall (low confidence), but a high-confidence increase in extreme rainfall frequency, with Richards Bay and adjacent coastal areas experiencing some of the highest observed extreme rainfall-day frequencies. Projections maintain low

confidence in the direction of change in total annual rainfall by mid-century, but the signal for extremes is stronger: extreme rainfall events are likely to become more frequent, reinforcing a hazard framing of more intense rainfall episodes even where mean rainfall trends remain uncertain.

- Hydrologically, projections indicate growing drought and water-stress pressure over time. The Project is in a low-medium water-stressed basin with extremely high water use, and current drought risk is medium, with overall stress and seasonal variability expected to remain low-medium through ~2050 on current trajectories. Consistent with this, local evidence points to increasing meteorological and agricultural drought pressure over time (with confidence increasing toward the far future), driven in part by virtually certain warming that raises evaporative demand and can lengthen dry spells between heavier rainfall events.
- Coastal processes introduce an additional long-term hazard pathway. Observed sea level at Richards Bay increased by 2.7 ± 0.6 mm/yr. According to Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6), projections indicate further rise of ~10-40 cm by 2050 across scenarios, with ~1 m possible by 2100 under very high emissions. This will increase baseline coastal water levels and can amplify storm surge and coastal flooding impacts during severe weather.
- Finally, the site's coastal proximity elevates exposure to HILP events, including severe coastal storms, cut-off lows with subtropical characteristics, and tropical cyclones. The intensity of extreme weather systems affecting South Africa's north-east coast is projected to increase, making it less reliable to rely only on past conditions to inform design. These events can cause disproportionate damage (flooding, wind damage, electrical/mechanical failure, access disruption), requiring explicit design and operational planning for rare but severe conditions (e.g., elevation and flood protection of critical assets, extreme wind loading, stormwater and drainage, and emergency response and recovery planning).

11.5 Geology and Soil

11.5.1 General

The regional geology of the area is shown in Figure 30 below. According to Engeolab (2024), the site is located on unconsolidated sediments of the Maputuland Formation and is blanketed by grey, loose cover soils underlain by clay-silt-sand mixes up to 30m. The soil profile is dominated by fine to medium grained sand with subordinate clay and silt fractions. These soils are highly compressible with low bearing capacities and unless some form of ground improvement is carried out, settlement of structures may occur. The soil classes are shown in Figure 32 below.

The soil map is presented in Figure 33, while descriptions of the identified soil types are provided in Table 28. The information is based on field observations undertaken using a soil auger and soil probe as part of the Agricultural Agro-Ecosystem Assessment Statement (Index, 2024) that was prepared for the Project.

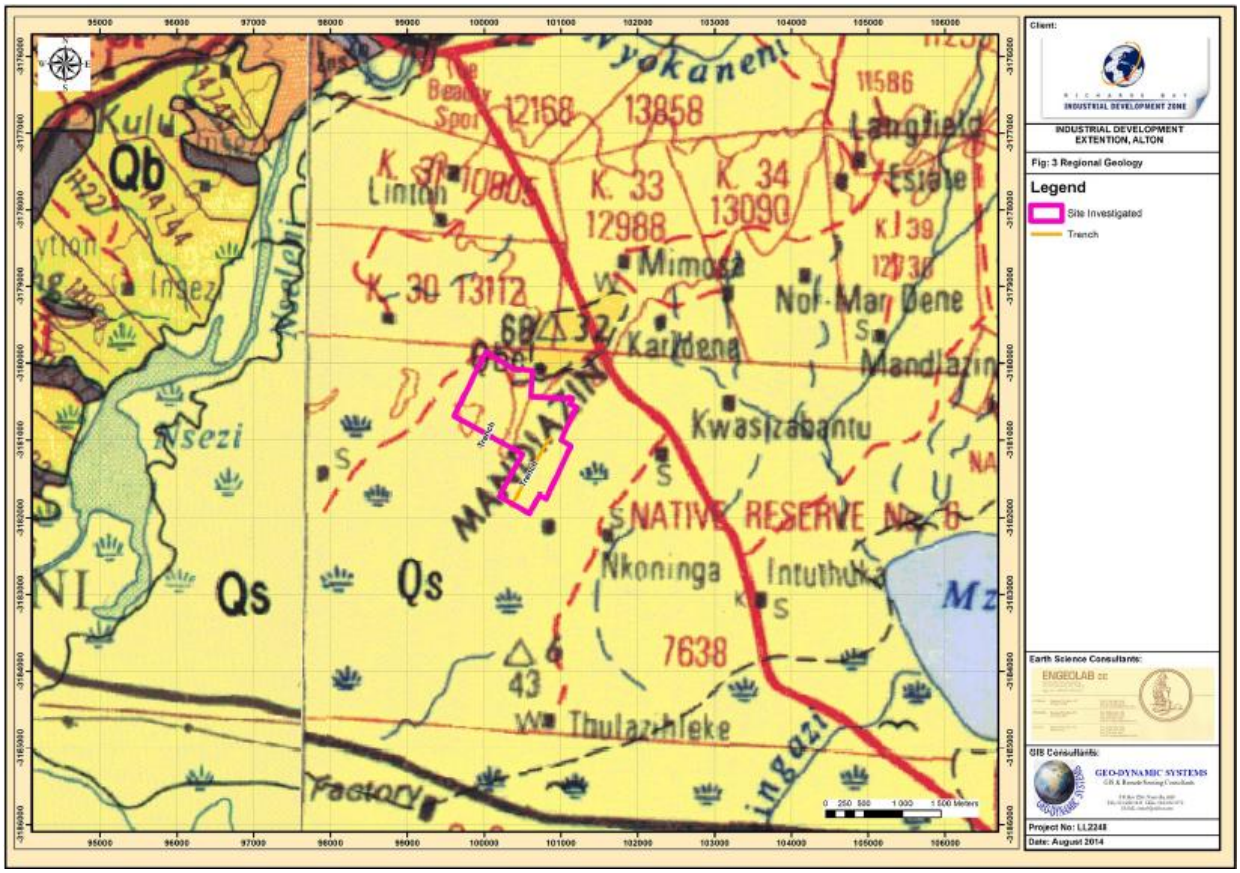


Figure 30: Regional geology of RBIDZ Phase 1F (Engeolab, 2014)

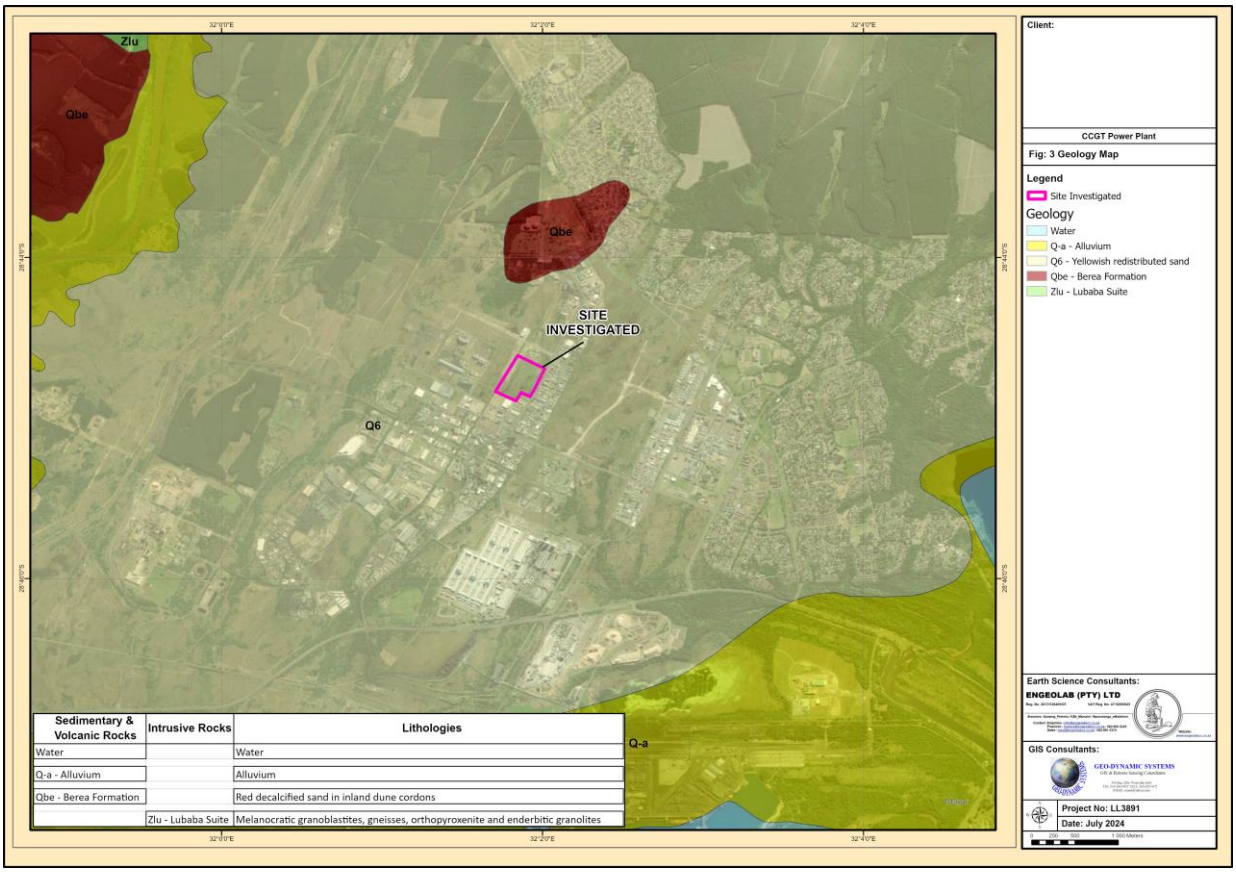
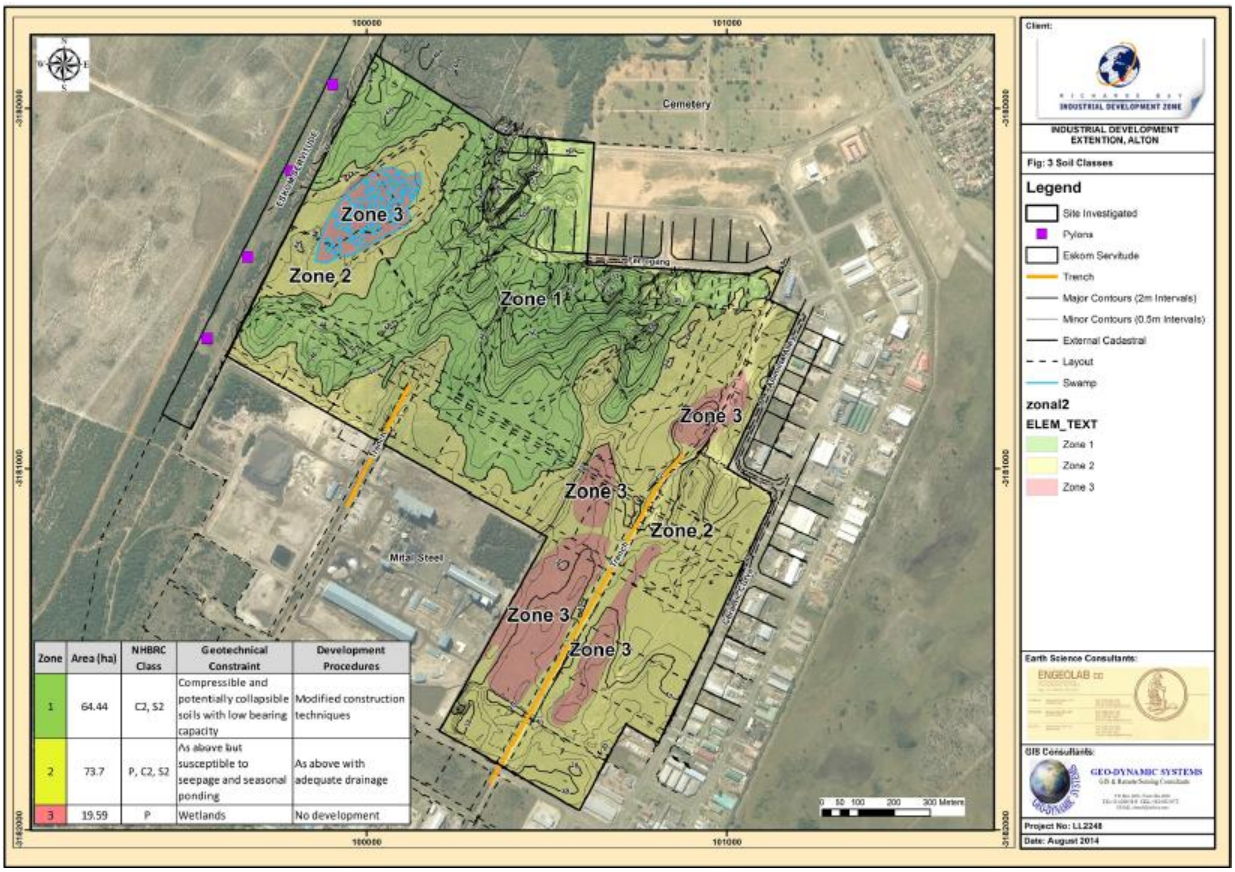


Figure 31: Geology map of the site (Engeolab, 2024)



Zone	Area (ha)	NHBRC Class	Geotechnical Constraint	Development Procedures
1	64.44	C2, S2	Compressible and potentially collapsible soils with low bearing capacity	Modified construction techniques
2	73.7	P, C2, S2	As above but susceptible to seepage and seasonal ponding	As above with adequate drainage
3	19.59	P	Wetlands	No development

Figure 32: Soil classes of RBIDZ Phase 1F (Engeolab, 2014)

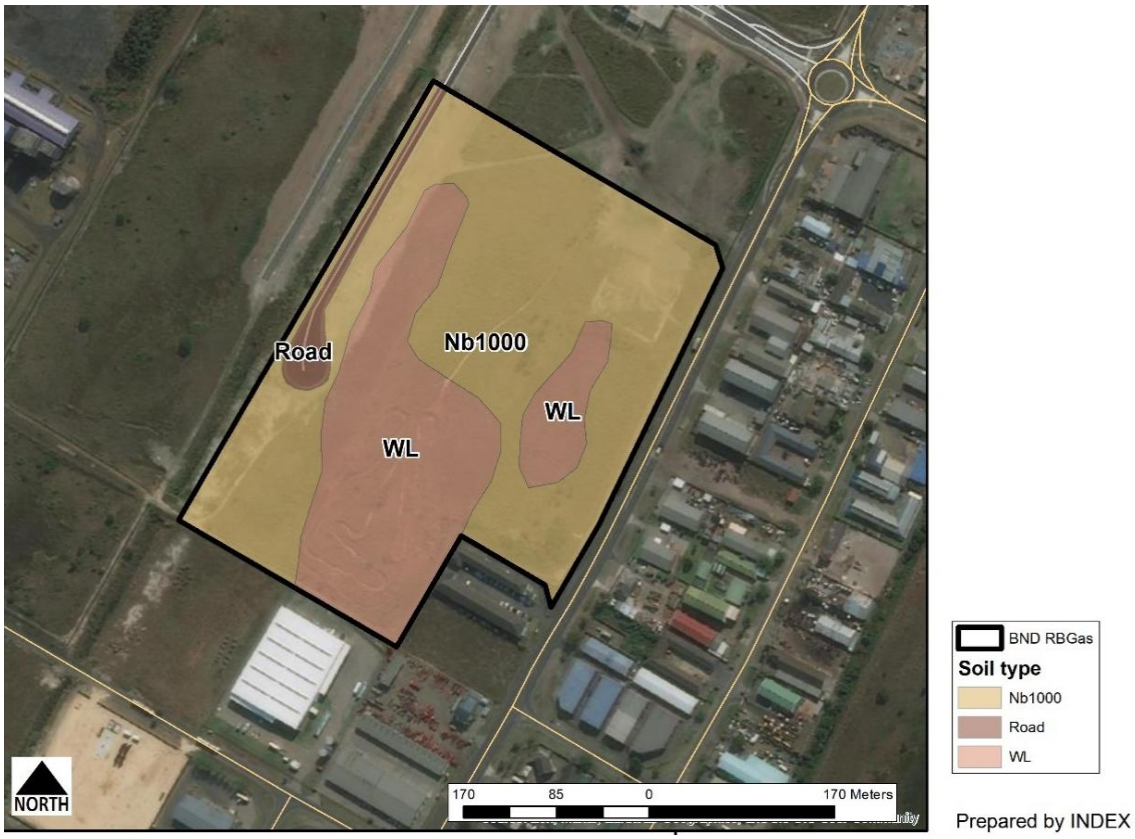


Figure 33: Soil map (Index, 2024)

Table 28: Soil descriptions (Index, 2024)

Map unit	Description
Nb1000	The entire site consists of wind-blown sands. The soil is very sandy, with a clay content of less than 10%, and a typical depth of over 1,000 mm. The topsoil is light greyish-brown with a single-grain structure and is free of stones or nodules. The subsoil is greyish-brown sand with a similar grain structure. During periods of high rainfall, the deeper subsoil may become water-saturated. The dominant soil form identified is Namib.
Road	Entrance road.
W	Waterlogged regic sand, which consists of uneven land that was previously used as a motocross race track.

11.5.2 Geotechnical Constraints

Geotechnical constraints at the site include the following (Engeolab, 2024):

- A densely rooted profile is present in the top 1m of cover soils;
- The area is subject to a shallow perched water table;
- The sandy cover soils tend to be highly permeable;
- Deep compaction of foundation materials is inhibited by a shallow perched water table;
- A competent shallow founding horizon for movement-sensitive structures is not present on site;
- Immediate collapse of excavations occurs within very moist to wet material >1.5m;
- Site soils are highly compressible and hence susceptible to settlements;
- Founding material characterised by a low bearing capacity;
- Good quality pavement construction materials need to be imported;
- Light structures should preferably be found on raft foundations with light reinforcing in masonry; and
- Heavy, vibrating structures need to be found on piles.

11.6 Hydrogeology

According to Thornhill & van Vuuren (2009), the groundwater associated with the CoU is directly controlled by the underlying geology of the area. The groundwater can be separated into the primary aquifer in the unconsolidated sediments (Richards Bay and eSikhawini) from the secondary aquifers in the older fractured rock system (Empangeni). The rate of recharge to the groundwater and the storage and discharge from the aquifers is hydrologically different for the two aquifer systems. In the primary aquifer the groundwater is stored in the pore spaces (matrix porosity) between the unconsolidated sand particles while it is mainly stored in fractures and fissures in the secondary aquifers with little storage in the pore spaces of the consolidated rock material. The groundwater has strong linkages to all the other water resources that function as drainage boundaries.

As shown in Figure 34 below, the groundwater flow is generally controlled by the presence of main drainage areas and follows the incline of the topography (Thornhill & van Vuuren, 2009).

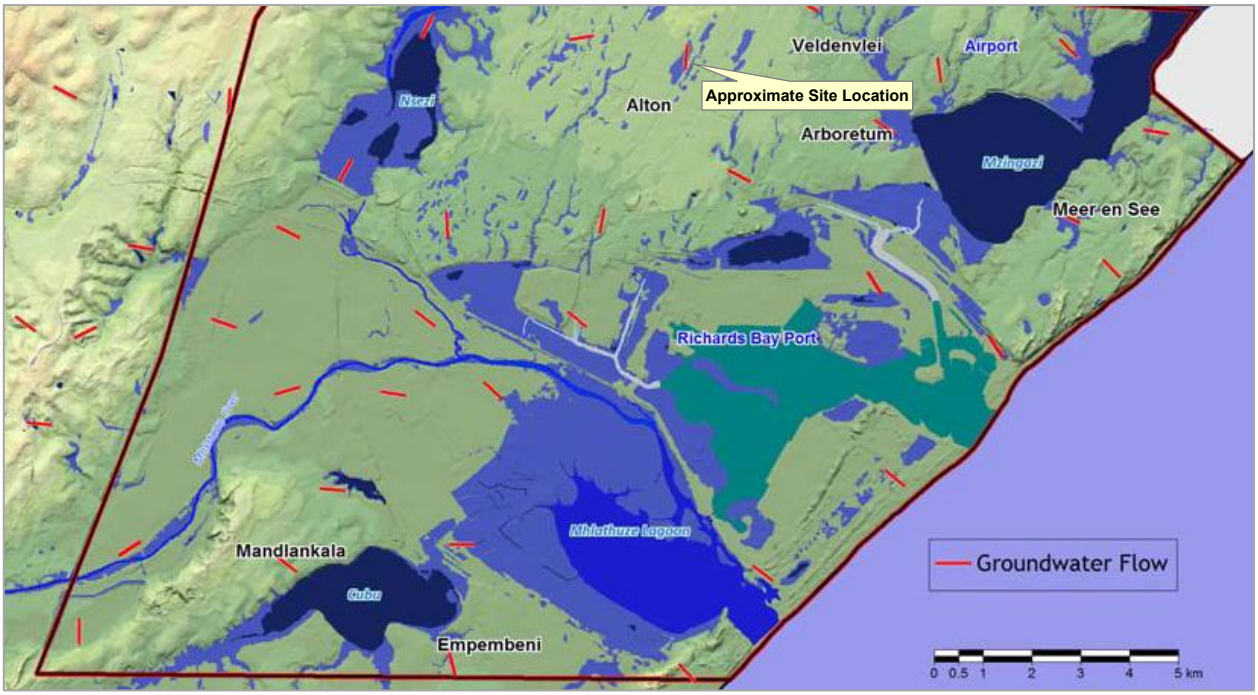


Figure 34: Groundwater flow following the incline of the topography (Thornhill & van Vuuren, 2009)

The site is located on the Zululand coastal aquifer associated with unconsolidated sediments of the Maputuland Group, characterised by an intergranular aquifer with a potential yield ranging from 0.5 to 2 l/s (see Figure 35 below). The shallow groundwater sources on site can be classified as typical marine waters with similar deeper sources inclusive of Ca-HCO3 type waters associated with fresh, deeper seated aquifers.

Surface run-off from the site drains in a south-westerly direction. According to Engeolab (2024), a fluctuating perched water table, which varies between 1.5 m and 3.3 m below natural ground level characterises the area. The water level depths on the RBIDZ Phase 1F site are shown in Figure 36 below. During high rainfall periods, a rebound of the perched water table usually occurs with shallow excavations and topographical depressions becoming waterlogged for extended periods (Engeolab, 2024).

According to Engeolab (2014), the high recharge rates, high to medium permeable residuum and high groundwater potential aquifer of substantial aerial extent, increases the aquifer significance as well as risk of groundwater pollution. Groundwater use in the catchment area is expected to be insignificant based on current records and therefore not a strategic resource in this area (Engeolab, 2014).



Figure 35: Coastal Aquifer (Engeolab, 2014)

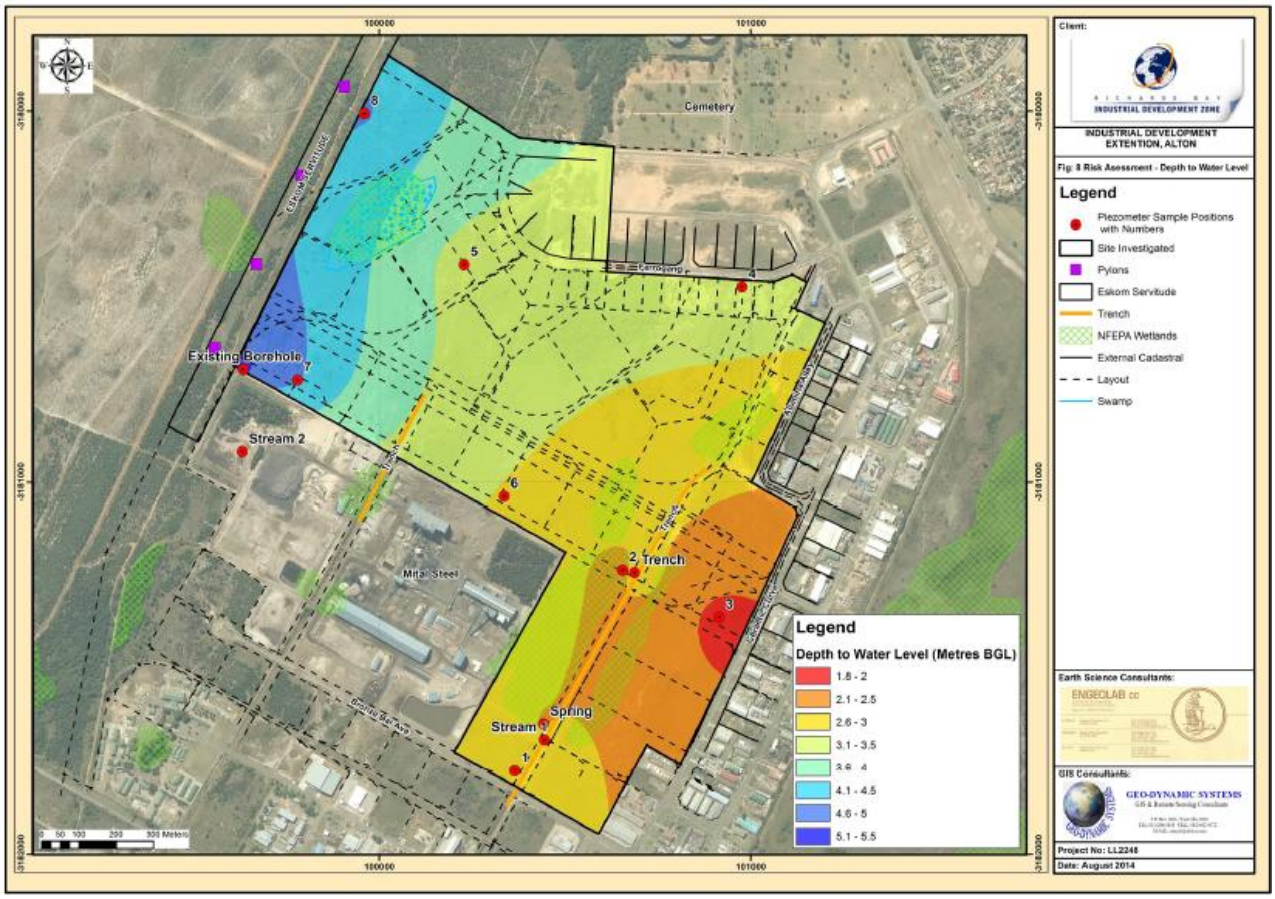


Figure 36: Depth to water level (Engeolab, 2014)

11.7 Topography

According to Thornhill & van Vuuren (2009), the nature of the topography in Richards Bay is typical of a coastal plain, which is generally defined as a low-relief area that is bounded by the sea on one side and by a high-relief terrain on the landward side.

The study area is characterised as a relatively flat landscape with some gradual slopes towards the south. The site falls within a landform classified as a “plain at a very low level” in terms of the SOTER database.

Elevations for the site area range from 40 to 43 metres above mean sea level (mamsl). The elevation profiles from the northern to southern as well as the eastern to western boundaries of the site are shown in Figure 37 and Figure 38 below, respectively. There is an elevation loss of approximately 1.65m from north to south.



Figure 37: Elevation profile of the site from northern to southern boundaries (Google Earth ™)



Figure 38: Elevation profile of the site from north-eastern to south-western boundaries ((Google Earth ™)

11.8 Surface Water

The sub-sections that follow describe the surface water resources within the project area.

A Freshwater Ecosystem Assessment (SAS, 2026) and a Hydrological Assessment (GCS, 2026) were undertaken for the Project. Summaries of these specialist studies are provided in Sections 12.6 and 12.10 below, respectively, while the full reports are included in **Appendix E3** and **Appendix E7**.

11.8.1 Hydrological Setting

Richards Bay is located in the Pongola-Mtamvuna Water Management Area (WMA 4). This WMA includes major rivers such as the Pongola, Mhlathuze, Mkuze, Thukela, Mvoti and Umgeni Rivers amongst various others. The location of Richards Bay in relation to the W1 secondary catchment is shown in Figure 39 below. The site falls within the W12F quaternary catchment (refer to Figure 40 below).

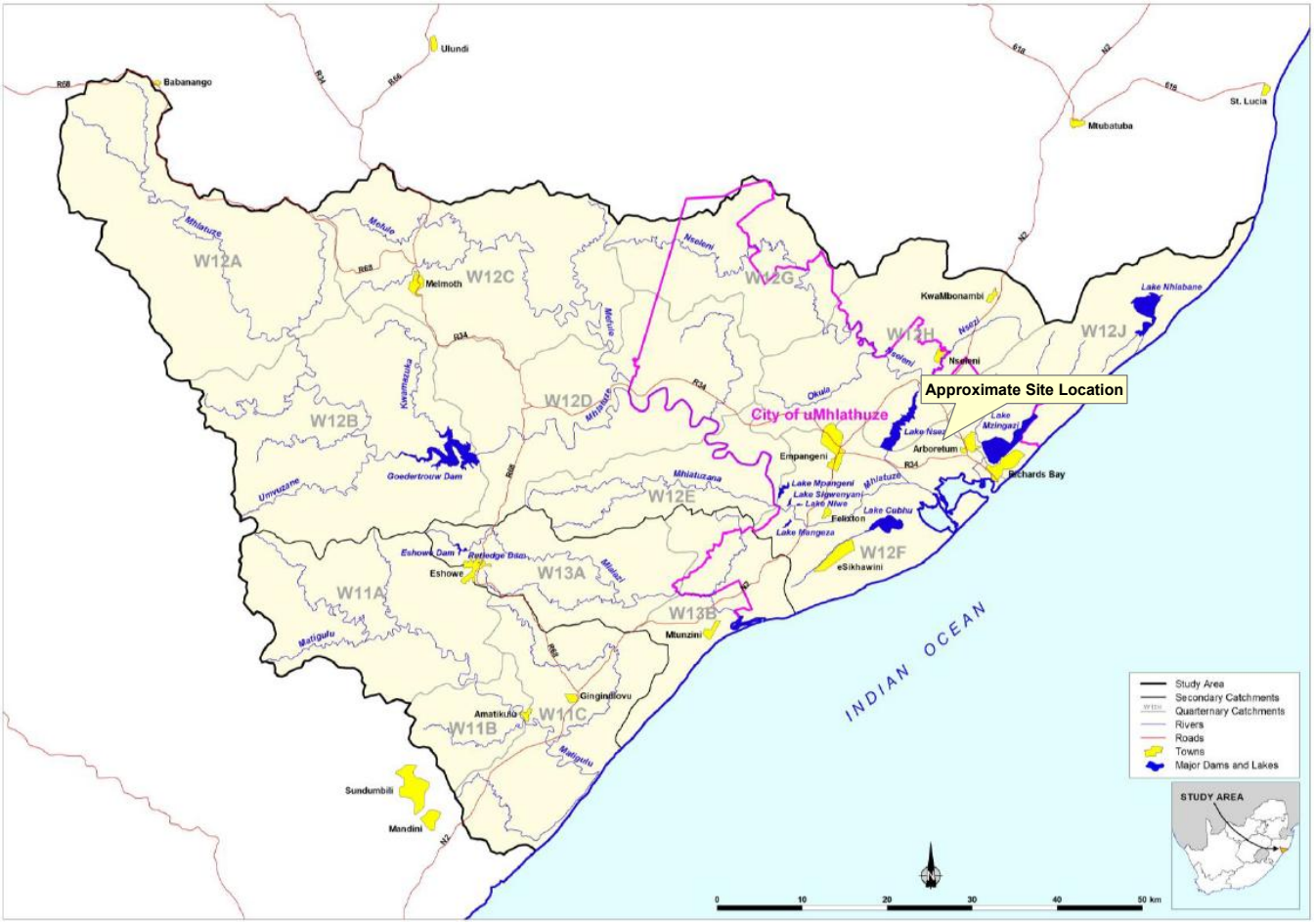


Figure 39: W1 catchment (Main River: Mhlathuze) (DWS, 2022)

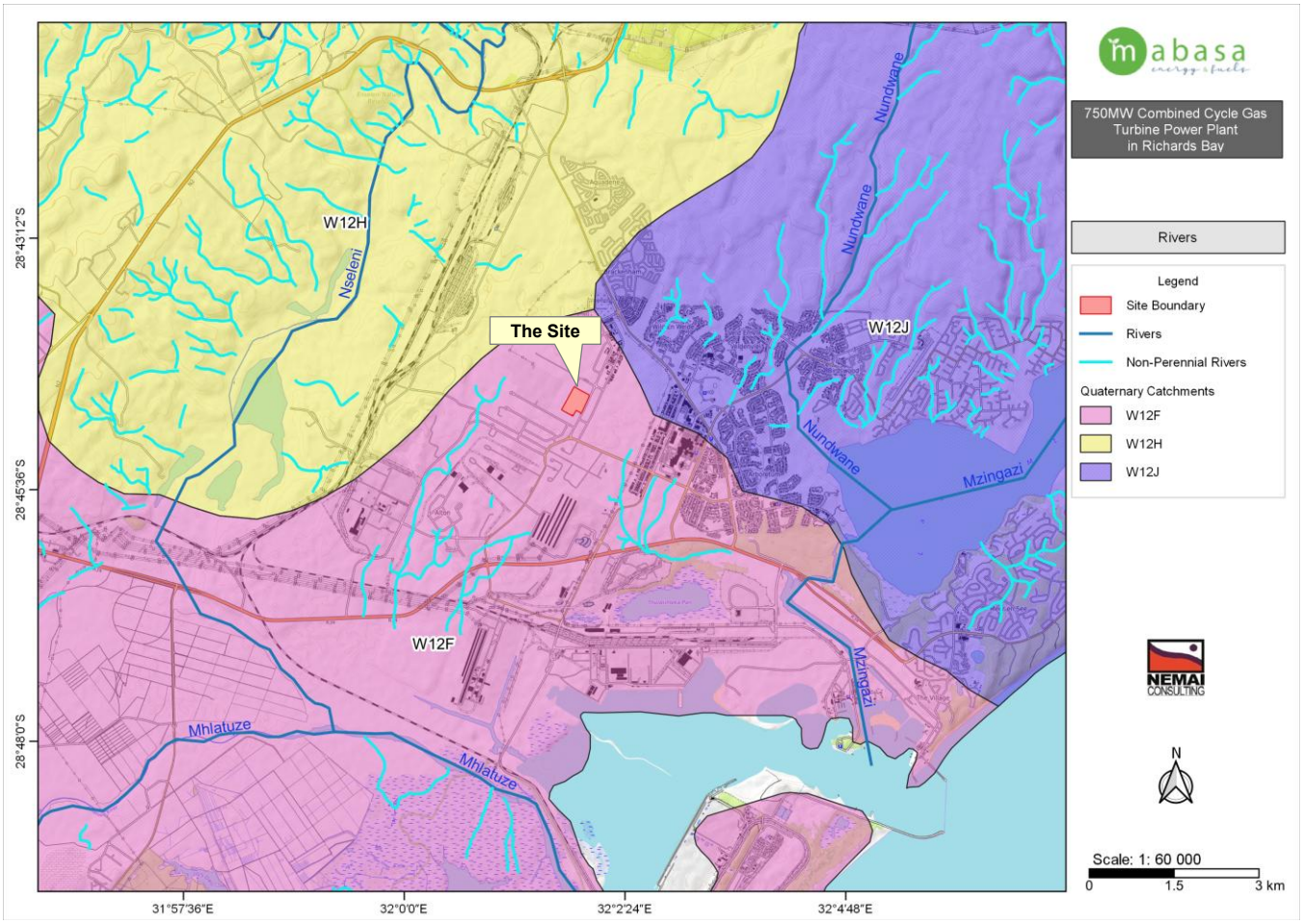


Figure 40: Rivers and quaternary catchments in relation to project area

11.8.2 Watercourses

The Nseleni River flows to the west of the RBIDZ Phase 1F, which is a major tributary of the Mhlathuze River. According to AECOM (2015), the Mhlathuze River is the largest river system within the uMhlathuze Estuary. It is characterised by a large flood plain that is exposed to intense exploitation and impacts upstream.

There are no rivers that traverse the site. The closest non-perennial stream (Bhizolo Stream) is approximately 1.2 km east of the site and a second non-perennial stream (Ngodweni Stream) is approximately 1.5 km to the south-east (see Figure 40 above). Although there are no recognised streams near the site, a stormwater canal (shown in Figure 41 and Figure 42 below) runs parallel to the western side of the site, which conveys stormwater from the RBIDZ in a south-westerly direction to a non-perennial stream (Mhlangabezani stream) about 3.7 km downstream of the site.

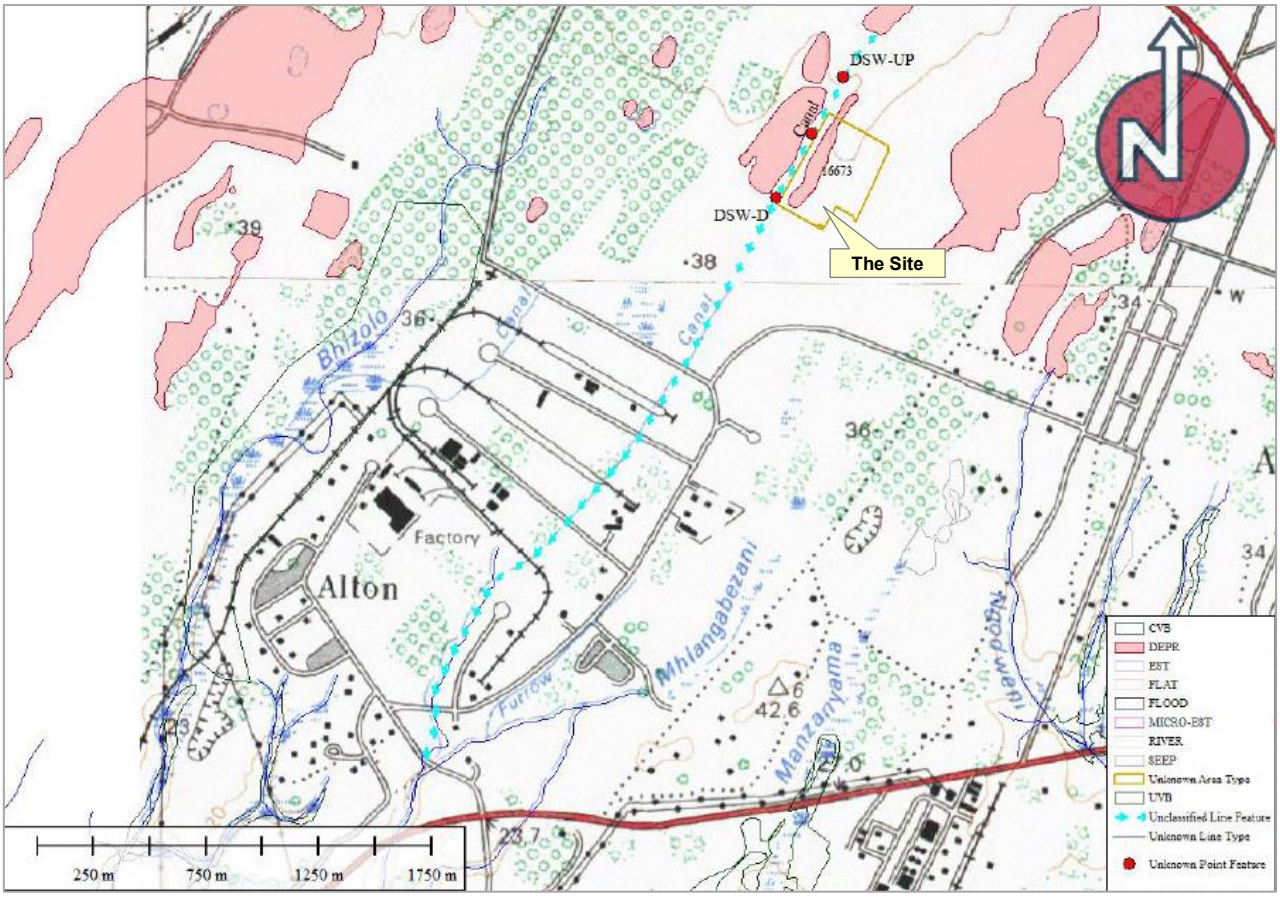


Figure 41: Topography map and canal drainage system



Figure 42: Canal along the western boundary of the site (Richards Bay Alloys shown on the right-hand side and the site is to the left)

According to DWS (2022), the majority of the wetlands within the Lower Mhlathuze catchment is classified with a Present Ecological State (PES) of D to F. The most notable wetlands are Mhlathuze swamp system and floodplain, Cubhu, Mzingazi and Thulazihleka.

Much of the hydrology of the area is linked with the shallow water table of the coastal plain. Wetlands in this area tend to be an expression of the groundwater/soil surface interface (Nemai Consulting, 2016). According to the National Biodiversity Assessment (NBA) 2018 National Wetland Map (NWM) 5 spatial data, a depression wetland occurs on the site (refer to Figure 43 below). As mentioned, various wetlands were infilled in the RBIDZ Phase 1F to allow for the development on these portions of land within the industrial estate (see Figure 6 above), under the requisite approvals in terms of NEMA and NWA. Two wetlands in the RBIDZ Phase 1F were conserved, which are shown in Figure 6 above. The depression wetland on the site was partially infilled, whilst a wetland (known as remainder of Wetland B) remains to the south-west of the site.

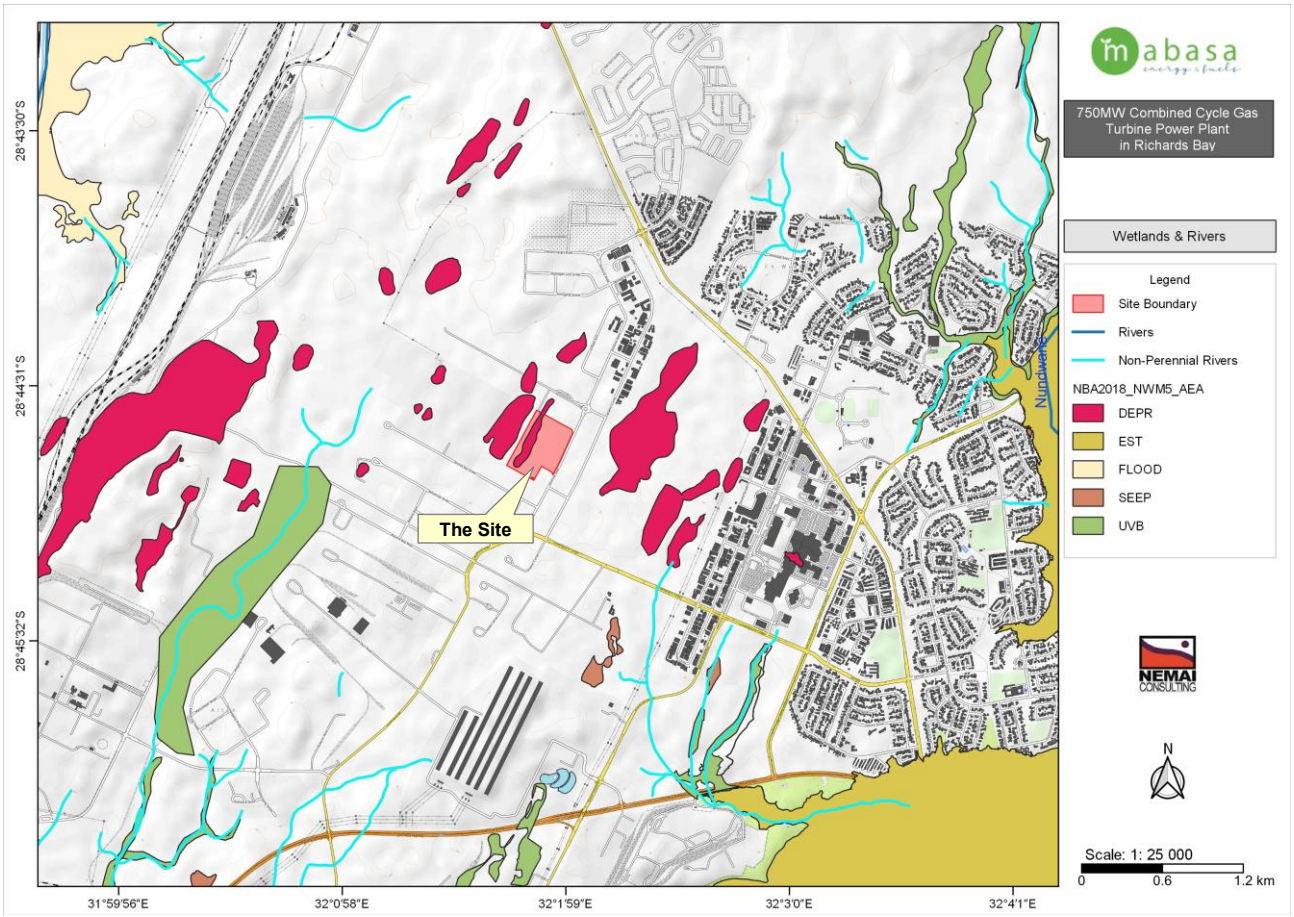


Figure 43: Wetlands and rivers in relation to project area

11.8.3 Strategic Water Source Area

A Strategic Water Source Area (SWSA) refers to either (a) areas that supply an uneven (large quantity) amount of mean annual surface water runoff in relation to their size and are therefore considered to be nationally important or (b) have high groundwater recharge and where the groundwater forms nationally important resource or (c) areas that meat both criteria (a) and (b) (Nel *et al*., 2013; Le Maitre *et al*., 2018). Areas that supply these disproportionate amounts of water can be because of climatic conditions such as high rainfall, or physical properties (ability of the soils and underlying weathered material and rocks to store water as groundwater) (Le Maitre *et al*.,

2018). In South Africa, 22 SWSA surface water and 37 SWSA groundwater areas has been identified to be strategically important at national level for water and economic security (Le Maitre *et al*., 2018).

The project area is situated in both the Richards Bay ground water-fed estuary SWSA and the Zululand Coast surface water.

11.8.4 DFFE Screening Tool

According to the Screening Tool, the site occurs in areas of very high and low sensitivity in terms of the Aquatic Biodiversity Theme (see Figure 44 below). The features that contribute to the very high sensitivity include wetlands and the Indian Ocean Coastal Belt Bioregion. It is evident that the mapped sensitivity in the Screening Tool is based on the NWM shown in Figure 43 above. According to the Site Sensitivity Verification (SSV) that was undertaken for this theme by an Aquatic Biodiversity Specialist, the sensitivity rating assigned by the Screening Tool is supported. This relates to the depression wetland on the site, which received authorisation to be infilled by RBIDZ.



Figure 44: Map of relative aquatic biodiversity theme sensitivity (Screening Tool)

11.9 Estuarine Environment

The uMhlathuze and Richards Bay Estuarine Management Plan (EstMP) (2018) defines the Estuarine Functional Zone (EFZ) to be the area below the 10 m topographical contour (as indicative

of +10 m above mean sea level) that includes the two adjacent lakes systems, largely reflecting their historical connectivity in the lower uMhlathuze catchment (refer to Figure 45 below). However, Lakes Cubhu and Mzingazi presently function as freshwater lakes as a result of their disconnection from the uMhlathuze/Richards Bay estuarine water bodies (DEA, 2018). At its closest point, the site is located approximately 2.6 km to the south of the EFZ of the Richards Bay Estuary.

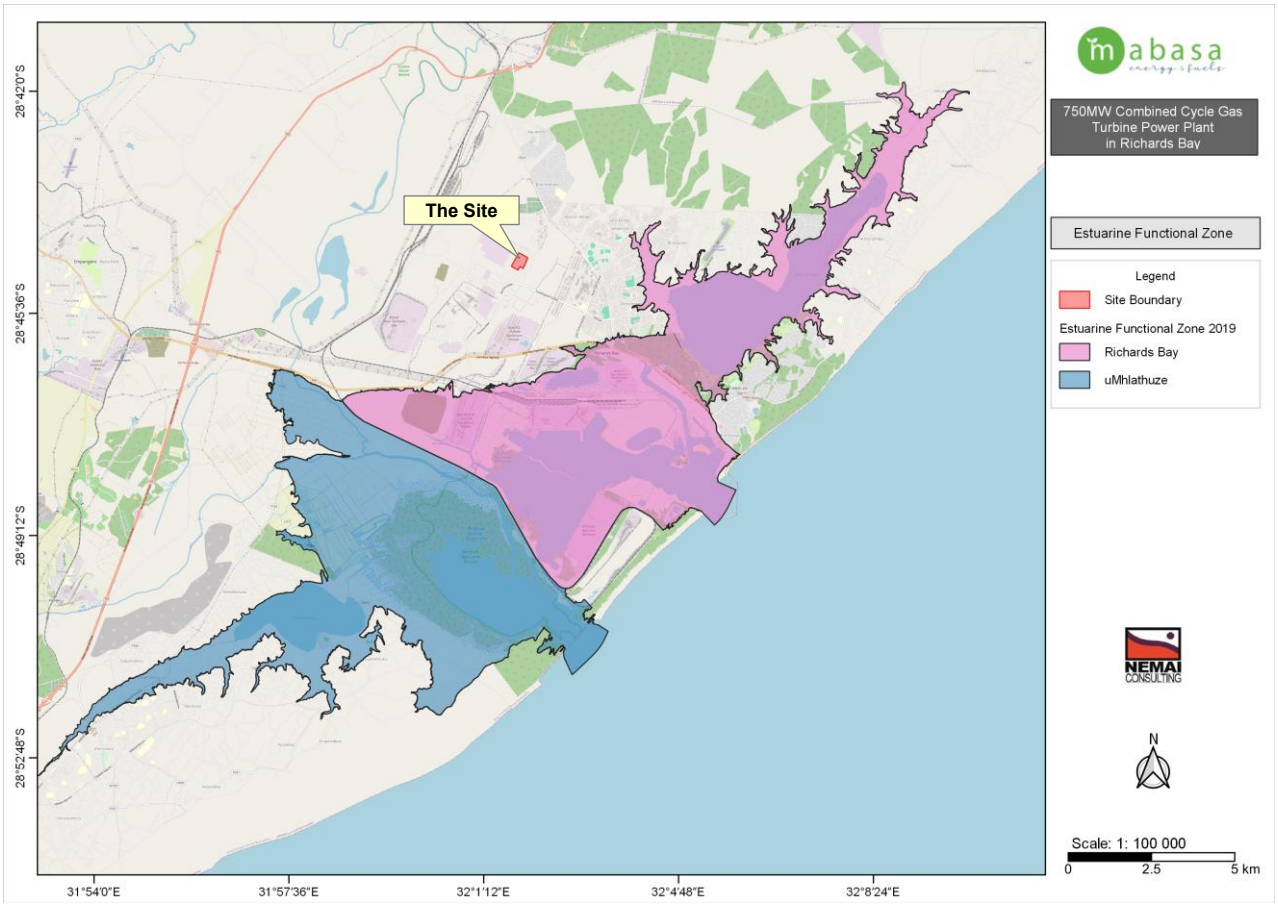


Figure 45: EFZs for Richards Bay Estuary and adjacent uMhlathuze Estuary

According to the National Biodiversity Assessment (NBA) 2018 (Van Niekerk *et al*., 2019), although highly modified from the original state as an estuarine lake, "…*Richards Bay (an estuarine embayment) and uMhlathuze Estuary (a permanently open estuary) are nationally important estuarine biodiversity areas, supporting globally important critical habitats (mangroves and eelgrass) and are important nursery areas supporting fisheries across the wider KZN coast*".

This statement is echoed in the Estuarine Management Plan (EstMP) (DEA, 2018), which indicates that despite extensive modification the uMhlathuze/Richards Bay estuaries "*remain unique and highly productive ecosystems that support complex food webs and functions as a vital spawning and nursery ground for a diverse range of marine and estuarine organisms*…". In addition, these two systems "*offer nearly the complete range of habitat types found in tidal reaches of estuaries, including intertidal and subtidal mudflats, sandbanks, mangroves and seagrass beds*…"'(DEA, 2018).

Numerous reports have highlighted the significance of Richards Bay Harbour as a functional estuarine ecosystem and that it makes a major contribution in this regard both in terms of KZN and Nationally. Richards Bay Harbour is also known to have the oldest area of mangroves in the country (Van Niekerk & Turpie, 2012).

According to Breetzke *et al.,* (2022), the ecological importance of the Richards Bay Estuary is highlighted by the following:

- Richards Bay is one of only three estuarine bays in the country and is consequently considered a rare estuarine type. It is a national priority estuary that requires protection in order to preserve SA's estuarine biodiversity.
- Despite its modified state, it supports a diversity of habitats, and therefore a rich diversity of estuarine and marine fauna and flora, including threatened or protected species.
- The endangered humpbacked dolphin regularly occurs within the port, and consideration must be given to the protection of this species, as well as its preferred habitat.
- It also provides important ecosystem services of high monetary and societal value.
- The Kabeljous Flats and the sandspit are a unique habitats that support a higher diversity of organisms relative to other areas of the port, and contributes significantly to the overall biodiversity and conservation importance of the estuary.
- Richards Bay is ranked third on a national level in terms of its importance to waterbird populations (previously supporting large numbers of birds, high numbers of migrant species, as well as species of conservation concern) and is also rated as a very important estuarine nursery area both in terms of protecting biodiversity and also sheltering commercially important fish and prawn species.
- It is an Endangered estuarine ecosystem type, meaning that it is at risk of losing vital aspects of its structure, function and composition. With a low level of ecosystem protection, i.e. limited to no area under formal protected area status, there little means to prevent such loss from occurring.
- It is designated an irreplaceable CBA and is also classified as a Freshwater Ecosystem Priority Areas (FEPA). inferring that any loss of natural features or living resources would mean an irreplaceable loss of critical biodiversity assets with national implications.

11.10 Terrestrial Biodiversity

The sub-sections that follow describe the terrestrial biodiversity features within the project area.

A Terrestrial Biodiversity Assessment (STS, 2026a) (contained in **Appendix E4**), Floral Assessment (STS, 2026b) (contained in **Appendix E5**), and Faunal Assessment (STS, 2026c) (contained in **Appendix E6**) were undertaken for the Project. Summaries of these specialist studies are provided in Sections 0 below.

11.10.1 Biomes and Vegetation Types

According to the spatial dataset from EKZNW (2018), the site predominantly falls within the Indian Ocean Coastal Belt Biome, with the western part of the site falling in a Wetland Biome (see Figure 46 below). The vegetation types encountered on the site include the Maputaland Wooded Grassland and Freshwater Wetlands: Subtropical Freshwater Wetlands (see Figure 47 below).

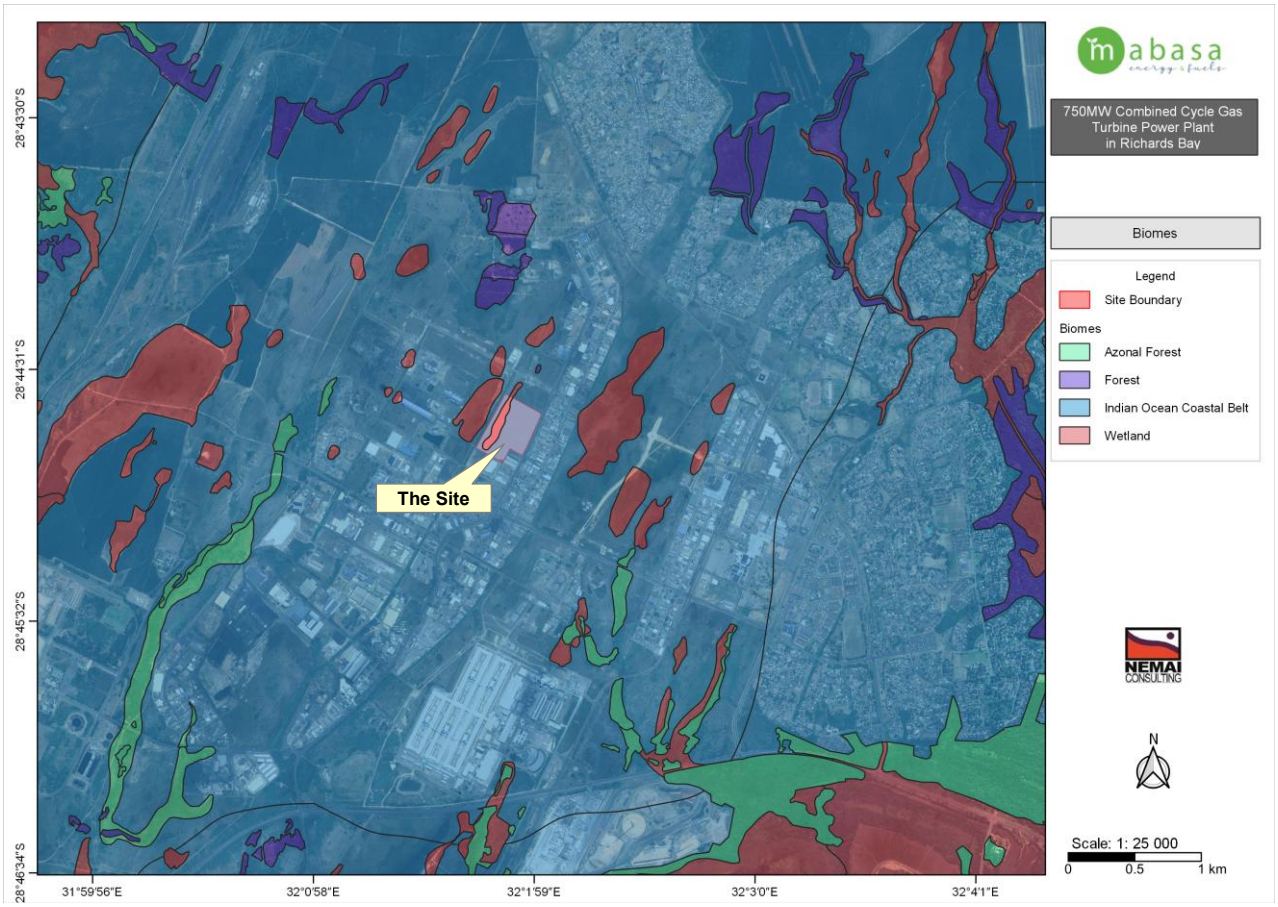


Figure 46: Biomes in relation to the project area (EKZNW, 2018)

A brief description of each vegetation type, according to Scott-Shaw & Escott (2011), follows:

- **Maputaland Wooded Grassland** –
  - Distribution: KZN Province and southern Mozambique: In SA from the Mozambique border near KwaNgwanase southwards to Sileza, Sibaya, Mseleni, Mbaz-wana, Sodwana Bay, Ozabeni, eastern and western shores of Lake St Lucia, KwaMbonambi and as far south as near Richards Bay. Altitude varies from about 20–120 m.
  - Vegetation and Landscape features: Generally flat landscape of the Maputaland coastal plain supporting coastal sandy grasslands rich in geoxylic suffrutices, dwarf shrubs, small trees and very rich herbaceous flora. Excluded from this unit are the many inter-dune depression wetlands and hygrophilous grasslands neighbouring the wooded grasslands.



Figure 47: Vegetation types in relation to the project area (EKZNW, 2018)

- **Freshwater Wetlands: Subtropical Freshwater Wetlands** –
  - Distribution: KZN, Mpumalanga, Gauteng, North-West, Limpopo and Eastern Cape Provinces as well as in Swaziland: Wetlands embedded within the Albany Thicket Biome, the Coastal Belt from Transkei as far as Maputaland as well as those of Lowveld and the Central Bushveld regions. Altitude ranging from 0–1 400 m.
  - Vegetation and Landscape features: Flat topography supporting low beds dominated by reeds, sedges and rushes, water logged meadows dominated by grasses. Found typically along edges of often seasonal pools in Aeolian depressions as well as fringing alluvial backwater pans or artificial dams.

According to EKZNW (2018), the conservation status of these vegetations types is as follows:

- Maputaland Wooded Grassland – Endangered; and
- Freshwater Wetlands: Subtropical Freshwater Wetlands – Vulnerable.

The project area in relation to the remaining extent of threatened ecosystems as per the Red List of Ecosystems (RLE) is shown in Figure 48 below.



Figure 48: Project area in relation to remaining extent of threatened ecosystems as per the RLE (SANBI, 2022a, 2022b as cited in STS, 2026a) and the associated protection level (NBA, 2018).

11.10.2 Protected Areas

According to EKZNW (2021), the following protected areas occur within a 10 km radius of the site (see Figure 49 below):

- Enseleni Nature Reserve – approximately 5.2 km to the north-west; and
- Richards Bay Nature Reserve – approximately 6.1 km to the south.

The site is located within a Priority Focus Area in terms of the National Protected Area Expansion Strategy (NPAES) (see Figure 49 below). However, the location of the proposed development within the RBIDZ, which is a designated Special Economic Zone (SEZ), needs to be taken into consideration in this regard.

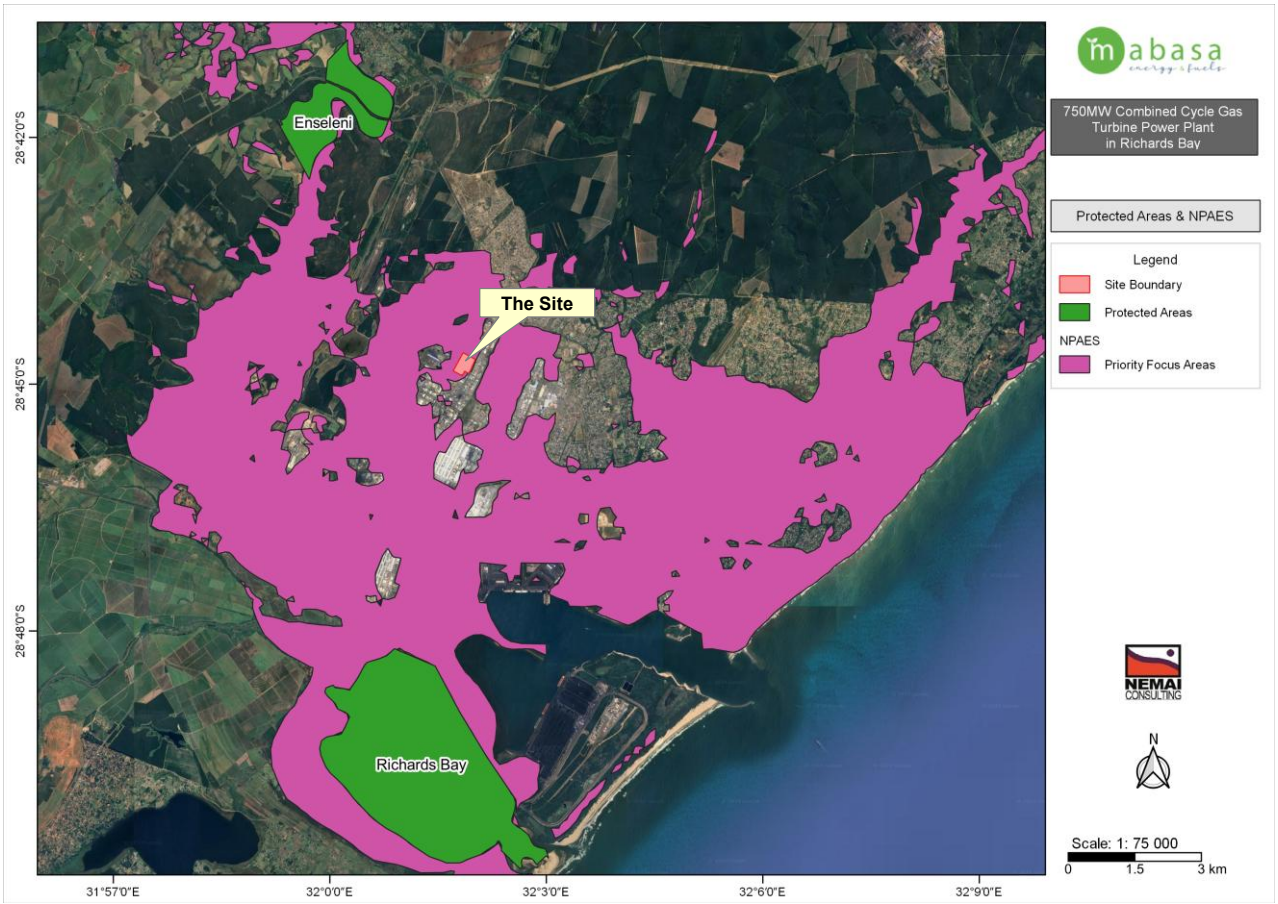


Figure 49: Protected areas in relation to the project area (EKZNW, 2021)

11.10.3 KZN Biodiversity Plan

According to EKZNW (2016a), the KZN BP provides a spatial representation of land and coastal marine area required to ensure the persistence and conservation of biodiversity within KZN, reflected as CBAs and Ecological Support Areas (ESAs).

The site encroaches into areas designated as CBA Irreplaceable in terms of the KZN BP (see Figure 50 below).

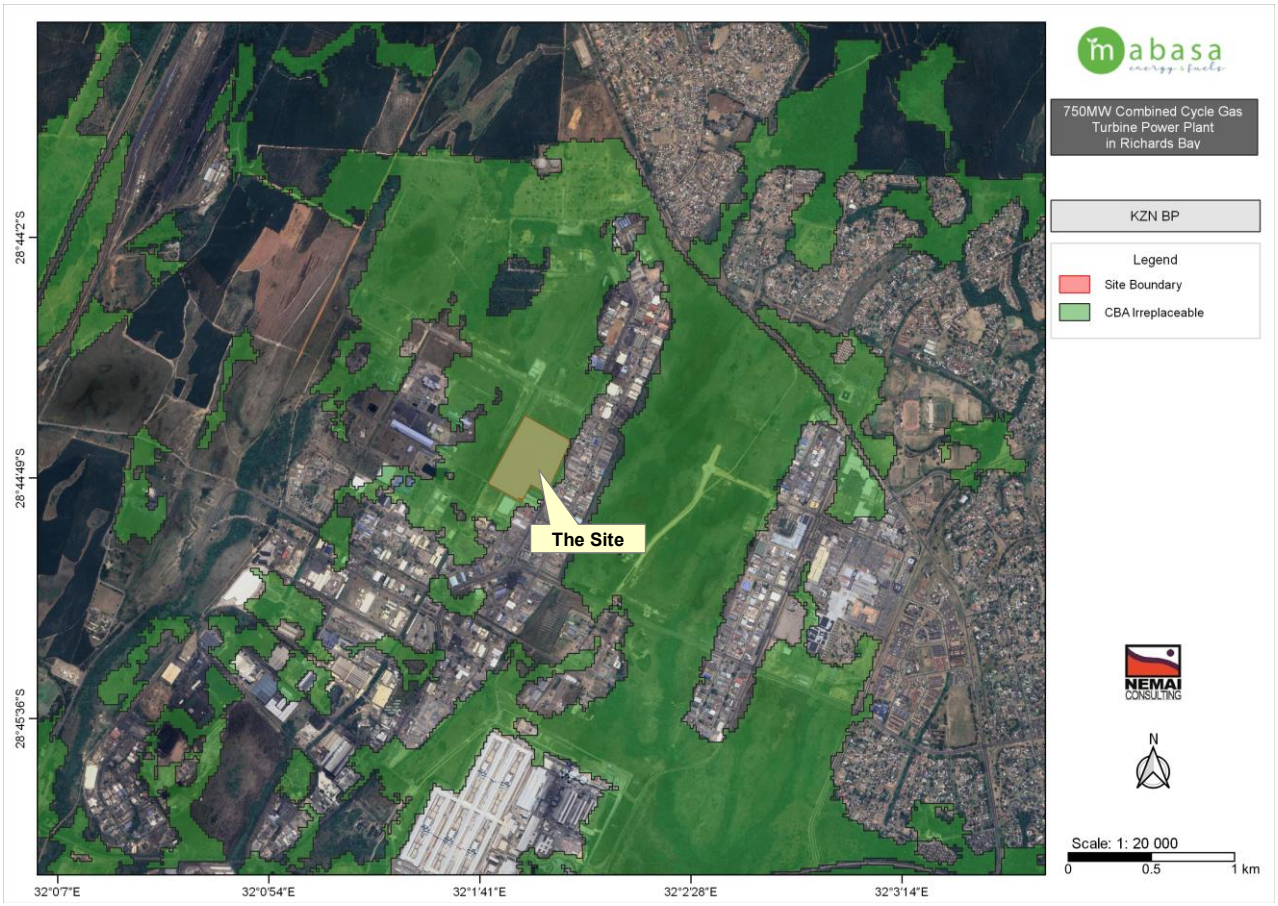


Figure 50: CBA Irreplaceable areas in relation to the project area (EKZNW, 2016b)

11.10.4 DFFE Screening Tool

11.10.4.1 Animal Species Theme

The sensitivity of the Animal Species Theme in relation to the site, as determined by the Screening Tool, is presented in Table 29 below. The findings of the SSV by the Terrestrial Ecologist are also captured in this table.

Table 29: Animal Species Theme Sensitivity and SSV Findings (CR = Critically Endangered, EN = Endangered and VU = Vulnerable)

Theme	Sensitivity - Screening Tool	SSV
Animal Species	The entire study area occurs within a **high sensitivity** (see Figure 51 below). The triggered species include: **High (i.e., recent occurrence records for threatened and/or rare endemic species are included in the high sensitivity level):** ▪ *Circaetus fasciolatus* (Southern Banded Snake Eagle) (critically endangered (CR)); ▪ *Circus ranivorus* (African Marsh Harrier) (endangered (EN)); ▪ *Geokichla guttata* (Spotted Ground Thrush) (EN); ▪ *Podica senegalensis* (African Finfoot) (vulnerable (VU));	During the site visit, it was determined that large portions of the site had previously been transformed or degraded. However, natural (untransformed) vegetation was still present. An Animal Species Specialist Assessment was undertaken and the findings are provided in Section 0.

Theme	Sensitivity - Screening Tool	SSV
	▪ *Polemaetus bellicosus* (Martial Eagle) (EN); and ▪ *Stephanoaetus coronatus* (Crowned Eagle) (VU). **Medium (suspected suitable habitat for CR, EN or VU species):** ▪ *Arytropteris basalis* (Flat-necked Shieldback) (VU); ▪ *Balearica regulorum* (Grey Crowned Crane) (EN); ▪ *Crocodylus niloticus* (Nile Crocodile) (VU); ▪ *Halcyon senegaloides* (Mangrove kingfisher) (EN); ▪ *Hyperolius pickersgilli* (Pickersgill's Reed Frog) (EN); ▪ *Lycaon pictus* (African Wild Dog) (EN); ▪ *Nettapus auratus* (African Pygmy Goose) (VU); ▪ *Pelusios rhodesianus* (Variable Hinged Terrapin) (VU); ▪ *Pomatonota dregii* (East Coast Katydid) (VU); ▪ *Terathopius ecaudatus* (Bateleur) (EN); and ▪ Sensitive species 8 (VU).	



Figure 51: Map of relative Animal Species Theme sensitivity (Screening Tool)

11.10.4.2 Plant Species Theme

The sensitivity of the Plant Species Theme in relation to the site, as determined by the Screening Tool, is presented in Table 30 below. The findings of the SSV by the Terrestrial Ecologist are also captured in this table.

Table 30: Plant Species Theme Sensitivity and SSV Findings (CR = Critically Endangered, EN = Endangered and VU = Vulnerable)

Theme	Sensitivity - Screening Tool	SSV
Plant Species	The northern and central sections of project area occur within a **medium sensitivity class** (see Figure 52 below). A small section in the south-eastern section of the study area is in a **low sensitivity class**. Triggered species include: ▪ *Cassipourea g*ummiflua var. *verticillata* (VU); ▪ *Emplectanthus cordatus* (VU); ▪ *Fimbristylis aphylla* (VU); ▪ *Freesia laxa* subsp. *azurea* (VU); ▪ Nidorella tongensis (EN); ▪ *Oxygonum dregeanum* subsp. s*treyi* (EN); ▪ *Pachycarpus concolor* subsp. *arenicola* (VU); ▪ Pavonia dregei (VU); ▪ *Senecio ngoyanus* (VU); ▪ Sensitive species 89 (VU); ▪ Sensitive species 191 (VU); ▪ Sensitive species 649 (VU); ▪ Sensitive species 1252 (VU); and ▪ *Thesium polygaloides* (VU).	During the initial site visit it was determined that most of the site is in a degraded state. However, natural (untransformed) vegetation was present. A Plant Species Specialist Assessment was undertaken and the findings are provided in Section 0.

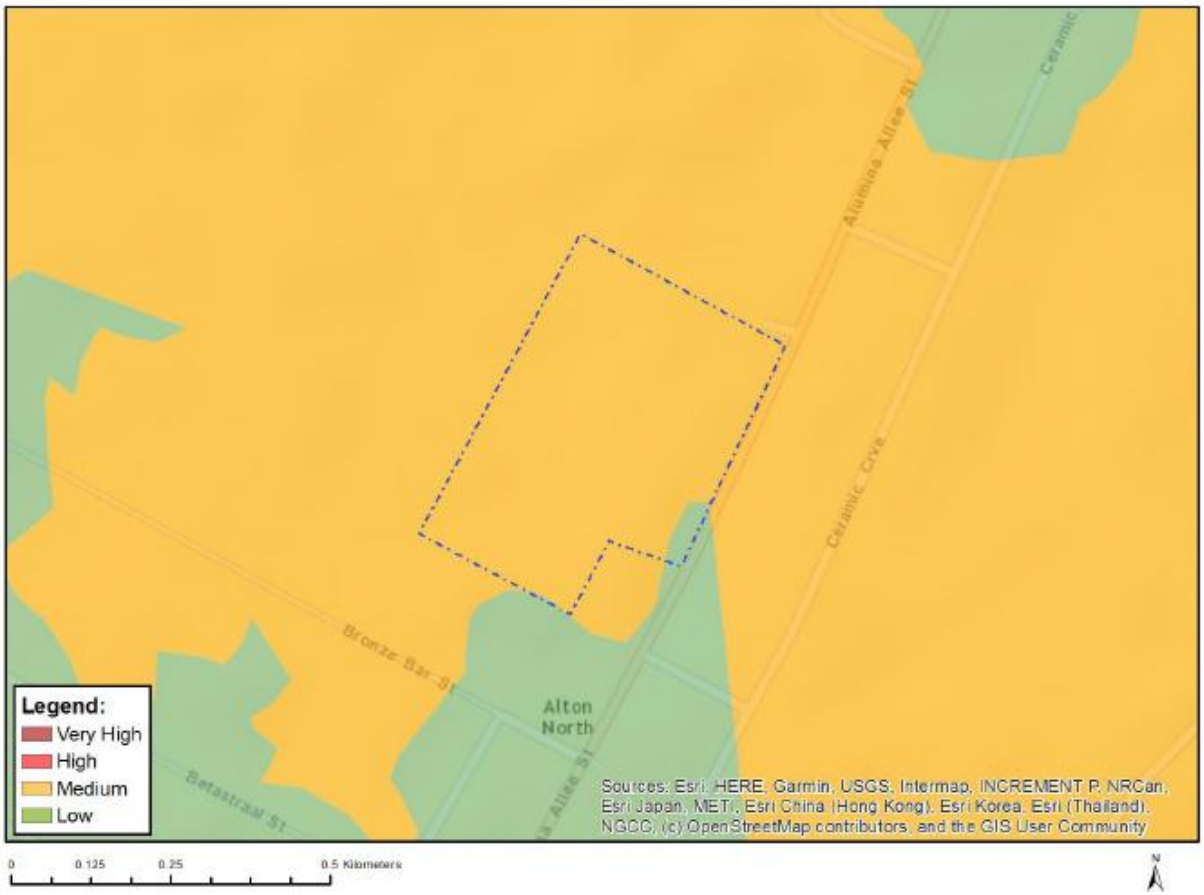


Figure 52: Map of relative Plant Species Theme sensitivity (Screening Tool)

11.10.4.3 Terrestrial Biodiversity Theme

The sensitivity of the Terrestrial Biodiversity Theme in relation to the site, as determined by the Screening Tool, is presented in Table 31 below. The findings of the SSV by the Terrestrial Ecologist are also captured in this table.

Table 31: Terrestrial Biodiversity Theme Sensitivity and SSV Findings

Theme	Sensitivity - Screening Tool	SSV
Terrestrial Biodiversity	The entire extent of project area is within a very high sensitivity area according to the Terrestrial Biodiversity Theme outcome of the Screening Tool (see Figure 53 below). Triggered biodiversity features include the EN Maputaland Wooded Grassland threatened ecosystem, CBA: Irreplaceable, as well as the Priority Focus Area in terms of the NPAES.	During the initial site visit it was determined that several historic and current pressures on the vegetation within the study area were present. However, some sections of seemingly intact vegetation remained. A Terrestrial Biodiversity Assessment was undertaken and the findings are provided in Section 0.



Figure 53: Map of relative Terrestrial Biodiversity Theme sensitivity (Screening Tool)

11.11 Socio-Economic Environment

The following information was extracted from the Socio-Economic Impact Assessment (Urban-Econ, 2026). Refer to Section 12.12 below for a synopsis of the study. The specialist report is contained in **Appendix E11**.

11.11.1 Social Landscape

This subsection analyses the demographics in the primary impact area and the secondary impact area. The goal is to gain insights into the population composition in the affected region, providing a more accurate assessment of how various groups may be impacted by the proposed development.

11.11.1.1 Population and Households

The table below summarises key population and household statistics for Richards Bay, the CoU and KCDM, offering a comparative view of household composition and overall population distribution across the region.

Table 32: Demographic Statistics for Study Area, 2024 (Urban-Econ, 2026)

Category	Richards Bay	CoU	KCDM
Population	77 205	412 075	1 021 344
Number of Households	23 346	100 441	205 739
Average Household size	3.3	4.1	5.0
Males	47.9%	50.8%	47.3%
Females	52.1%	49.2%	52.7%

Source: Stats SA Census 2022

As shown in the table above, the Richards Bay area accommodates 77 205 residents and 23 346 households. In contrast, the CoU and KCDM are housing 412 075 and 1 021 344 residents respectively. The population of Richards Bay accounts for approximately 18.7% of the total population of the CoU and approximately 7.6% of the total population of the KCDM. This highlights Richards Bay's importance within the local and district municipalities, indicating its role as a substantial urban centre in the region. Given this strategic urban significance, the proposed Project is well-positioned to leverage local capacity and contribute meaningfully to regional socio-economic development.

11.11.1.2 Age

The table below illustrates the age distribution in the study area.

Table 33: Age Distribution in Impact Area, 2024 (Urban-Econ, 2026)

Age Group	Description	Richards Bay	CoU	KCDM
Youth	**0 – 14 years**	20.4%	25.5%	29.5%
Working Age	**15 – 64 years**	73.1%	69.8%	65.0%
Elderly	**65+ years**	6.2%	4.6%	5.5%

Source: Quantec Standardised Regional Data, 2026

The data reveals that most of the population in the study area falls within the working age group. The big percentage of the working age population illustrates the availability of labour for the proposed development. The remaining population consists of individuals outside the working-age range, relying on the working population for economic support.

Richards Bay contributes approximately 27.1% to the economically active population of the CoU and about 14.7% of the economically active population of the KCDM. This highlights its importance as an economic centre within the municipality and the district. There is a large local labour pool that can support the proposed Project. Priority should be given to this area for employment opportunities, particularly during construction, when the working-age population is likely to benefit from increased job creation.

11.11.1.3 Skills Level

Skill levels often correlate directly with and influence the workforce's capacity to engage in various economic activities. The following table shows the skills levels available in the area of impact.

Table 34: Skills Levels for the KCDM and the CoU, 2024 (Urban-Econ, 2026)

Category	CoU	KCDM
Low Skilled	25.7%	29.4%
Semi-skilled	44.7%	43.2%
Skilled	29.4%	27.4%

Source: Quantec Standardised Regional Data, 2026

The majority of the population in both the district and local municipalities is composed of semi-skilled individuals with 43.2% in the district and 44.7% at the local municipality level. There is also a substantial presence of low-skilled workers which could indicate a large labour pool, especially for construction jobs, which typically require labour that does not need high skill levels.

11.11.1.4 Employment

The table below summarises the proportion of individuals who are employed, unemployed, or not economically active across Richards Bay, CoU and KCDM.

Table 35: Employment Status of Population Ages 15-64 in Study Area, 2024 (Urban-Econ, 2026)

Category	CoU	KCDM
Unemployment Rate	29.1%	32.9%
Labour Force Participation Rate	60.3%	45.9%
Labour Absorption Rate	42.7%	30.8%

Source: Quantec Standardised Regional Data, 2026

The labour market indicators suggest that the CoU is performing relatively better than the broader district, although unemployment remains a significant concern in both areas. The unemployment rate of 29.1% in the CoU indicates that a significant proportion of the labour force remains without work, pointing to ongoing pressure within the local economy to generate sufficient employment opportunities. This suggests that, despite the economic importance of the area, a large number of individuals who are willing and available to work are still unable to access employment.

At the same time, the labour force participation rate of 60.3% shows that a relatively large share of the working-age population is economically active, meaning that many individuals are either employed or actively seeking employment. The labour absorption rate of 42.7% indicates that just under half of the working-age population is employed. This highlights that a considerable share of the working-age population remains outside of employment. Taken together, these indicators point to the need for continued economic development and employment creation initiatives that can improve labour market outcomes and broaden access to income-generating opportunities within the CoU.

11.11.1.5 Household Income

The table below highlights the varying degrees of income inequality and economic vulnerability present in the region.

Table 36: Income Levels of Study Area, 2024 (Urban-Econ, 2026)

Category	Income Level	Richards Bay	CoU	KCDM
No Income	No Income	11.9%	15.2%	13.5%
Very Low Income	R1-R4 800	1.4%	4.4%	4.8%
	R4 801-R9 600	2.7%	8.0%	9.2%
	R9 601-R19 200	5.6%	13.7%	20.2%
Low Income	R19 201-R38 400	6.6%	15.5%	21.1%
	R38 401-R76 800	9.0%	11.9%	11.5%
	R76 801-R153 600	13.9%	11.1%	8.0%
Middle Income	R153 601-R307 200	20.9%	10.1%	6.0%
	R307 201-R614 400	18.8%	7.2%	4.1%
	R614 401-R1 228 800	7.0%	2.2%	1.2%
High Income	R1 228 801-R2 457 600	1.2%	0.5%	0.3%

Category	Income Level	Richards Bay	CoU	KCDM
	R2 457 601+	0.8%	0.3%	0.2%

Source: Quantec Standardised Regional Data, 2026

Richards Bay has a higher concentration of its population in the middle-income brackets indicating greater wealth and economic stability. In contrast, the CoU and KCDM show higher percentages in the lower-income brackets with the CoU having the highest percentage in the lowest income categories.

This suggests that while Richards Bay enjoys relative affluence, there is a need for economic upliftment and support in the broader municipality and district to address income inequalities. The income levels highlight a need for more ways for people to earn money and earn a satisfactory living monthly income.

11.11.1.6 Access to Basic Services

Access to basic services such as water and energy is a key indicator of living standards and overall well-being in the study area. Understanding the provision and quality of these services helps to contextualise the socio-economic environment in which communities live and informs potential project impacts and opportunities for local development. The following table gives an indication of the access to basic services in the study area.

Table 37: Access to Basic Services in the Study Area, 2024 (Urban-Econ, 2026)

	Richards Bay	CoU	KCDM
WATER			
Inside dwelling	85.6%	54.2%	36.3%
Inside yard	9.1%	38.1%	38.5%
Community stand	3.9%	7.2%	22.6%
None	1.4%	0.5%	2.6%
ENERGY			
Electricity	96.2%	99.2%	97.6%
Candles	3.0%	0.5%	1.8%
Gas	0.2%	0.1%	0.2%
Paraffin	0.1%	0.0%	0.1%
Solar	0.4%	0.0%	0.0%
None	0.2%	0.1%	0.2%

Source: Quantec Standardised Regional Data, 2026

The baseline service profile indicates that Richards Bay and CoU are characterised by relatively strong *access* to core municipal services (notably water and electricity), reflecting the area's urbanised nature. However, access does not necessarily equate to reliable service performance. Available evidence suggests that infrastructure is under considerable strain, potentially due to

inadequate maintenance and delayed upgrades, with recurring failures and periodic disruptions to water and electricity supply reported (eNCA, 2026; Independent Online, 2026, as cited in Urban-Econ, 2026).

11.11.2 Economic Landscape

The fundamental activities that shape an economy involve the development, distribution and consumption of goods and services. The assessment of the value of goods and services produced within a specific region, industry, or sector is determined through the metric of gross value added (GVA). It is calculated as the difference between output and intermediate consumption. The table below highlights the municipal contributions to GVA.

Table 38: Municipal Contributions to the Provincial GVA, 2024 (Urban-Econ, 2026)

	Contribution to Provincial GVA	Contribution to District GVA
KCDM	8.5%	
CoU	6.0%	71.1%

Source: Quantec Standardised Regional Data, 2026

KCDM contributes 8.5% to the provincial GVA, with CoU contributing 6.0%. Notably, CoU accounts for 71.1% of the District GVA, highlighting its critical role in the KCDM's economy.

Table 39: Contribution to GVA by Sector, 2024 (Urban-Econ, 2026)

Sector	CoU	KCDM
Primary sector	11.0%	16.8%
Secondary sector	46.8%	40.5%
Tertiary sector	42.2%	42.7%

Source: Quantec Standardised Regional Data, 2026

While KZN's economy is predominantly driven by the tertiary sector, KCDM and CoU show a more balanced distribution across secondary and tertiary sectors. The table below shows the per industry contributions to GVA in CoU and KCDM.

Table 40: Per industry GVA Contributions to CoU and KCDM economies, 2024 (Urban-Econ, 2026)

Economic Industry	CoU	KCDM
Agriculture	4.2%	10.7%
Mining	6.8%	6.1%
Manufacturing	40.7%	34.4%
Electricity and water	2.6%	2.5%
Construction	3.5%	3.6%
Wholesale and retail trade	8.5%	8.3%

Economic Industry	CoU	KCDM
Transport services	11.4%	10.1%
Financial services	11.4%	10.9%
General government services	4.3%	5.2%
Community services	6.6%	8.1%

Source: Quantec Standardised Regional Data, 2026

The GVA contributions across economic sectors in CoU and KCDM highlight the dominance of manufacturing, transport and financial services, with manufacturing contributing significantly at 40.7% and 34.4%, respectively, in these regions. Agriculture is more prominent in KCDM, contributing 10.7% compared to 4.2% in CoU, while sectors such as construction, wholesale and retail and electricity and water maintain comparable contributions across both areas.

The socio-economic context demonstrates that Richards Bay functions as a key economic hub within the region, playing a vital role in shaping broader socio-economic dynamics. Despite its strategic importance, challenges such as high youth unemployment and low household income levels persist within the district municipality.

11.11.3 Sensitive Receptors

Table 41 below lists the land uses and sensitive receptors in Richards Bay from a socio-economic perspective, describing each area in relation to the project location.

Table 41: Sensitive receptors from a socio-economic perspective (Urban-Econ, 2026)

Land use / Sensitive receptor	Description and Sensitivity
Alton	While the Alton area is not a residential zone, the presence of numerous businesses means that the construction and operational impacts of the proposed 750MW CCPP may have an impact on this area.
RBIDZ	The construction and operations of the proposed development may have an impact on the operations of the RBIDZ due to it being located in the RBIDZ.
Formal housing 1. Arboretum 2. Brackenham 3. Wild En Weide 4. Empangeni 5. Empembeni 6. Aquadene 7. Birdswood 8. Veld En Vlei 9. Meer En See 10. Richards Bay 11. Ntshingimpisi	Although the infrastructure associated with the project does not affect residential areas directly, nearby remain relevant in the context of indirect socio-economic and environmental impacts. These areas are not expected to experience some disruption. On the other hand, it is anticipated that labour for the project will likely be sourced not only from these suburban areas but also from nearby higher-density settlements such as Empangeni and surrounding township areas. These communities represent an important component of the available labour pool and may also benefit from economic spinoffs associated with the project, including enterprise development and skills training.
Richards Bay Central Business District (CBD)	The CBD may be sensitive to air quality, traffic congestion and any disruptions affecting businesses or public services. However, due to its distance from the proposed site low impacts are expected.
Other Public Amenities: 1. Richards Bay Public Library 2. Richards Bay Clinic 3. Melomed Richards Bay Private Hospital	While the project infrastructure does not directly traverse these facilities, their relevance lies in their role as sensitive receptors, particularly concerning changes in air quality and regional service delivery. However, given the distance between these public amenities and the core project footprint, direct impacts are expected to be minimal. Cumulative or indirect effects may affect the functioning of some services, but this is likely to be limited and minimal.

Land use / Sensitive receptor	Description and Sensitivity
4. Netcare The Bay Hospital 5. Mandlanzini Sports Field	
Port of Richards Bay	The port may benefit from the proposed developments' energy supply and industrial synergies. As more power is generated, the port may benefit from increased industrialisation. On the other hand, the port may be sensitive to traffic and emissions. There may be need to consider emissions management near port workers and operations. However, considering the already industrial nature of the port activities, minimal direct impacts are anticipated.
John Ross Highway	It is a major transport artery serving Richards Bay and the surrounding areas. It is likely to be sensitive to increased traffic volumes during the construction and operation phases of the project. In particular, logistics activities and the delivery of construction materials for the proposed 750MW CCPP may place additional pressure on this route.
Transnet Freight Rail network (feeds into the harbour)	The rail line plays a critical role in supporting bulk freight and logistics operations, particularly servicing the Port of Richards Bay and surrounding industrial areas. Given its strategic function, the rail infrastructure is moderately sensitive to increased congestion or disruptions that may arise during the construction and operational phases of the proposed development. The transportation of equipment and materials related to the proposed 750MW CCPP may influence rail operations. Therefore, coordinated planning and mitigation measures are required to ensure the safe co-existence of the power infrastructure and existing rail operations.
ZET gas distribution supply take-off point (Not yet functional, but it has been proposed)	The gas distribution point is a vital component of the energy supply system for the proposed 750MW CCPP. It will serve as the interface between the incoming gas and the transmission infrastructure. The proposed CCPP development will place increased operational demand on the distribution point, requiring enhancements to capacity, safety monitoring and pressure regulation systems.

11.12 Air Quality

The following information was extracted from the Air Quality SSV (uMoya-NILU, 2024) (contained in the Scoping Report) and the Air Quality Impact Assessment (uMoya-NILU, 2026). Refer to Section 12.5 below for a synopsis of the Air Quality Impact Assessment. The specialist report is contained in **Appendix E2**.

11.12.1 Emission Sources

Richards Bay is one of the fastest developing areas in SA with the PoRB and the RBIDZ being a major attraction for industrial and commercial development. The PoRB houses one of the largest coal export terminals in the world. Activities at the Port, including shipping and coal handling, are sources of air pollution. A number of major and smaller industries located in Richards Bay all emit a range of air pollutants into the atmosphere.

Other local air pollution sources include emissions from vehicles exhaust, dust from mining activities, forest and sugarcane burning and dust from coal stockpiles. Collectively these sources of air pollutants contribute to the ambient concentrations experienced in Richards Bay. In addition, long-range transport of air pollutants to the east coast from the industrialised Highveld and elsewhere contribute to the local air which has an additive effect.

11.12.2 Ambient Air Quality

11.12.2.1 Long-Term Trends

The Richards Bay Clean Air Association (RBCAA, http://www.rbcaa.org.za/) has undertaken ambient air quality monitoring in the area since 2004, measuring SO_2 and PM_{10}. Okello *et al*. (2018) (as cited in uMoya-NILU, 2026) used the RBCAA data to describe air quality in the Richards Bay area over the period 2004 to 2017. Findings from this comprehensive analysis are highlighted here.

PM_{10} monitoring data indicates a downward trend at 4 stations (Brakenham, CBD, Esikhaleni and Felixton) (see Figure 54 below). Mtunzini and St. Lucia, the reference sites, had upward trends. The CBD and Brakenham have higher PM_{10} values compared to the other stations. All measurements were within the stipulated NAAQS annual average limit of 50 µg/m^3.

Esikhaleni is a highly populated area with mostly low-income households and fewer industries compared to areas around the CBD. The source of PM_{10} are different and are likely to be indoor compared to outdoor. St. Lucia and Mtunzini were the reference site with PM_{10} levels averaging at 20.8 µg/m^3 and 22.3 µg/m^3 respectively. This is deemed to be a good indication of the background PM_{10} concentration of the whole study area as both sites are relatively unaffected by local sources. The background in both cases is above the World Health Organization (WHO) guideline value indicating the potential contribution of other sources such as pollen and sea salts.

SO_2 measurements in all seven monitoring stations where data was available was within the NAAQS of 50 µg/m^3 (see Figure 55 below). Downward trends were observed in Arboretum, Brakenham, CBD and Felixton. Harbour West had no observable trend. Esikhaleni showed an upward trend although with ambient concentrations well below the annual limit value. Scorpio had the least favourable SO_2 trends attributable to their close vicinity to industry.

Data taken over the long term (1997 to 2017) for SO_2 indicate a slightly upward trend. From 2013 to 2017 however, a significant downward trend is observed. The Scorpio and Harbour West Stations have consistently been above the 20-year average. This can be attributed mostly to emissions from the surrounding industry. The CBD had SO_2 annual average ambient concentration just below the 20-year regional annual average. Measurement from residential areas such as Arboretum, Mthunzini and Esikhaleni showed low concentrations of SO_2.

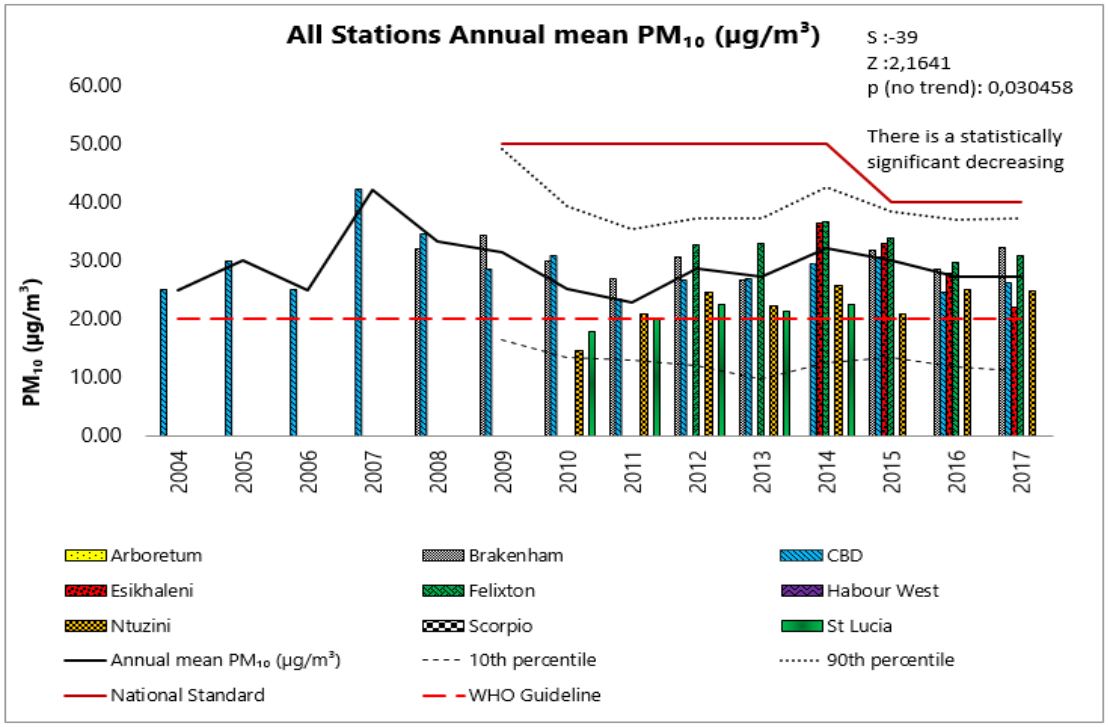


Figure 54: Annual average PM_{10} monitored concentrations (Okello *et al.*, 2018 as cited in uMoya-NILU, 2026)

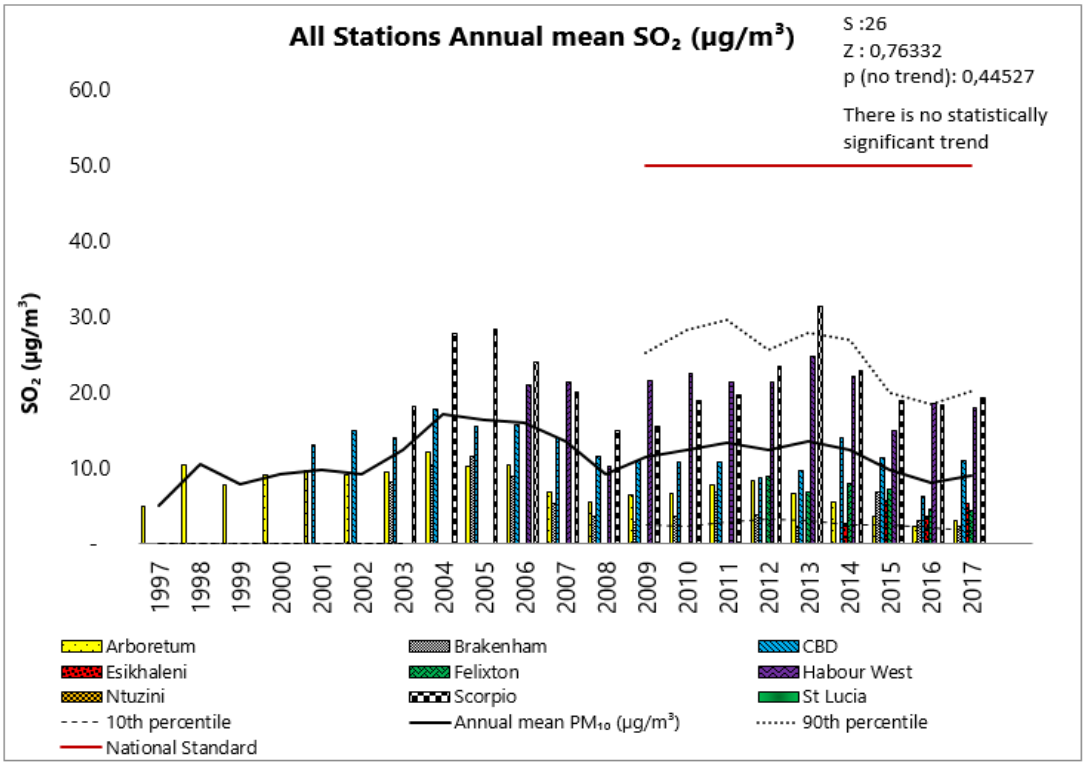


Figure 55: Annual average SO_2 monitored concentrations (Okello *et al.*, 2018 as cited in uMoya-NILU, 2026)

11.12.2.1 Ambient Monitoring Data from 2021-2025

Ambient air quality monitoring is undertaken in Richards Bay by the CoU and the RBCAA. Ambient air quality is generally influenced by a number of air pollution sources. Some of the local air pollution sources within the study area include emissions from industrial activities, vehicles exhaust, dust from ore storage and handling, forest burning and coal dust from coal stockpiles. Numerous complaints have been reported between 2021-2023.

The CoU data capture percentages were generally found to not meet SANAS requirements for statistical purposes. This data was not used. Rather the baseline ambient air quality conditions for this assessment were evaluated using available data from selected RBCAA air quality monitoring stations (AQMS) in the area. Ambient SO_2 data was downloaded from the RBCAA website (https://rbcaa.org.za/) for the Harbour West AQMS for 2021 to 2025 and PM_{10} and $PM_{2.5}$ at the Brakenham and CBD AQMS for 2021 to 2024. The Harbour West AQMS is located close to the proposed project site, the CBD AQMS is approximately 5 km north of the proposed project site and the Brackenham AQMS is approximately 6.6 km north of the study site.

Data capture at the respective AQMS for the assessment periods is relatively high (see Table 42 below). It is considered representative for the baseline air quality conditions in the study area.

Table 42: Data Capture for data obtained from respective RBCAA AQMS (uMoya-NILU, 2026)

Pollutant	Data Capture (%)	Station
SO_2	97	Harbour
PM_{10}	86	CBD
$PM_{2.5}$	80	Brakenham

Sulphur dioxide (SO_2)

Ambient SO_2 concentrations may be attributed mostly to local industrial sources. The ambient SO_2 concentrations are relatively low and there is general compliance with the NAAQS. Despite this, exceedances of the 1-hour and 24-hour standard have been recorded.

The annual average SO_2 concentrations at the Harbour West AQMS were low and well below the SO_2 annual standard of 19 ppb in all years (see Table 43 below).

Table 43: Annual average SO_2 concentrations at the Harbour West AQMS in ppb (uMoya-NILU, 2026)

Year	2021	2022	2023	2024	2025
Concentration	12.0	10.7	7.1	6.1	6.3

During the 5-year period, hourly average SO_2 concentrations at the Harbour West AQMS ranged between 0.003 ppb and 2 357.2 ppb (see Figure 56 below), whereas daily average SO_2 concentrations ranged between 0.07 and 805.8 ppb (see Figure 57 below). There were 53

exceedances of the hourly standard (134 ppb) in 2021, 66 exceedances in 2022, 3 exceedances in 2023 and 1 exceedance in 2024. There is no WHO ambient air quality guideline for 1-hr SO_2.

There were 4 exceedances of the daily standard (48 ppb) in 2021 and 10 exceedances in 2022 (see Table 44 below). In terms of the South African NAAQS, 88 exceedances of the hourly limit are permitted, whereas 4 exceedances of daily limit are permitted within a calendar year. The more stringent WHO 24-hour guideline of 15.3 ppb was exceeded on 242 days in the 5-year period (see Table 44 below).

Therefore, SO_2 levels measured at the Harbour West AQMS between 2021-2025 exceeded the daily air quality standard in 2021 and 2022. No exceedances of the SO_2 annual standard (19 ppb) were observed during the monitoring assessment period

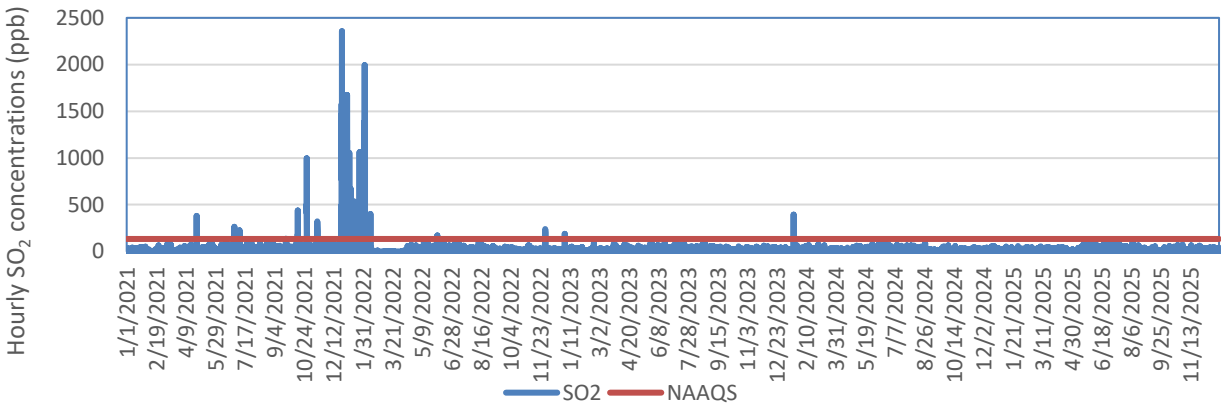


Figure 56: Hourly average SO_2 concentrations (ppb) measured at the Harbour West AQMS (uMoya-NILU, 2026)

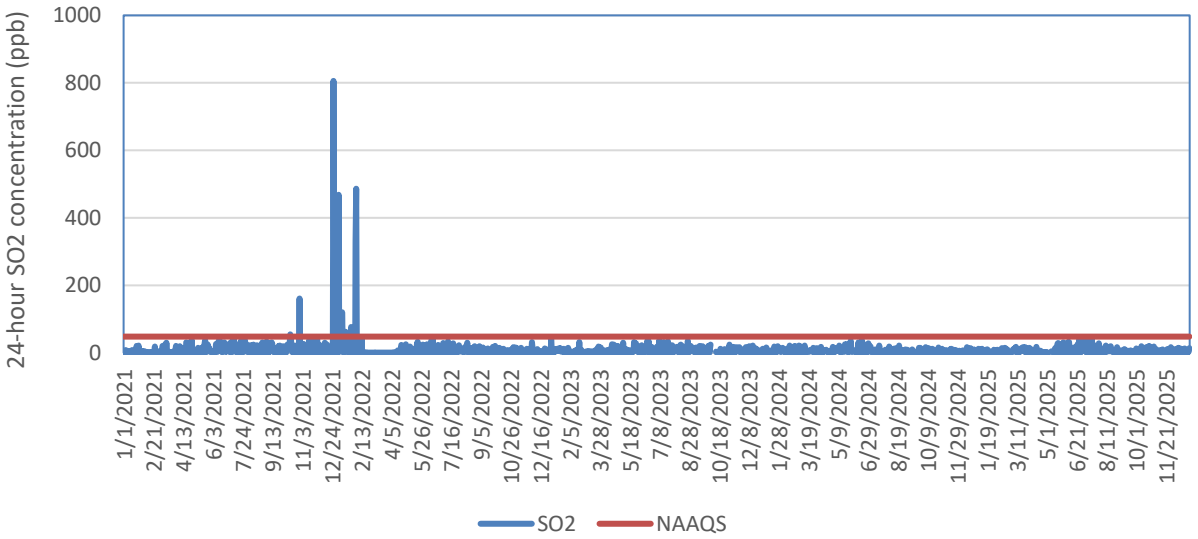


Figure 57: Daily average SO_2 concentrations (ppb) measured at the Harbour West AQMS (uMoya-NILU, 2026)

Table 44: Number of exceedances of daily standard/guidelines for SO_2 (uMoya-NILU, 2026)

	2021	2022	2023	2024	2025
NAAQS	4	10	0	0	0
WHO	76	49	47	31	39

Particulate matter (PM_{10})

PM_{10} is a regional pollutant with a regional background concentration in Richards Bay of more than 20 µg/m^3 (Okello *et al*, 2018 as cited in uMoya-NILU, 2026). Ambient PM_{10} concentrations may be attributed mostly to the high regional background with some contribution from local sources.

Annual average PM_{10} concentrations were below the annual standard of 40 µg/m^3 (see Table 45 below). The ambient PM_{10} concentrations are relatively low and there is general compliance with the NAAQS. The increase from 2022 to 2023, and from 2023 to 2024 is noteworthy. A continued increasing trend cannot be assessed without data in 2025. In 2023 and 2024 the annual average PM_{10} concentration was above the WHO annual ambient air quality guideline of 15 µg/m³.

Exceedances of the 24-hour standard have been recorded. Daily average PM_{10} concentrations at the CBD AQMS from January 2021 to October 2024 ranged between 1.99 µg/m^3 and 123 µg/m^3, with an average of 17 µg/m^3. In 2024 five exceedances of the PM_{10} daily standard (75 µg/m^3) were recorded (see Figure 58 below). In terms of the South African NAAQS, 4 exceedances of the PM_{10} 24-hour standard are permitted within a calendar year. Therefore, PM_{10} concentrations measured in 2024 at the CBD AQMS exceeded the NAAQS, otherwise they complied. The stricter WHO 24-hour ambient air quality guideline of 45 µg/m^3 was exceeded on 7 days in 2023 and on 30 days in 2024.

Table 45: Annual average PM_{10} concentrations at the CBD AQMS in µg/m^3 (uMoya-NILU, 2026)

Year	2021	2022	2023	2024
Concentration	12.5	10.5	18.6	26.4

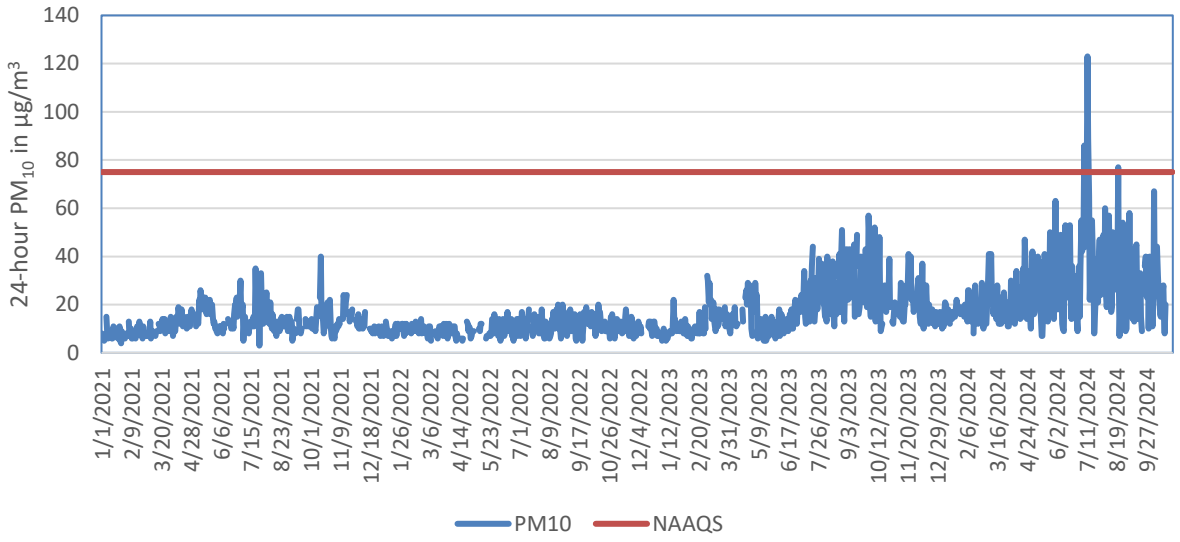


Figure 58: Daily average PM_{10} concentrations (µg/m³) measured at the CBD AQMS (uMoya-NILU, 2026)

Particulate matter ($PM_{2.5}$)

Annual average $PM_{2.5}$ concentrations were below the standard of 20 µg/m³ (see Table 46 below). The ambient $PM_{2.5}$ concentrations are relatively low and there is general compliance with the NAAQS. The stricter WHO annual ambient air quality guideline of 5 µg/m³ was exceeded in all years.

Daily average $PM_{2.5}$ concentrations at the Brackenham AQMS range between 2 µg/m³ to 67 µg/m³, with an average of 13.0 µg/m³. A total of 8 exceedances of the $PM_{2.5}$ daily standard (i.e. 40 µg/m³) were observed during the 2021 to 2024 period, one each in 2022 and 2023, and six in 2024 (see Figure 59below). In terms of the South African NAAQS, 4 exceedances of the $PM_{2.5}$ 24-hour standard are permitted within a calendar year. $PM_{2.5}$ concentrations measured at the Brackenham AQMS did not comply with the NAAQS in 2024. In the assessment period the stricter WHO 24-hour ambient air quality guideline of 15 µg/m³ was exceeded on 75 days.

Table 46: Annual average $PM_{2.5}$ concentrations at Brackenham in µg/m³ (uMoya-NILU, 2026)

Year	2021	2022	2023	2024
Concentration	13.4	12.3	12.6	13.7

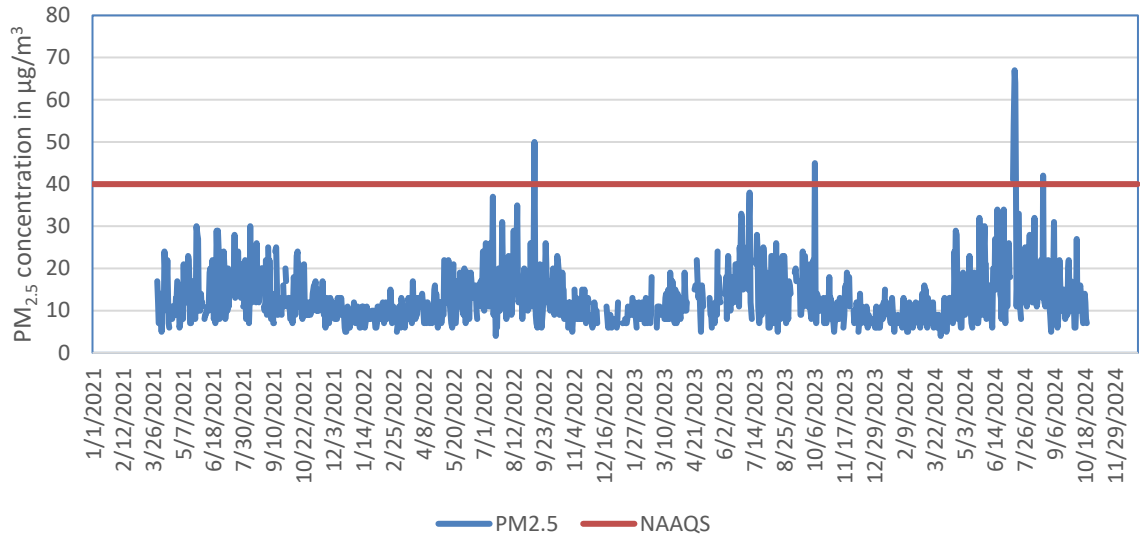


Figure 59: Daily average $PM_{2.5}$ concentrations (µg/m^3) measured at the Brackenham AQMS (uMoya-NILU, 2026)

Coal dust

A review of complaints listed in the RBCAA's monthly report for September 2022 (https://rbcaa.org.za/) highlights the negative impacts of coal dust on health and property in Arboretum, Alton, Birdswood, Veldenvlei, amongst others. There has been a significant demand internationally for coal which resulted in an increase in the amount of coal being brought to Richards Bay. It is stored and handled in open coal yards before being exported through the Port of Richards Bay. Fugitive emissions of coal dust from storage, handling and wind entrainment are sources of coal dust.

11.12.3 Air Quality - Site Sensitivity

The Site Sensitivity regarding air quality considers the existing state of air quality in Richards Bay and is based on the definition and understanding of sensitive receptors. Three sensitivity classes are defined for this Site Sensitivity assessment:

- High sensitivity: Hospitals, clinics, schools, daycare facilities and old age homes;
- Medium sensitivity: Residential areas; and
- Low sensitivity: Commercial and industrial areas.

For the Site Sensitivity assessment, receptors are assessed within a 5 km radius of the proposed Project's site, as indicated by the circle in Figure 60 below. Areas of high sensitivity include sensitive receptors as defined above, and up to 200 m around the respective receptors, indicated as red-shaded areas in Figure 60. Included are schools in, amongst others, Aquadene, Brakenham, Arboretum and Alton, and hospitals and clinics to the east of the proposed site.

The areas of medium sensitivity are residential areas within the 5 km radius and are indicated in orange-shaded areas. These are generally east of the R619 and include Aquadene, Brakenham,

Wild En Weide, Veldenvlei, Birdswood and Arboretum. Generally, people spend the majority of time in these areas.

Low sensitivity areas (blue-shaded areas) which are commercial and industrial areas i.e. non-residential are west of the R619 and include Atton; and south of the R34 including the PoRB. Low sensitivity rating is assigned as generally less time is spent by individuals who include economically active adults. Open unoccupied areas such as forests, agricultural areas, water bodies etc. are excluded from the Site Sensitivity.

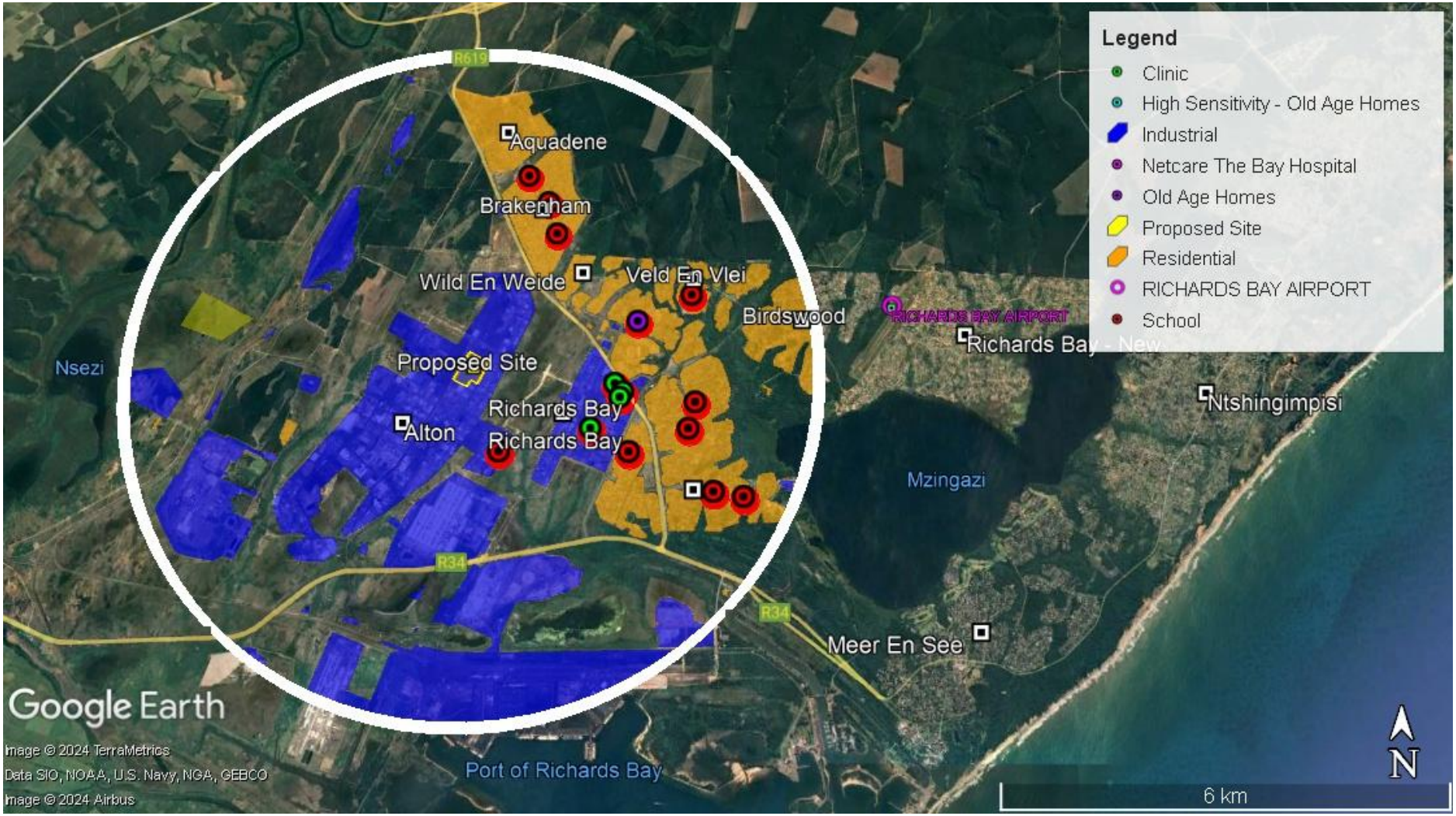


Figure 60: Relative location of the proposed Project in Richards Bay, air quality sensitivity demarcation and a circle indicate a 5 km radius around the site (Google Earth, 2024) (uMoya-NILU, 2026)

11.13 Visual Quality

The landscape associated with the site is similar to the industrial nature of the surrounding area. The site is situated within the industrial area of Alton and the purpose-built industrial estate of the RBIDZ, which is linked to the PoRB. According to the SSV that was undertaken for the Project, it is anticipated that the dense wooded grassland vegetation surrounding the site and within the immediate area (shown in Figure 61 below), as well as the distance from the residential areas, will contribute towards the Plant's low visibility.



Figure 61: Representative photographs of the study area, displaying dense but low vegetation cover, interspersed with tree clumps and surrounded by the existing industrial facilities (SAS, 2025)

The findings of the Visual Resource Compliance Statement (SAS, 2025) that was undertaken for the Project are contained in Section 12.8 below. The specialist report is contained in **Appendix E9**.

11.14 Noise & Vibration

In terms of the local acoustical environment, the background noise levels are expected to be typical of an industrial area, considering the site's proposed location in the RBIDZ Phase 1F and the surrounding industrial land use.

The following information was extracted from the Noise Impact Assessment (Enviro-Acoustic Research, 2026). Refer to Section 12.9 below for a synopsis of the study. The specialist report is contained in **Appendix E8**.

11.14.1 Existing Ambient Sound and Noise Levels

Industrial and road traffic noises is relatively dominant in the area.

11.14.2 Potential Noise-Sensitive Receptors

Figure 62 below shows the locations of potential noise-sensitive receptors as well as generalised 200 m, 500 m, 1 000 m and 2 000 m buffer areas around the project location.

Generally, noises from such industrial activities:

- Would be significant within 200 m from the site, with high noise levels that could be considered to be at a disturbing level both day and night. No noise-sensitive receptors were identified within this buffer distance;
- Are significant and clearly audible within 500 m, with receptors staying within 500m from activities being able to detect the change in ambient sound levels with potential complaints about the noise levels. No noise-sensitive receptors were identified within this buffer distance;
- Are generally clearly audible, but the noise impact is normally limited to a distance of approximately 1 000 m from the active power generation activities. Ambient sound levels may be increased due to noises from the power generation activities, with the potential noise impact measurable and audible. Noise levels ranging between 45 and 50dBA are expected at 1 000 m. There are at least two hostels (NSR09 and 10) located approximately 1 000 m from the site; and
- Are generally audible up to a distance of 2 000 m and may be audible up to 4 000 m during very quiet periods at night with certain meteorological conditions. Noises are generally of a low concern at distanced greater than 2 000 m from power generation activities. The residential area of Wild en Weide and Brackenham are located within this buffer area (represented by NSR01 - 08).

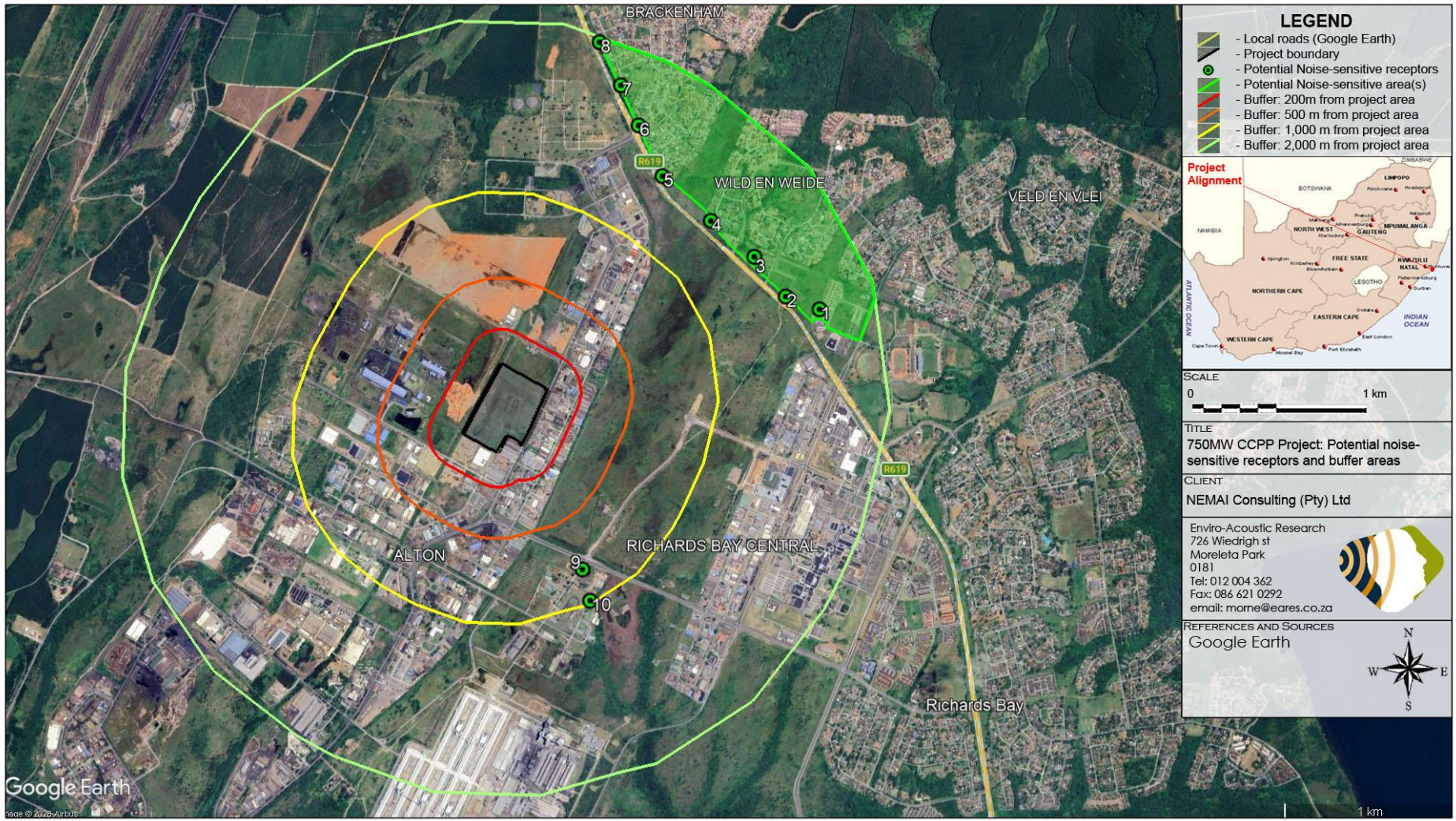


Figure 62: Nearest noise-sensitive receptors and buffer areas in relation to the project area (Enviro-Acoustic Research, 2026)

11.15 Agriculture

11.15.1 DFFE Screening Tool

According to the Screening Tool, the site occurs in areas of high and very high sensitivity in terms of the Agricultural Theme (see Figure 63 below). The sensitivity is based on the land capability, which ranges from moderate to high, high, high to very high, and very high.

The following findings were made as part of the SSV by the Agricultural Specialist:

- The site is within a Security Control Area, which is an industrial area and zoned as such. There is no access to the site that will allow for cultivation or any other agricultural use;
- A large portion of the site is water saturated and is thus not suitable for farming; and
- The soil consists of windblown alluvial sand. It is coarse grained sand, low in plant nutrients and has a low cation exchange capacity, which makes the soil unable to retain plant nutrients from leaching. This is a prerequisite for successful long term crop production.

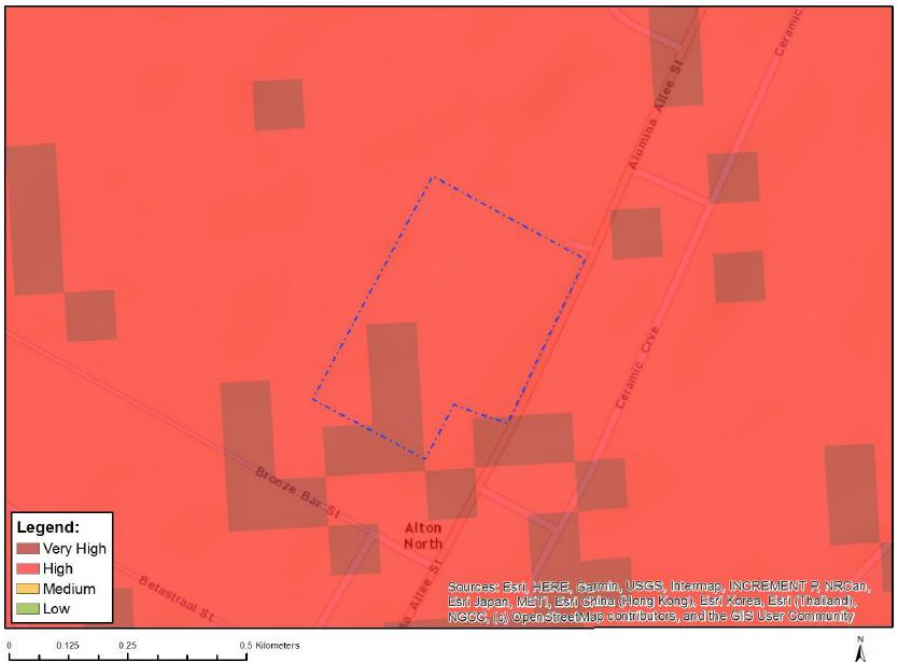


Figure 63: Map of relative Agricultural Theme sensitivity (Screening Tool)

The findings of the Agricultural Agro-Ecosystem Assessment Statement (Index, 2024) that was undertaken for the Project are contained in Section 12.14 below. The specialist report is contained in **Appendix E14**.

11.16 Planning

11.16.1 Municipal Planning

The CoU's SDF is shown in Figure 64 below. According to the CoU (2022b), the history and potential of the RBIDZ is key in considering the development of industry and manufacturing in

uMhlathuze. The benefits to industries located in the RBIDZ include the following (amongst others) (CoU, 2022b):

- ❑ Existing efficient deep-water port;
- ❑ Suited to export-orientated production;
- ❑ Customs controlled area;
- ❑ VAT and import duty exemption;
- ❑ Same time zone as Europe;
- ❑ Strategic location to access world markets;
- ❑ Allowance for 100% foreign ownership; and
- ❑ Established local and service industries.

The SDF identified various nodes based on spatial characteristics, primary land use characteristics, roles as well as the functions of the node to the Municipality and the larger region (CoU, 2022b). Table 47 below provides an analysis of the Richards Bay Node, as contained in the CoU SDF (CoU, 2022b). The Richards Bay primary node represents the single largest population concentration as well as concentration of economic activities and social facilities within the municipal area.

Table 47: Analysis of Richards Bay Node (CoU, 2022b)

Role in the City	▪ Prominent developing industrial centre in SA. ▪ Centres of employment, industrial, residential, mining, offices, ecotourism, nature reserve and commercial activity.
Role in the Region	▪ It is well positioned to full advantage of the export of manufactured goods and raw materials & minerals to Africa and the rest of the world. ▪ It functions as a major link to the world economy through the PoRB. ▪ It is regarded as the eco-tourism and nature reserve gateway. ▪ It plays a dominant role in KZN, especially within the commercial and industrial sectors. ▪ It plays a major role in the regional economy as a service centre (industrial, retail, commercial, business, transportation, administrative and office core etc.).
Movement System	▪ N2, John Ross Highway, P231 and North Central Arterial are major access and linkage systems traversing the Richards Bay Node. ▪ West Central Arterial and East Central Arterial provide access and linkage within and between the other Municipal nodes.
Current Urban Form & Land Uses	▪ **Social Infrastructure**: Public & private administration offices, recreation, medical facilities, residential, community halls, public transport facilities, educational facilities, social/welfare facilities, SAPS, tourism, churches, cemeteries, magistrate court and petrol filling stations. ▪ **Commerce & Industry**: Harbour, manufacturing, hotel, restaurants, informal trading, retail, finance & insurance, banking facilities, building supplies, furniture, motor showroom and, wholesalers. ▪ **Transportation:** Rail, Sea, Air and Road. ▪ **Road**: Highways- Public (Buses, minibuses, vans & metred taxis) & Private transportation. ▪ **Rail**: Linked to the National System. ▪ **Sea**: Linked to the world. ▪ **Air**: Linked to the National System. ▪ **Residential**: Mixed used development (low-high density).
Service Levels	▪ **Physical Infrastructure**: Water supply, waterborne system, electrification, solid waste disposal, storm-water management and telecommunication services. Existing capacity will be upgraded to accommodate increased densities and expansion of urban residential areas as well as industrial areas.
Open Space / Environment	▪ **Open Space and Conservation**: Urban recreation (public parks, private open spaces and conservation areas).

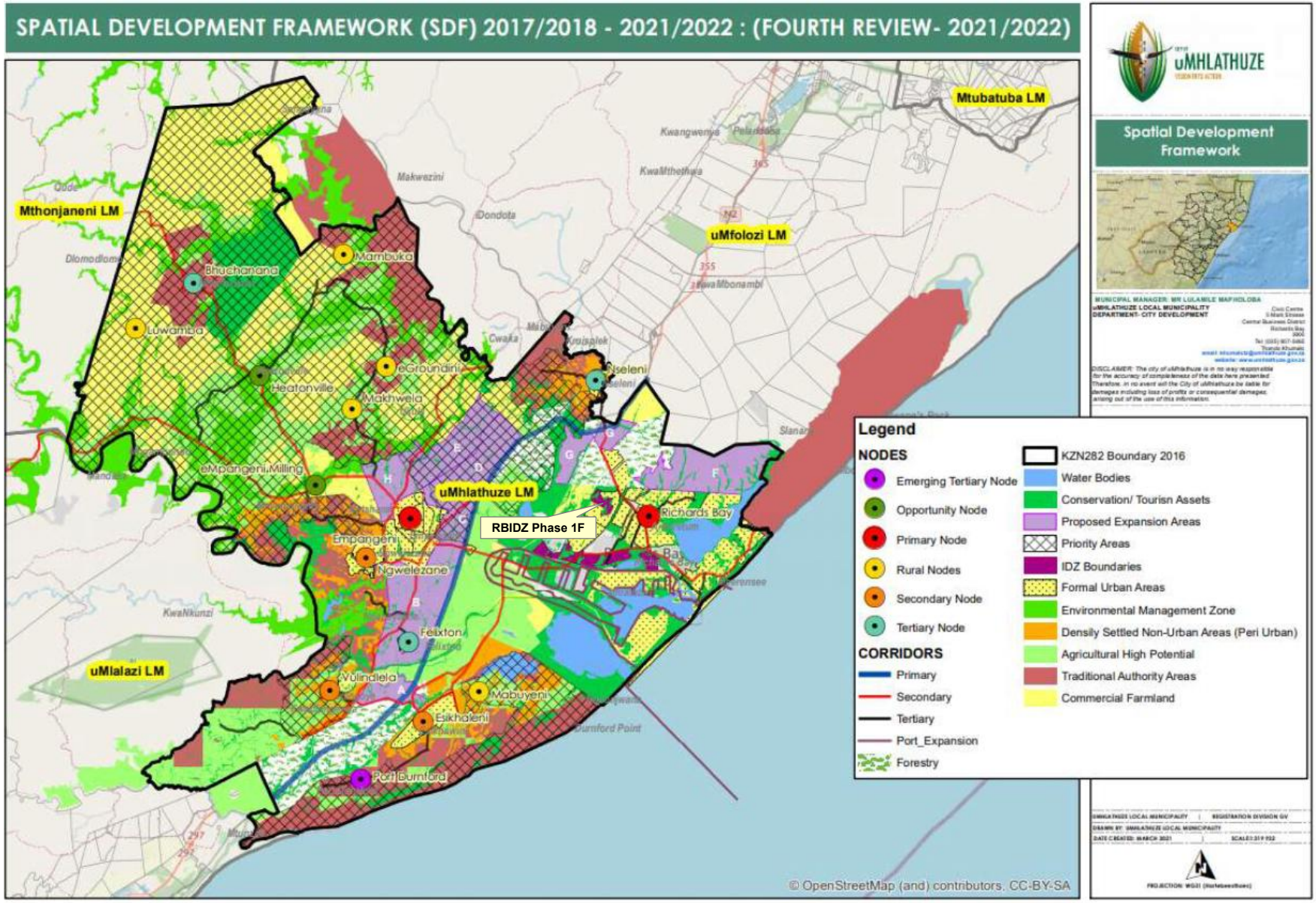


Figure 64: CoU SDF (CoU, 2022b)

The location of Catalytic and Strategic Projects in CoU, which include the RBIDZ, are shown in Figure 65 below.

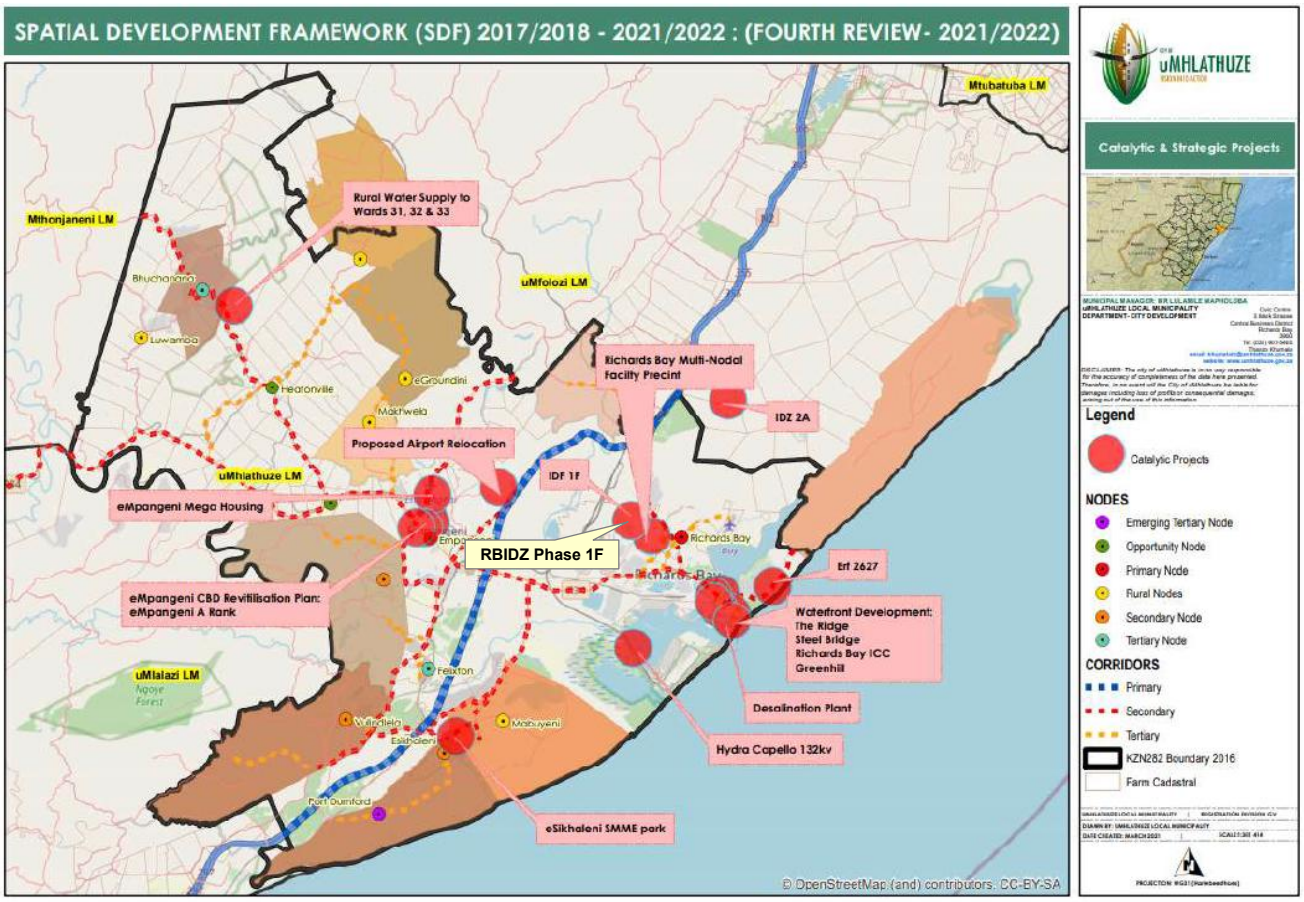


Figure 65: Location of Catalytic and Strategic Projects in CoU (CoU, 2022b)

11.16.2 RBIDZ

Situated on the north-eastern South African coast, the RBIDZ SEZ is a purpose-built and secure industrial estate that is connected to the international seaport of Richards Bay. Its purpose is to facilitate manufacturing, as well as the storage of minerals and products to promote beneficiation, investment, economic growth, skills development, and employment.

To boost employment and economic growth and diversify South Africa's export offerings, the RBIDZ strategy is to attract small- to medium-sized industrial operations. It also aims to cluster smaller, downstream manufacturing businesses around the city's major industries. This investment sector's goal is to promote economic expansion, employment development, resource exploitation, and human empowerment, as well as to encourage international competitiveness and attract export-orientated manufacturing investment through its superb industrial infrastructure, well-established network of shipments, and tax- and duty-free incentives (https://www.rbidz.co.za/index.php/corporate-profile/about-us).

The mapped phases of the RBIDZ are shown in Figure 66 below. The RBIDZ comprises of 240 hectares of fully-developed and serviced land in its two part Customs Controlled estates.



Figure 66: RBIDZ mapped phases

The CoU IDP for 2022/2027 (CoU, 2022a) and the SDF (CoU, 2022b) acknowledge the importance of the RBIDZ a prime industrial business and trade hub with prime rail and road access, and the strategic linkage of the SEZ with the PoRB. The CoU SDF aims to seek alignment with long term future Port Development Framework and RBIDZ Plans. It is also noted in the IDP that the CoU together with RBIDZ and TNPA have established a tripartite committee focusing on strategic investments and job creation within the municipality.

The Project's siting is based on the advantages posed by the RBIDZ, including the appropriate zoning (current zoning of the site is "Noxious Industry"), availability of services and strategic location (including proximity to the PoRB).

11.17 Waste

Some notes in the Integrated Waste Management Plan (IWMP) (CoU, 2022c) in terms of waste management in the municipality include the following:

- The regional landfill, which is used for general waste disposal, is owned by the KCDM. The permit was granted in 2003 under the name uThungulu District Municipality (Permit Number 16/2/7/W1/D1/Z1/P485) and it was amended in 2012 to incorporate recycling on site under a new Waste Management Licence number (DC 28/WML/0002/2012);
- There are two waste transfer stations in the municipality, which are located in Alton and Ntambanana; and
- There are two MRFs in the municipality, which include Mzingazi MRF and eNseleni MRF.

Various waste types will be generated during the Project's construction and operational phases (see Section 9.8.3 above).

11.18 Transportation

The access point to the industrial complex is via Alumina Allee Road (see Figure 67 and Figure 68 below), which runs along the eastern boundary of the site. Alumina Allee Road is the main route through Alton North traversing a north-south direction through the industrial area. The route provides linkage to the R619 in the north and the South Central Arterial as well as R34 John Ross Highway in the south. The R34 as well R619 provides access to the N2 highway (see Figure 69 below).



Figure 67: Controlled access point to the RBIDZ Phase 1F (site located to the left, outside of view)



Figure 68: North-western view of access to the RBIDZ from Alumina Allee Road (Google Earth™)

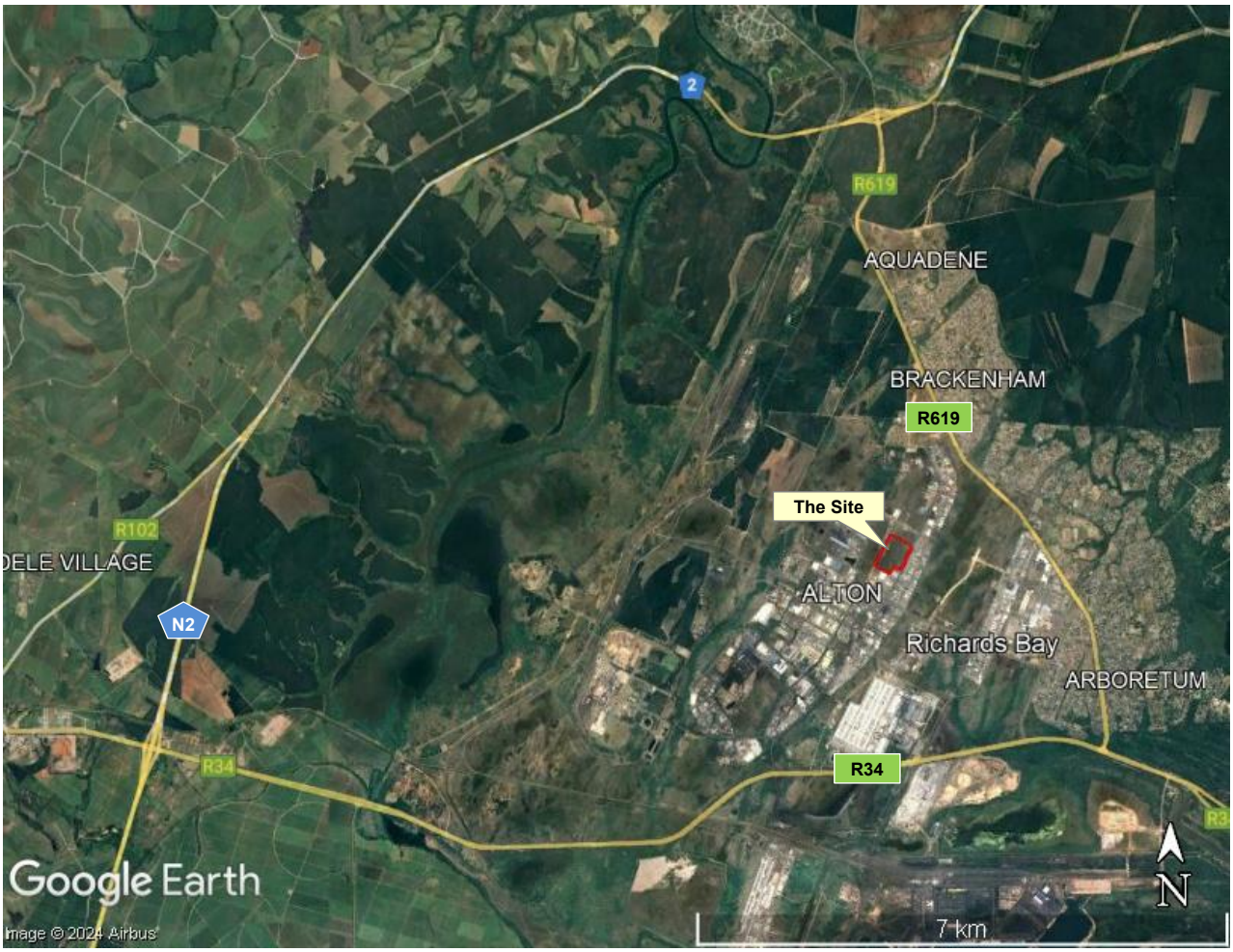


Figure 69: View of the N2, R34 and R619 in relation to the project site (Google Earth™)

A description of the road network most likely to be affected by the overall RBIDZ Phase 1F development is presented below, based on the Traffic Impact Assessment (Zutari, 2024):

- **National Road 2** (N2): The CoU is strategically located in close proximity to the N2 national route, which is of strategic importance for transporting materials and products to / from the RBIDZ development. The N2 is a Class 1 Principal Arterial Road that carries intercity traffic from the Western Cape through KZN to Ermelo. Within KZ the N2 links Richards Bay to Durban as the two main commercial and industrial centres in the Province.
- **R619**: The R619, also known as the North Central Arterial, features a single lane in each direction, with road widening at intersections to accommodate turning lanes. The road is 7 m wide and runs in a southeast to northwest direction. As a Class 2 Major Arterial Road, the R619 provides crucial mobility for the region. Located in the northern part of Richards Bay, it links the area to the N2 highway and provides primary access to surrounding residential settlements, the CBD, and industrial regions. The road is heavily utilised by both heavy and light vehicles.
- **Alumina Allee**: Alumina Alley is a 14 m wide road with two lanes in each direction, featuring widened intersections to accommodate turning lanes. It runs in a north-south direction between the John Ross Highway in the south and the R619 in the north. As a Class 3 Minor Urban Arterial Road, it connects the southern and northern areas of Richards Bay, facilitating access to the site and linking to the R34 in the south. Towards the north, the road becomes Heliumhoogte Road and connects to the R619. This road experiences high volumes of heavy vehicle traffic.
- **Chalk Line**: Chalk Line is a dual carriageway with two lanes in each direction, separated by a centre median. This road runs in an east-west direction between Alumina Alley in the west and the East Central Arterial in the east. It is a Class 3 Minor Urban Arterial Road, connecting the eastern and western areas of Richards Bay.
- **R34** (John Ross Highway): The R34 is a Class 2 Major Arterial Road located in the southern region of Richards Bay. It provides essential mobility for the area, connecting to the N2 highway and offering primary access to Bhiliya and surrounding areas via the P106, as well as to the industrial regions and the PoRB.

According to CoU (2022b), Richards Bay has experienced an unprecedented influx of trucks into the area that are *en route* to deliver bulk goods to the PoRB or delivering such bulk commodities to various sites within the municipality for temporary storage prior to delivery to the Port for export. The situation is aggravated by the fact that the operations at the PoRB was originally designed to be services by rail line. The CoU developed a Comprehensive Integrated Transport Plan (CITP) with the assistance of the National Department of Transport. Amongst others, the aforementioned plan caters for a Transport Needs Assessment, Public Transport Operational Strategy, Transport Infrastructure Strategy, Travel Demand Management, Freight Logistics Strategy, and Other Transport-related Strategies (CoU, 2022b). TNPA also identified the need to develop a Roads Master Plan, which will consider the rehabilitation of certain road sections as well as the upgrading and expansion of the road network within the PoRB.

11.19 Heritage & Palaeontology

11.19.1 General History of Greater Area

According to Nemai Consulting (2016), the available evidence, as captured in the Amafa and Natal Museum heritage site inventories, indicates that the greater Richards Bay area contains a wide spectrum of archaeological sites covering different time-periods and cultural traditions. These range from Early Stone Age, Middle Stone Age, Later Stone Age to Early Iron Age, Middle Iron Age, and Later Iron Age sites. A large percentage of more recently recorded sites occur along the dune cordon and slightly inland in the form of shell middens which were mostly created by Iron Age shellfish gatherers although some of the stratigraphic layers may extend back to Later Stone Age periods.

11.19.2 DFFE Screening Tool

11.19.2.1 Sensitivity

The following is noted in terms of the sensitivity of the site, as determined using the Screening Tool:

- Archaeological and Cultural Heritage Theme – low sensitivity (see Figure 70 below); and
- Palaeontology Theme – low sensitivity (see Figure 71 below).

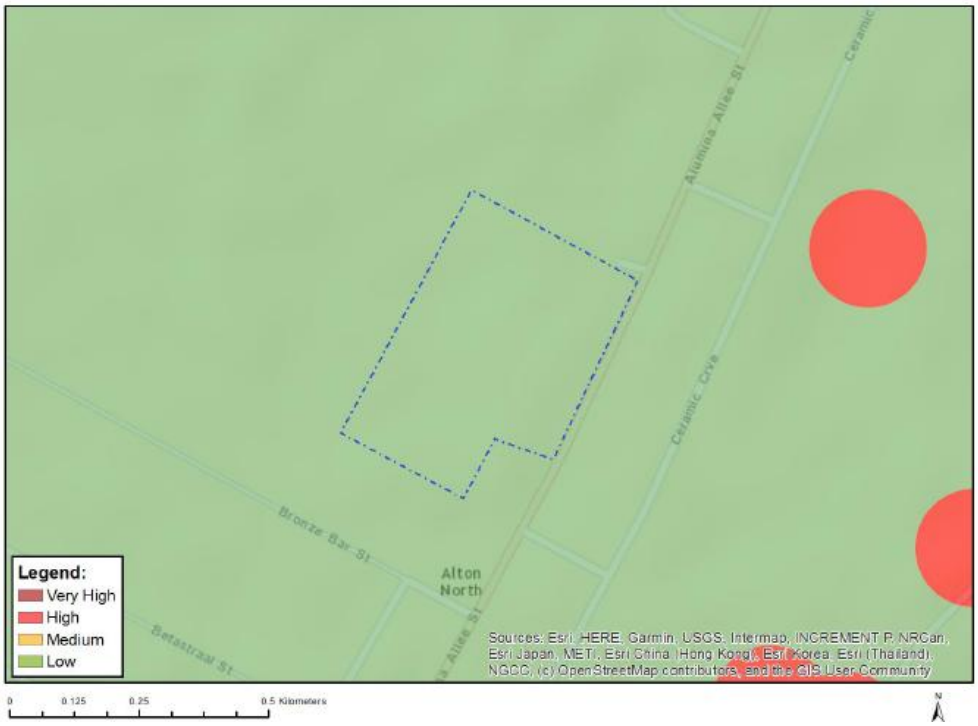


Figure 70: Map of relative Archaeological and Cultural Heritage Theme sensitivity (Screening Tool)



Figure 71: Map of relative Palaeontology Theme sensitivity (Screening Tool)

11.19.2.2 Archaeological and Cultural Heritage Theme

Some key findings of the heritage SSV that was undertaken for the Project include the following (Nitai Consulting, 2024):

- An examination of the information depicted on the earliest edition (and subsequent editions) of the historical topographic map sheets was undertaken. The map sheet consulted was the South Africa 2832CA Kwa Mbonambi sheet, Edition 1 1943; Edition 3 1982 and Edition 4 2005. Any heritage structures or features that are 60 years or older would be depicted on the first edition sheet. As can be seen in Figure 72 to Figure 74 below, the 1943 edition 1 map, as well as the subsequent editions obtained (1982 and 2005), depict no heritage features or structures on the site.
- The Heritage Impact Assessment that was undertaken as part of the EIA for the RBIDZ Phase 1F found no significant heritage resources within the greater industrial estate. Several other Heritage Impact Assessment reports for areas in the immediate vicinity of the current project area were also reviewed.

It is noted that the Richards Bay Cemetery is located approximately 1.2km to the north of the site.

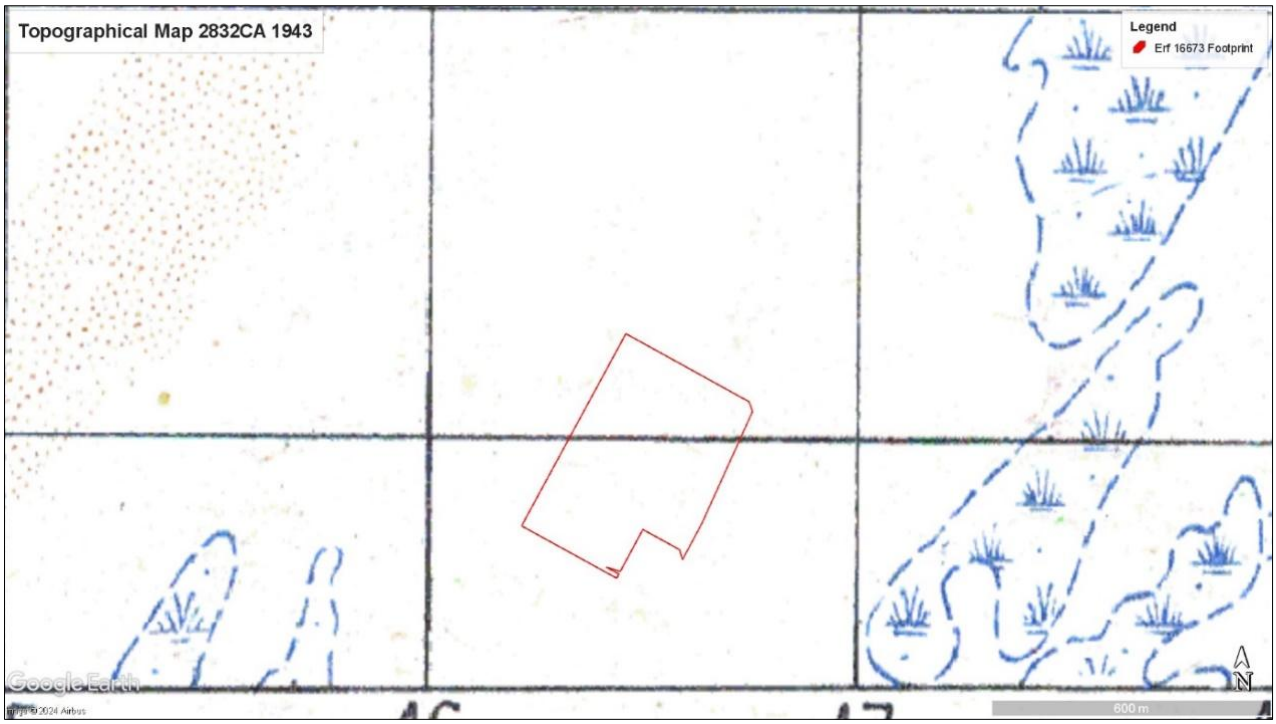


Figure 72: Enlarged view of topographic map 2832CA Ed 1 1943, depicting no heritage structures or features within or in the vicinity of the site (Nitai Consulting, 2024)



Figure 73: Enlarged view of topographic map 2832CA Ed 3 1982, depicting no heritage structures or features within or in the vicinity of the site (Nitai Consulting, 2024)

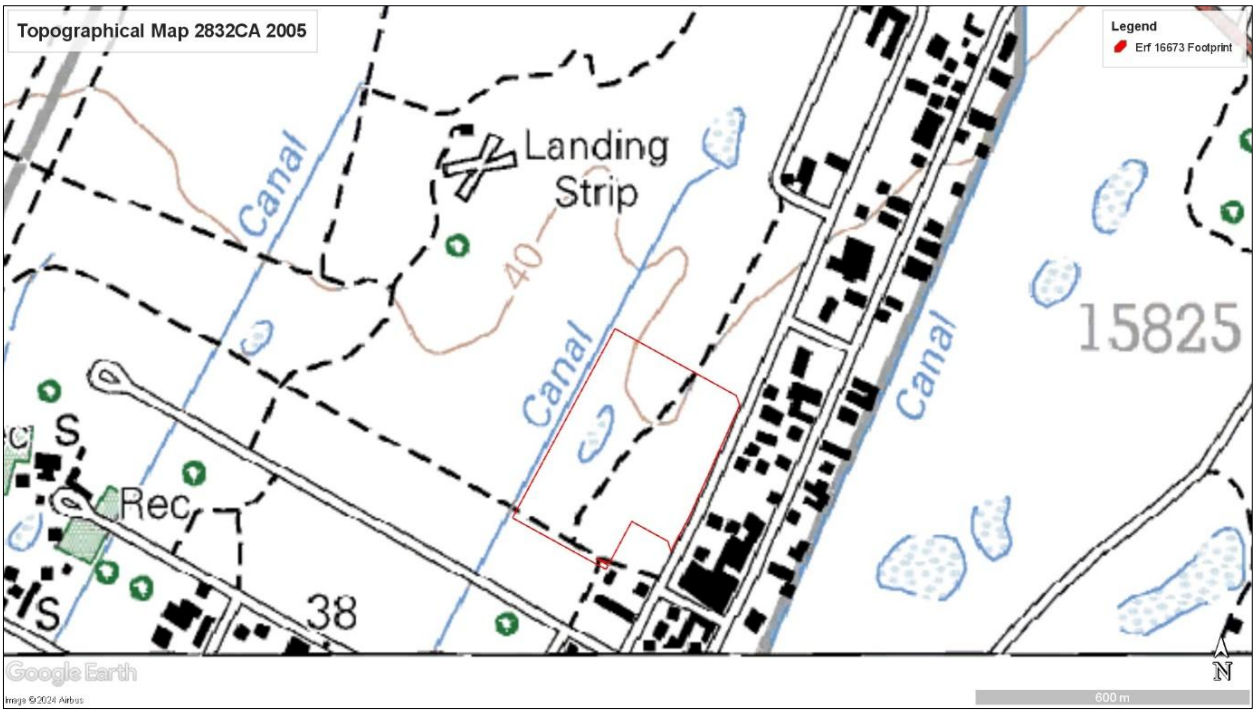


Figure 74: Enlarged view of topographic map 2832CA Ed 4 2005, depicting no heritage structures or features within the project footprint (Nitai Consulting, 2024)

11.19.2.3 Palaeontology Theme

The proposed study area is underlain by unconsolidated Quaternary dune sands derived from the reworking of the Kosi Bay Formation on the Northern Natal coastal plain that resulted from marine regression and dry periods when dune formation was wide spread. These are characterised as yellowish-red, grey, and white dune sands with local pockets of calcareous clays.

The South African Heritage Resources Information System (SAHRIS) Palaeontological Sensitivity Map classifies the area as having Low Palaeontological Sensitivity (see Figure 75 below) (Almond & Pether, 2009; Almond *et al*., 2013, as cited in Banzai Environmental, 2026), which is supported by the DFFE Screening Tool Report.

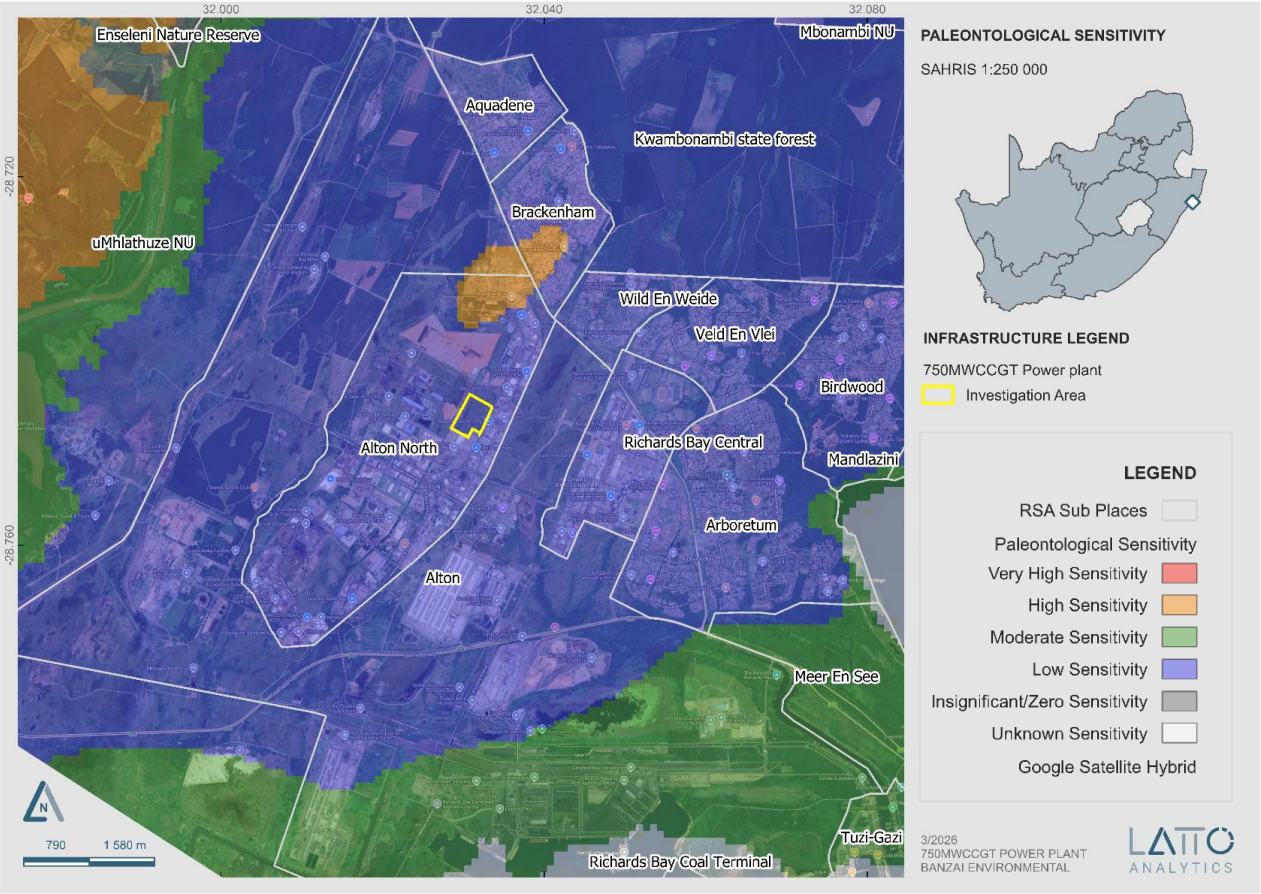


Figure 75: Extract of the SAHRIS PalaeoMap (Banzai Environmental, 2026))

11.20 Existing Structures and Infrastructure

As mentioned, the EA that was granted for the RBIDZ Phase 1F in Sept 2016 (reference no.: 14/12/16/3/3/2/665) made provision for the following infrastructure (shown in Figure 5 above):

- Water infrastructure;
- Sewer infrastructure;
- Stormwater infrastructure;
- Roads; and
- Electrical services.

Water and sewer pipelines, as well as the tarred access road, run along the western boundary of the site. In addition, a stormwater canal (shown in Figure 41 and Figure 42 above) also runs parallel to the western side of the site, which conveys stormwater from the RBIDZ in a south-westerly direction. There are no existing registered servitudes on the site.

11.21 Health

The following information was extracted from the Community Health Impact Assessment (Niara Environmental Consultants, 2026). Refer to Section 12.11 below for a synopsis of the study. The specialist report is contained in **Appendix E10**.

11.21.1 Municipal Health Profile

The CoU is the principal urban and economic node within KCDM and includes Richards Bay and Empangeni, which function as the main commercial, industrial and service centres in the district. The broader district profile in the District Health Barometer (DHB) 2023/24 identifies Richards Bay and Empangeni as the dominant urban centres within King Cetshwayo, while the municipal website confirms that the City has dedicated Public Health and Emergency Services, as well as separate municipal functions for water and sanitation, transport, roads, coastal management and stormwater, and electrical and energy services. This is important for the Community Health Impact Assessment because it shows that the municipality is both the local service hub for surrounding communities and the primary institutional interface for environmental health, emergency response and basic municipal service delivery in the project area.

From a community health perspective, the local profile of uMhlathuze must also be understood in relation to its industrial and urban character. The municipality contains the RBIDZ, the PoRB, major industrial operations, established transport corridors, and surrounding residential communities. This means that local health outcomes are shaped not only by access to healthcare, but also by the environmental and social determinants of health associated with urban-industrial development, including air quality, traffic volumes, noise, occupational-community interfaces and differential access to infrastructure. The proposed 750 MW CCGT Power Plant is planned within this municipal setting, and its potential health implications must therefore be considered against an existing baseline characterised by concentrated industrial activity, mixed residential settlement patterns and established municipal service systems. This is particularly relevant for respiratory health, injuries and accidents, social determinants of health, health system capacity and cumulative exposure pathways, which are central themes in this Community Health Impact Assessment.

In practical terms, the CoU should be regarded as the primary local health and service environment within which the proposed Project will operate. The municipality appears to have comparatively stronger institutional and service capacity than more remote parts of the district, but the DHB indicates that important health challenges remain, particularly in maternal and neonatal outcomes. Because uMhlathuze combines urban growth, industrial expansion and concentrated service delivery functions, it is likely to experience both the potential benefits of the proposed development, such as employment and local economic activity, and the potential burdens, including additional environmental stressors and service demand. The local municipal health profile therefore provides a critical baseline for assessing how project-related changes may interact with existing vulnerabilities and strengths within the host municipal area.

11.21.2 Potentially Affected Communities

Potentially affected communities refer to communities located within the project's Zone of Influence that may experience direct, indirect or cumulative health impacts associated with the proposed development.

These communities, which are shown in Figure 76 and listed in Table 48 below, were identified based on the following:

- Proximity to the project site;
- Population distribution;
- Presence of sensitive receptors;
- Environmental exposure pathways;
- Socio-economic linkages to the project.

Table 48: Potentially Affected Communities (PACs) (Niara Environmental Consultants, 2026)

Category	Distance from Site	Nature of Potential Impacts	Communities
Primary PACs	2–5 km	Communities most likely to experience direct environmental exposures, including potential impacts from air emissions, noise propagation, traffic movements and industrial activities associated with the project.	Wild en Weide; Brackenham; Veld en Vlei; Alton
Secondary PACs	5–10 km	Communities that may experience indirect environmental and socio-economic impacts, including exposure to lower levels of air pollutants, increased traffic activity, and broader socio-economic changes linked to the project.	Arboretum; Birdswood; Aquedene; Meer en See; Greenhill
Tertiary PACs	>10 km / Regional Context	Communities located within the broader regional context that may experience indirect socio-economic effects, such as employment opportunities, labour migration and regional economic development associated with the project.	Nseleni; Empangeni; Sebokwe; Ntshingimpisi

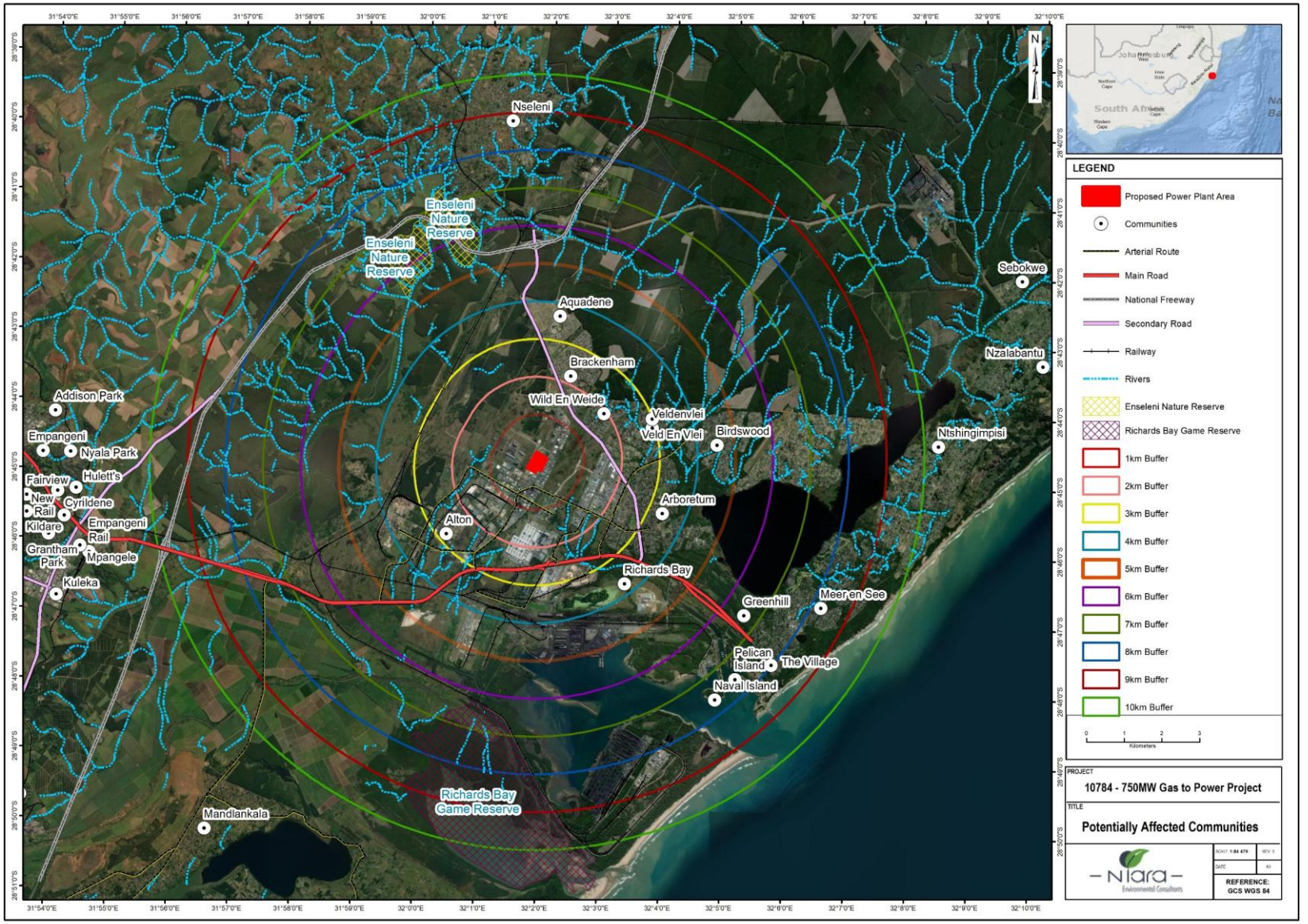


Figure 76: Potentially affected communities from a community health perspective (Niara Environmental Consultants, 2026)

11.21.3 Sensitive Receptors Relevant to Energy Infrastructure Projects

The proposed 750 MW CCGT Power Plant will be located within an established industrial zone in Richards Bay. However, several residential communities, social infrastructure facilities and ecological receptors are located within the broader 10 km Zone of Influence.

Within the project's Zone of Influence, the following sensitive receptors from a health perspective were identified:

- Healthcare Facilities -
  - Richards Bay Municipal Clinic;
  - Civic Centre Clinic;
  - Mandlazini Clinic;
  - Medicross Medical Centre;
  - Greenhill Medical Centre; and
  - CarePoint Industrial Health Services.
- Educational Facilities -
  - Aquedene Secondary School;
  - Sinaye Primary School;
  - Mahubela Primary School;
  - Ntongande High School;
  - Lizwi Secondary School;
  - Old Mill High School; and
  - Siyakhanyisa Primary School.
- Ecological Receptors -
  - Enseleni Nature Reserve;
  - Richards Bay Game Reserve; and
  - Local river systems and wetlands.

These receptors are important considerations when assessing potential environmental health risks associated with the proposed development.

12 SUMMARIES OF SPECIALIST STUDIES

12.1 Specialist Studies Triggered

12.1.1 Specialist Studies Identified by the Screening Tool

As mentioned in Section 6.3 above, the Screening Report for the proposed Project was compiled by means of the Screening Tool, which was appended to the Application Form that was submitted to DFFE. Table 49 below lists the specialist studies that were identified in the Screening Report and notes the relevance of these studies to the Project based on Site Sensitivity Verification (SSV). The SSV Report is contained in the Scoping Report, which was accepted by DFFE. The SSV Report is also included in **Appendix M**.

Note the descriptions of the relevant features of the receiving environment in Section 11 above that relate to the various themes listed in Table 49 below.

Table 49: Relevance of specialist studies identified in the Screening Report

No.	Specialist Study identified in Screening Report	Relevance to the Project following Site Sensitivity Verification
1.	**Agricultural Impact Assessment**	According to the Screening Tool, the site occurs in areas of high and very high sensitivity in terms of the Agricultural Theme. The SSV undertaken by the Agricultural Specialist did not agree with this sensitivity determined by the Screening Tool for the following reasons: ▪ The site is within a Security Control Areas, which is an industrial area and zoned as such. There is no access to the site that will allow for cultivation or any other agricultural use; ▪ A large proportion of the site is water saturated and, therefore, no suitable for farming purposes; and ▪ The soil consists of windblown alluvial sand. It is coarse grained sand, low in plant nutrients and has a low cation exchange capacity, which makes the soil unable to retain plant nutrients from leaching. This is a prerequisite for successful long term crop production. Based on the findings of the SSV, an Agricultural Agro-Ecosystem Assessment Statement was compiled. The report is contained in **Appendix E14** and the findings are presented in Section 12.14 below.
2.	**Landscape/Visual Impact Assessment**	Although the Screening Tool indicates the need for a Visual Impact Assessment, the tool did not indicate visual/landscape sensitivity for the study area. The SSV undertaken by a specialist determined that the landscape associated with the study area is similar to its surroundings and the larger region. The study area is situated within the RBIDZ, therefore it is surrounded by industrial development. The field assessment further indicated that the dense wooded grassland vegetation surrounding the study area and within the immediate area as well as the distance from the residential areas, renders no visibility of the proposed development. Based on the SSV, a Visual Resource Compliance Statement was undertaken for the Project. The report is contained in **Appendix E9** and the findings are presented in Section 12.8 below.
3.	**Archaeological and Cultural Heritage Impact Assessment**	According to the Screening Tool, the site occurs in an area of low sensitivity in terms of the Archaeological and Cultural Heritage Theme.

No.	Specialist Study identified in Screening Report	Relevance to the Project following Site Sensitivity Verification
		Some key findings of the heritage SSV that was undertaken by a specialist include the following (Nitai Consulting, 2024): ▪ The earliest edition (and subsequent editions) of the historical topographic map sheets of the study area depict no heritage features or structures on the site; and ▪ The Heritage Impact Assessment that was undertaken as part of the EIA for the RBIDZ Phase 1F found no significant heritage resources within the greater industrial estate. Several other HIA reports for areas in the immediate vicinity of the current project area were also reviewed. The low sensitivity of the site determined by the Screening Tool was thus confirmed during SSV. An Application for Exemption from preparing a Heritage Impact Assessment (contained in **Appendix G**) was submitted to KZN Amafa and Research Institute. In response, the KZN Amafa and Research Institute issued a No Objection Letter (contained in **Appendix G**), which states that the Project is exempted from a further Full Phase 1 Heritage Impact Assessment.
4.	**Palaeontology Impact Assessment**	According to the Screening Tool, the site occurs in an area of low sensitivity in terms of the Palaeontology Theme. The low sensitivity of the site determined by the Screening Tool was confirmed during SSV, which was undertaken by a specialist. Hence, only a Desktop Palaeontology Impact Assessment was undertaken for the Project. The report is contained in **Appendix E15** and the findings are presented in Section 12.13 below.
5.	**Terrestrial Biodiversity Impact Assessment**	According to the Screening Tool, the site occurs in an area of very high sensitivity in terms of the Terrestrial Biodiversity Theme. The SSV undertaken by a specialist determined that several historic and current pressures on the vegetation within the study area were present. However, some sections of seemingly intact vegetation remained. Hence, a Terrestrial Biodiversity Assessment was undertaken for the Project. The report is contained in **Appendix E4** and the findings are presented in Section 12.7 below.
6.	**Aquatic Biodiversity Impact Assessment**	According to the Screening Tool, the site occurs in areas of very high and low sensitivity in terms of the Aquatic Biodiversity Theme. The SSV undertaken by a specialist supported the sensitivity rating assigned by the Screening Tool, as a depression wetland occurs on the site. Hence, a Freshwater Ecosystem Assessment was undertaken for the Project. The report is contained in **Appendix E3** and the findings are presented in Section 12.6 below.
7.	**Hydrology Assessment**	The Screening Tool did not assign any sensitivity to the study area for this theme. However, the SSV undertaken by a specialist confirmed the presence of a depression wetland on the site. In addition, a stormwater canal runs parallel to the western side of the site. Hence, a Hydrology Assessment was undertaken for the Project. The report is contained in **Appendix E7** and the findings are presented in Section 12.10 below.
8.	**Noise Impact Assessment**	The SSV undertaken by a specialist supported the sensitivity rating assigned by the Screening Tool. Based on the nature of the Project and its potential impacts, a Noise Impact Assessment was undertaken. The report is contained in **Appendix E8** and the findings are presented in Section 12.9 below.
9.	**Traffic Impact Assessment**	A Traffic Impact Assessment for the broader Phase 1F development of the RBIDZ was previously undertaken in 2013, which was updated in 2024. This updated Traffic Impact Assessment was incorporated into the EIA Report (see summary provided in Section 12.15 below) and is contained in **Appendix F**.
10.	**Geotechnical Assessment**	Based on the nature of the Project, a Geotechnical Assessment was undertaken and the findings were incorporated in the EIA Report. The report is contained in **Appendix E16.**
11.	**Climate Change Impact Assessment**	Based on the nature of the Project and its potential impacts, a Climate Change Impact Assessment was undertaken. The report is contained in **Appendix E1** and the findings are presented in Section 12.4 below.

No.	Specialist Study identified in Screening Report	Relevance to the Project following Site Sensitivity Verification
12.	**Health Impact Assessment**	Based on the nature of the Project and its potential impacts, a Health Impact Assessment was undertaken. The report is contained in **Appendix E10** and the findings are presented in Section 12.11 below.
13.	**Socio-Economic Assessment**	Based on the nature of the Project and its potential impacts, a Socio-Economic Impact Assessment was undertaken. The report is contained in **Appendix E11** and the findings are presented in Section 12.12 below.
14.	**Air Quality Impact Assessment**	Based on the nature of the Project and its potential impacts, an Air Quality Impact Assessment was undertaken. The report is contained in **Appendix E2** and the findings are presented in Section 12.5 below.
15.	**Plant Species Assessment**	According to the Screening Tool, the site predominantly occurs in an area of medium sensitivity in terms of the Plant Species Theme. The SSV undertaken by a specialist determined that most of the site is in a degraded state. However, natural (untransformed) vegetation was present. Hence, a Plant Species Assessment was undertaken for the Project. The report is contained in **Appendix E5** and the findings are presented in Section 12.7.5.2 below.
16.	**Animal Species Assessment**	According to the Screening Tool, the site occurs in an area of high sensitivity in terms of the Animal Species Theme. The SSV undertaken by a specialist determined that large portions of the site had previously been transformed or degraded. However, natural (untransformed) vegetation was still present. Hence, an Animal Species Assessment was undertaken for the Project. The report is contained in **Appendix E6** and the findings are presented in Section 12.7.5.3 below.

12.2 Specialist Studies Undertaken for the Project

A crucial element of the Plan of Study for the EIA prepared during the Scoping phase was to provide the Terms of Reference for the requisite specialist studies triggered during Scoping. According to Münster (2005), a 'trigger' is "*a particular characteristic of either the receiving environment or the proposed project which indicates that there is likely to be an issue and/or potentially significant impact associated with that proposed development that may require specialist input*".

The following studies were undertaken for the Project, based on the outcomes of the Scoping exercise and Screening:

- **Studies based on the Screening Tool and SSV** –
  - Climate Change Impact Assessment;
  - Air Quality Impact Assessment;
  - Freshwater Ecosystem Assessment;
  - Terrestrial Biodiversity Assessment;
  - Floral (Plant Species) Assessment;
  - Faunal (Animal Species) Assessment;
  - Visual Resource Compliance Statement;
  - Hydrology Assessment;
  - Noise Impact Assessment;
  - Traffic Impact Assessment (for the broader Phase 1F development of the RBIDZ);
  - Geotechnical Assessment;

- Desktop Palaeontology Impact Assessment;
- Agricultural Agro-Ecosystem Assessment;
- Health Impact Assessment; and
- Socio-Economic Impact Assessment.

❑ **Additional specialist studies** –

- Social Impact Assessment; and
- Quantitative Risk Assessment.

12.3 Incorporating the Findings from Specialist Studies

The information obtained from the respective specialist studies was incorporated into the EIA Report in the following manner:

❑ The assumptions and limitations identified in each study were included in Section 7 above;
❑ The information was used to complete the description of the receiving environment (Section 11) in a more detailed and site-specific manner;
❑ A summary of each specialist study is contained in the sub-sections to follow (Section 12.4 to Section 12.17 below), focusing on the approach to each study, key findings and conclusions drawn;
❑ The specialists' impacts assessments, and the identified mitigation measures, were included in the overall project impact assessment contained in Section 13 below;
❑ Specialist input was obtained to address comments made by I&APs that related to specific environmental features pertaining to each specialist discipline; and
❑ Salient recommendations made by the specialists were taken forward to the final EIA Conclusions in Section 15 below.

Refer to **Appendix E17** for declarations from the respective specialists.

12.4 Climate Change Impact Assessment

A summary of the Climate Change Impact Assessment (Promethium Carbon, 2026) follows. The specialist report is contained in **Appendix E1**.

12.4.1 Details of the Specialist

Various specialists from Promethium Carbon were involved in undertaking the Climate Change Impact Assessment. The details of the key specialist are provided below.

Organisation:	Promethium Carbon			
Name:	Robbie Louw	Shannon Murray	Camden Nauschutz	Kaylee van den Bosch
Qualifications:	BCom Hons (Econ) BSc Chem Eng	BA LLB	MSc Environmental Science	MSc Animal, Plant & Environmental Science

12.4.2 Objectives of the Study

This Climate Change Impact Assessment aims to achieve the following objectives:

- ❑ Determine the Project's contribution to climate change by:
  - Identifying Project activities and infrastructure contributing to greenhouse gas (GHG) emissions (notably from fuel combustion);
  - Compiling a GHG inventory for the Project across relevant lifecycle phases;
  - Assessing the Project's GHG emissions in relation to South Africa's national climate change policy framework and objectives, and international commitments; and
  - Identifying and proposing measures to mitigate the Project's emissions, where applicable.
- ❑ Determine the resilience of the Project to climate change by:
  - Assessing projected climate change risks and trends for the region;
  - Identifying vulnerabilities in the Project's core operations, value chain, and surrounding environmental and social systems; and
  - Recommending adaptation measures to enhance climate resilience.

12.4.3 Methodology

The methodology used for this Climate Change Impact Assessment was informed by:

- ❑ The nature of climate change;
- ❑ The development timeframes of the proposed Project;
- ❑ The long-term climate change impacts anticipated for the Project and surrounding areas; and
- ❑ Available climate data for variables specifically relevant to the Project.

This assessment considered the full lifecycle of the Project, from construction and operation through to decommissioning, and evaluated both the Project's contribution to climate through an emissions assessment and the potential impacts of projected climate change on the Project and its surrounding context. This assessment adopted a methodological approach that integrated climate policy context, climate risk assessment, and the use of spatially explicit climate and vulnerability data, in line with international best practice.

The assessment considered both the Project's contribution to climate change through GHG emissions and the potential effects of climate change on the Project over its life cycle. The methodology included the quantification of direct and indirect GHG emissions using internationally recognised accounting principles, an assessment of climate change risks and vulnerabilities associated with projected future climatic conditions, and an evaluation of the Project's alignment with applicable climate change policies and commitments. The assessment also considered cumulative impacts, alternatives, uncertainty, and opportunities for mitigation and adaptation.

A risk-based approach was applied to evaluate the significance of potential climate-related impacts and to identify appropriate measures to reduce emissions and enhance the Project's resilience to climate change.

12.4.4 Impact Assessment

Refer to Section 13.9 below for the results from the impact assessment from this study.

12.4.5 Opinions and Recommendations

Based on the findings of this Climate Change Impact Assessment, the following professional opinions are provided in relation to the proposed CCPP. These opinions consider the Project's exposure to climate-related physical risks, its quantified GHG emissions, and its relevance to the applicable national, provincial and municipal climate and energy policy context.

- **Climate-related physical risks and site context**:
  - The proposed CCPP is located within an established industrial area in Richards Bay, where the main climate-related risks include increasing temperatures, extreme rainfall, localised flooding, and disruption to upstream infrastructure and logistics during severe storm events. The Project site is not expected to be directly affected by sea-level rise over its operational life, although indirect exposure remains relevant through reliance on port and fuel-supply infrastructure. HILP events, including severe coastal storms, cut-off low systems with subtropical characteristics, and tropical cyclones, are also relevant in the regional context and may have disproportionate consequences despite their low probability. These risks are not considered, in themselves, to preclude the proposed development. The climate-related findings of this Climate Change Impact Assessment should, however, inform detailed design and operational resilience planning, particularly in relation to flood management, stormwater design, structural resilience, emergency preparedness, and business continuity for upstream supply-chain disruption.
- **Contribution to climate change**:
  - The proposed Project will result in a net increase in GHG emissions relative to the baseline and will make a cumulative contribution to atmospheric GHG concentrations over its life cycle. Although the selected combined cycle configuration is more efficient and less emissions-intensive per unit of electricity generated than simple-cycle gas turbines and conventional coal-fired generation, the Project remains a fossil-fuel-based development. The Climate Change Impact Assessment finds that the Project's contribution is relatively small, but not insignificant, in national terms.
  - The avoided-emissions scenarios included in the Climate Change Impact Assessment are illustrative and do not demonstrate guaranteed or directly attributable emission reductions. The Project's GHG emissions therefore remain a material consideration for decision-making.
- **Alignment with energy and climate policy**:
  - The proposed Project is relevant to the current electricity planning and procurement context in South Africa, including the procurement context for dispatchable gas-fired generation. However, the Climate Change Impact Assessment makes clear that this context is relevant, but not determinative. Alignment with planning or procurement instruments does not, in itself, predetermine whether EA should be granted. That

determination remains dependent on the Competent Authority's consideration of the Project's impacts, alternatives, GHG emissions, cumulative effects, and broader environmental acceptability in terms of NEMA.

Accordingly, it is the opinion of the Climate Change Impact Assessment specialists that there are no climate-related reasons, arising from this assessment alone, to oppose Environmental Authorisation for the proposed Richards Bay CCPP and associated infrastructure. The Project is considered suitable for consideration within the IDZ context, taking into account its role as dispatchable generation, its assessed physical climate risks, and its quantified contribution to global emissions.

12.5 Air Quality Impact Assessment

A summary of the Air Quality Impact Assessment (uMoya-NILU, 2026) follows. The specialist report is contained in **Appendix E2**.

12.5.1 Details of the Specialist

The details of the specialists that undertook the Air Quality Impact Assessment follow.

Organisation:	uMoya-NILU	
Name:	Dr Mark Zunckel	Atham Raghunandan
Qualifications:	National Diploma (Meteorology) BSc (Meteorology) MSc and PHD	M.A. (Atmospheric Sciences)
Affiliation (if applicable):	• South African Council for Natural Scientific Professions (SACNASP) Professional Natural Scientist (Pr.Sci.Nat.) (reg. no.: 400449/04) • National Association for Clean Air	• National Association for Clean Air • South African Society for Atmospheric Sciences

12.5.2 Terms of Reference for the Study

The Terms of Reference for the Air Quality Impact Assessment included the following:

- ❑ Prepare a SSV report relating to air quality and based on findings of DFFE Screening Tool (included in the Scoping Report). Identify sensitive receptors and utilise available ambient air quality monitoring data.
- ❑ Prepare a Model Plan of Study report providing an overview of the air quality assessment approach, including inputs, modelling methodology and assessment methodology and submit to the Licensing Authority for approval. This is in accordance with to the DEA guideline for dispersion modelling. The Licensing Authority in the case of power generation is the National Air Quality Officer.
- ❑ Use available data and information to describe the current state of the receiving atmospheric environment in Richards Bay, including ambient air quality and meteorological data.

- Work with the Applicant and EAP to characterise the atmospheric emissions resulting from construction and operations of the proposed power plant, including particulate matter (PM_{10} and $PM_{2.5}$), sulphur dioxide (SO_2), oxides of nitrogen (NO_X), carbon monoxide (CO) and volatile organic compounds (VOC).
- Predict ambient concentrations of the air pollutants resulting from the construction and operational phases of the proposed power plant using the DEA recommended CALPUFF dispersion model and according to the DEA guideline for dispersion modelling.
- Assess the potential impact of the emissions of the proposed power plant on ambient air quality using the predicted (modelled) ambient concentrations and the health-based NAAQS.
- Predict the cumulative effect of the air pollutants resulting from the operational phase of the power plant with the contribution of existing major industrial sources using the DEA recommended CALPUFF dispersion model and according to the DEA guideline for dispersion modelling.
- Assess quantitively the cumulative effect of the air pollutants resulting from the operational phase of the proposed power plant with the contribution of existing major industrial sources and future (approved) gas-to-power projects in Richards Bay.
- Prepare and submit the draft AIR to the EAP for review with the Applicant.
- Respond to any comments that may be raised on the AIR during the S&EIR Process by authorities or I&APs.
- Finalise the AIR following comments received.

12.5.3 Methodology

The following key steps were included in the approach:

- Existing ambient air quality and meteorological data were reviewed to establish baseline conditions and identify sensitive receptors in the study area;
- Emissions from the proposed gas turbines and associated plant components were quantified using plant design specifications and applicable MES;
- Meteorological data were processed to characterise local atmospheric conditions influencing pollutant dispersion;
- Atmospheric dispersion modelling was undertaken to predict ground-level pollutant concentrations under various operational scenarios;
- Various scenarios were modelled;
- Predicted concentrations were compared against the NAAQS to determine potential air quality impacts; and
- Air quality impacts were assessed.

12.5.4 Key Findings of the Study

12.5.4.1 Air Pollutants Resulting from the Process

The quantity and nature of emissions to the atmosphere from LNG combustion depends on the quality of the fuel, fuel consumption, the combustion device, and the air pollution control devices.

The combustion of LNG results in gaseous emissions of sulphur dioxide (SO_2), oxides of nitrogen (NO + NO_2 = NO_X), carbon monoxide (CO), and some particulate matter (PM). SO_2 is produced from the combustion of sulphur in the LNG. NO_X is produced from thermal fixation of atmospheric nitrogen in the combustion flame and from oxidation of nitrogen bound in the LNG. The quantity of NO_x produced is directly proportional to the temperature of the flame. The non-combustible portion of the fuel remains as solid waste and emitted as PM.

Carbon dioxide (CO_2) is the main greenhouse gas resulting from LNG combustion. It is not considered in this AIR.

The path of exposure to air pollutants is inhalation, although some exposure may occur through dermal contact with surfaces where air pollutants settle. The AIR provides a short literature review of air pollutants from an air quality and human health perspective.

12.5.4.2 Point Source Maximum Emission Rates (Normal Operating Conditions)

The two gas Combustion Turbines will each have a single stack, and the two HRSGs will also each have a single stack.

The Plant must comply with the MES for gas-fired power plants. For this assessment the MES are assumed for normal operations. This assumption is a worst-case scenario. The emission rates from the point source (stack) are presented in Table 50.

Table 50: MES for Sub-category 1.4, stack emission concentrations (mg/Nm^3) and emission rates (tonnes/annum) (uMoya-NILU, 2026)

Source name	MES	Emission rates			
		Gas Turbine 1 Stack	Gas Turbine 2 Stack	HGST 1 Stack	HGST 2 Stack
SO_2	400	5 900	5 900	7 195	7 195
NO_X	50	737.5	737.5	899.3	899.3
PM_{10}	10	147.5	147.5	179.9	179.9
CO*	N/A	303	303	303	303

* CO emission data provided by Technical Team

The annual emissions presented above assume that operations are continuous, i.e. 24 hours per day for 365 days. This is a worst-case assumption as operations are likely to be for a few hours per day, during emergency situations, which is mainly during loadshedding or in the event of power failures.

12.5.4.3 Dispersion Modelling

The CALPUFF dispersion model was used to predict ambient concentrations of SO_2, NO_2, PM_{10} and CO resulting from the proposed Mabasa CCPP emissions. Modelling was done according to the modelling regulations and 3-years of hourly surface and upper air meteorological data.

To assess the potential impacts of the proposed Mabasa CCPP on ambient air quality, the following four operational scenarios were assessed quantitatively using dispersion modelling:

- Scenario 1: Mabasa CCPP in simple cycle mode (using Combustion Turbines to generate 500 MW of electricity) and in isolation of other sources;
- Scenario 2: Mabasa CCPP in combined-cycle mode (using Combustion Turbines and HRSGs to generate 750 MW of electricity) and in isolation of other sources;
- Scenario 3: Cumulative - Mabasa CCPP in combined-cycle mode with the contribution of existing industrial sources; and
- Scenario 4: Cumulative - Mabasa CCPP in combined-cycle mode with the contribution of industrial sources and approved future facilities.

The following three scenarios were assed qualitatively:

- Emergency Shutdown
- Black-start scenario
- Backup diesel operation

For the Mabasa CCPP operating in Single and Combined Cycle modes the maximum predicted annual SO_2, NO_2, PM_{10} and CO concentrations and the 99th percentile concentrations of the 24-hour, 8-hour and 1-hour predicted concentrations are very low relative to the NAAQS (see Table 51 below). The predicted ambient concentrations for the Combined Cycle mode are slightly higher than for Single Cycle mode. For the cumulative assessments, exceedances are predicted for the 99th percentile concentrations of the 24-hour, 8-hour and 1-hour predicted concentrations. Approved projects add slightly to the predicted ambient concentrations resulting from industry.

Table 51: Maximum predicted ambient annual SO_2, NO_2, PM_{10} and CO concentrations in µg/m^3 and the predicted 99th percentile concentrations for 24-hour, 8-hour and 1-hour averaging periods, with the South African NAAQS (uMoya-NILU, 2026)

Description	Scenario	Pollutant and averaging period			
		Annual	24-hour	8-hour	1-hour
		SO_2			
Predicted maximum SO_2	Scenario 1	1.12	14.0	-	40.8
	Scenario 2	4.23	37.3	-	110
	Scenario 3	52.5	243	-	682
	Scenario 4	59.2	315	-	695
NAAQS		**50**	**125**	**-**	**350**
		NO_2			
Predicted maximum NO_2	Scenario 1	0.11	-	-	4.08
	Scenario 2	0.42	-	-	11
	Scenario 3	21.2	-	-	273
	Scenario 4	21.9	-	-	273
NAAQS		**40**	**-**	**-**	**200**
		PM_{10}			
Predicted maximum PM_{10}	Scenario 1	0.03	0.35		
	Scenario 2	0.11	0.93		

Description	Scenario	Pollutant and averaging period			
		Annual	24-hour	8-hour	1-hour
	Scenario 3	26.8	189		
	Scenario 4	27.2	189		
NAAQS		**40**	**75**		
		CO			
Predicted maximum CO	Scenario 1	-	-	1.51	3.09
	Scenario 2	-	-	4.64	3.26
	Scenario 3	-	-	-	-
	Scenario 4	-	-	-	-
NAAQS				**10 000**	**30 000**

12.5.4.4 Impact Assessment

The impact assessment was assessed for cumulative impacts of the proposed Mabasa CCPP with existing pollution sources. The following points are noteworthy:

- Monitoring data for 2021-2025 has shown that ambient SO_2 concentrations are low in Richards Bay, with occasional exceedances of the 1-hour NAAQS. The additive effect of the contribution of SO_2 from the proposed Mabasa CCPP is predicted to be very small and the potential increase in ambient SO_2 concentrations is highly unlikely to result in elevated concentrations or further exceedances of the NAAQS.
- Monitoring data for is not available for NO_2 in Richards Bay. Despite this, the additive effect of the contribution of NO_2 from the proposed Mabasa CCPP is predicted to be very small and the potential increase in ambient NO_2 concentrations is highly unlikely to result in elevated concentrations or further exceedances of the NAAQS.
- Monitoring data for 2021-2024 has shown that ambient PM_{10} concentrations are relatively high in Richards Bay because of high regional background concentrations, with one exceedance of the 24-hour NAAQS. The additive effect of the contribution of PM_{10} from the proposed Mabasa CCPP is predicted to be very small and the potential increase in ambient PM_{10} concentrations is highly unlikely to result in elevated concentrations or further exceedances of the NAAQS.
- Monitoring data is not available for CO in Richards Bay. Despite this, the additive effect of the contribution of CO from the proposed Mabasa CCPP is predicted to be very small and the potential increase in ambient CO concentrations is highly unlikely to result in elevated concentrations or further exceedances of the NAAQS.

Besides the proposed Mabasa CCPP Project, it is reasonable to expect that other power generation projects may operate in Richards Bay in the future. It is therefore relevant to assess the potential cumulative effects of such projects on ambient air quality in Richards Bay together with the proposed Mabasa CCPP Project. Six potential power generation projects have been identified for the assessment of these cumulative impacts:

- Elegant Afro Chemicals Chlor-Alkali Plant in the RBIDZ;
- Eskom 3000 MW CCPP in the RBIDZ;
- Nseleni Power Corporation Limited Floating CCPP in the Port of Richards Bay;
- Nyanza Light Metals Titanium Dioxide Pigment Plant in the RBIDZ;
- Phakwe Richards Bay Gas 3 CCPP in the RBIDZ; and

- Phinda Richards Bay 320 MW gas PP in Alton industrial.

Dust emissions were not estimated for the construction and decommissioning/closure phase as they require specific information on the nature and duration of the activities as well as the equipment and vehicles. The assessment of air quality impacts during the construction and decommissioning/closure phase is therefore qualitative. The findings for both phases are similar.

- Dust generated in both phases are generally coarse and impacts manifest as a nuisance rather than a health issue.
- The magnitude of the impact is considered to be low.
- Activities are likely to endure for a maximum of 6-12 months and impacts may only occur during this period. The duration is therefore short-term.
- Dust emissions are released close to ground level with little or no buoyancy. This implies that their dispersion is limited, and the extent of potential impacts will be limited to the proposed site.
- There is a low probability of potential impacts occurring as a result of the activities.
- The significance of the impact for the construction and decommissioning/closure phase on air quality is low (negative).

A summary of the Air Quality Impact Assessment is presented in Section 12.5 below in terms of consequence, likelihood or probability and significance.

For Scenarios 1 and 2, emissions from the proposed Mabasa CCPP operating in Simple and Combined cycle modes predicted ambient SO_2, NO_2, PM_{10} and CO concentrations are low. The predicted ambient concentrations for the Combined Cycle mode are somewhat higher than for Simple Cycle mode. The associated impact for both scenarios is low.

For Scenarios 3, emissions from the proposed Mabasa CCPP operating in Combined Cycle mode with the contribution of other industries. This is a hypothetical case for two reasons. One, the suite of industries generally operates below the permitted maximum emissions, and two, it is unlikely, but not impossible, that the suite of industries simultaneously emits at the permitted maximum concentration. Using the permitted maximum emissions rather than actual emissions therefore present a possible worst-case scenario. The predicted ambient SO_2, NO_2 and PM_{10} concentrations exceed the NAAQS, and the cumulative assessments of other industries with the Mabasa CCPP are predicted to be medium. A medium rating is applied considering the hypothetical nature of the emissions used. Note that the relative contribution from the Mabasa CCPP to this scenario is low.

For Scenarios 4, emissions from the proposed Mabasa CCPP operating in Combined Cycle mode with the contribution of other industries and approved projects, the predicted ambient SO_2, NO_2 and PM_{10} concentrations exceed the NAAQS. This is also a hypothetical case for a few reasons. Firstly, the suite of industries generally operates below the permitted maximum emissions. Secondly, the approved projects are natural gas projects and will operate well below the MES for SO_2 and particulates due to the nature of natural gas. Lastly, but not impossible that the suite of industries

simultaneously emits at the permitted maximum concentration. Using the permitted maximum emissions rather than actual emissions therefore present a possible worst-case scenario. The predicted ambient concentrations for Scenario 4 are somewhat higher than for Scenario 3. In other words, the collective of the approved projects has a relatively small additive effect to industries assessed. The cumulative assessments of other industries and approved projects with the Mabasa CCPP is predicted to be medium. A medium rating is applied considering the hypothetical nature of the emissions used. Note that the relative contribution from the Mabasa CCPP to this scenario is low.

Three additional operating scenarios were assessed qualitatively, namely emergency shutdown, black-start and backup diesel operation. These scenarios involve the use of ULSD for relatively short and infrequent periods, with backup diesel operation representing a contingency measure in the event of a natural gas supply interruption. While these scenarios would result in temporary atmospheric emissions, their infrequent occurrence and limited duration are expected to constrain their potential impact on ambient air quality. The associated air quality impacts are therefore considered to be of low significance.

Natural gas is clean fuel containing very low sulphur and has a very low particulate content. Air quality management interventions in the form of the control of emission have been considered in all aspects of design and operation for the Mabasa CCPP. Apart from Dry Low-NOx burners to control NO_X emissions, further emission reduction interventions are deemed to be unnecessary considering the low impact of the proposed project on air quality. From an air quality perspective, it is the reasonable opinion of the authors that the proposed Mabasa CCPP should be authorised considering the findings of this AIR.

12.5.4.5 Conclusions

Air quality management interventions in the form of the control of emission have been considered in all aspects of design and operation for the Mabasa CCPP. Further emission reduction interventions are deemed to be unnecessary considering the low impact of the proposed project on air quality. From an air quality perspective, it is the reasonable opinion of the authors that the proposed Mabasa CCPP should be authorised considering the findings of this AIR.

The cumulative assessment of the Mabasa CCPP with other industrial sources and with future sources raises an important flag for air quality management in Richards Bay. These hypothetical assessments demonstrate that ambient air quality in Richards Bay can be significantly affected if the industrial facilities simultaneously operate at their maximum permitted emissions, or generate electricity with fuel other than Natural Gas.

12.6 Freshwater Ecosystem Assessment

A summary of the Freshwater Ecosystem Assessment (SAS, 2026) follows. The specialist report is contained in **Appendix E3**.

12.6.1 Details of the Specialist

The details of the specialists that undertook the Freshwater Ecosystem Assessment follow.

Organisation:	Scientific Aquatic Services (SAS)	
Name:	Stephen van Staden	Nqobile Lushozi
Qualifications:	MSc Environmental Management	MSc Geoinformatics
Affiliation (if applicable):	SACNASP Pr.Sci.Nat. (reg. no.: 400134/05)	SACNASP (reg. no.: 124679)

12.6.2 Scope of Work

The scope of work for the Freshwater Ecosystem Assessment included the following:

- A background study of relevant national, provincial and municipal datasets (such as the National Freshwater Ecosystem Priority Areas [NFEPA] 2011 database; the DWS Research Quality Information Services (2014) database, National Biodiversity Assessment (NBA) (2018), and the Guideline: Biodiversity Impact Assessment in KwaZulu-Natal (EKZNW, 2013 as cited in SAS, 2026), were undertaken to aid in defining the Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS) of the freshwater ecosystems.
- All freshwater ecosystems within the investigation area were delineated using desktop methods in accordance with GN 4167 of December 2023 as it relates to activities as stipulated in the NWA and verified where possible according to the “Department of Water Affairs and Forestry (DWAF) (2005): A practical field procedure for identification of wetlands and riparian areas”. Aspects such as soil morphological characteristics, vegetation types and wetness were used to verify the freshwater ecosystems.
- The freshwater ecosystem classification assessment was undertaken according to the Classification System for Wetlands and other Aquatic Ecosystems in South Africa. User Manual: Inland systems (Ollis *et al*., 2013 as cited in SAS, 2026).
- The EIS of the freshwater ecosystem was determined according to the method described by Rountree and Kotze (2013) (as cited in SAS, 2026).
- The PES of the freshwater ecosystems was assessed according to the resource directed measures guideline as advocated by Macfarlane *et al*., (2008) (as cited in SAS, 2026).
- The freshwater ecosystems were mapped according to the hydrogeomorphic units in relation to the proposed Project. In addition to the freshwater ecosystem boundaries, the appropriate provincial recommended buffers and legislated zones of regulation were depicted where applicable.

- A suitable Recommended Management Objective (RMO), Recommended Ecological Class (REC), and Best Attainable State (BAS) were allocated to the freshwater ecosystems based on the results obtained from the PES and EIS assessments.
- Management and mitigation measures were identified to manage impacts to freshwater ecosystems.

12.6.3 Key Findings of the Study

The freshwater ecosystems in the project area were initially delineated using desktop methods (use of aerial photographs, digital satellite imagery and topographical maps), and refined in the field by ground-truthing the desktop delineation at certain pre-selected points. The delineations as presented in this report are thus regarded as a best estimate of the freshwater habitat boundaries based on the site conditions present at the time of assessment.

The following indicators were used to delineate the boundaries of the temporary zones associated with the identified freshwater ecosystems:

- Terrain units were used as the primary indicator. Despite transformation of the landscape associated with the study area, the terrain provided an indication of low-lying areas where water is likely to collect and/or move through the landscape and areas in the landscape where seep wetlands could potentially be expected to occur;
- Vegetation was utilised in conjunction with terrain as the secondary indicator, where feasible. Due to the extensive transformation due to historical activities, it was worth noting that the vegetation indicator was not always reliable, especially in areas that have undergone proliferation of alien invasive plants (AIP's), where vegetation has been extensively cleared and where a wet response has been due to significant rainfall which took place days prior to the sampling time;
- The soil wetness indicator, duration and frequency of saturation in the soil profile provides a diagnostic indicator since it influences the colour change in the soil. Low chroma (grey and muted colours) as well as mottles are more prominent in soil which is associated with fluctuating water table; and
- Similarly, the soil morphological characteristic indicator was also utilised especially in areas where no significant disturbance of soil has taken place. In unimpacted sites, the soil morphological characteristics typically associated with wetland conditions display gleying or mottling.

During the assessment, two wetlands were delineated within the study area, namely a seep wetland and wetland flat. These identified wetlands are shown in Figure 77 below. The result of the ecological assessment of these wetlands is summarised in Table 52 below.

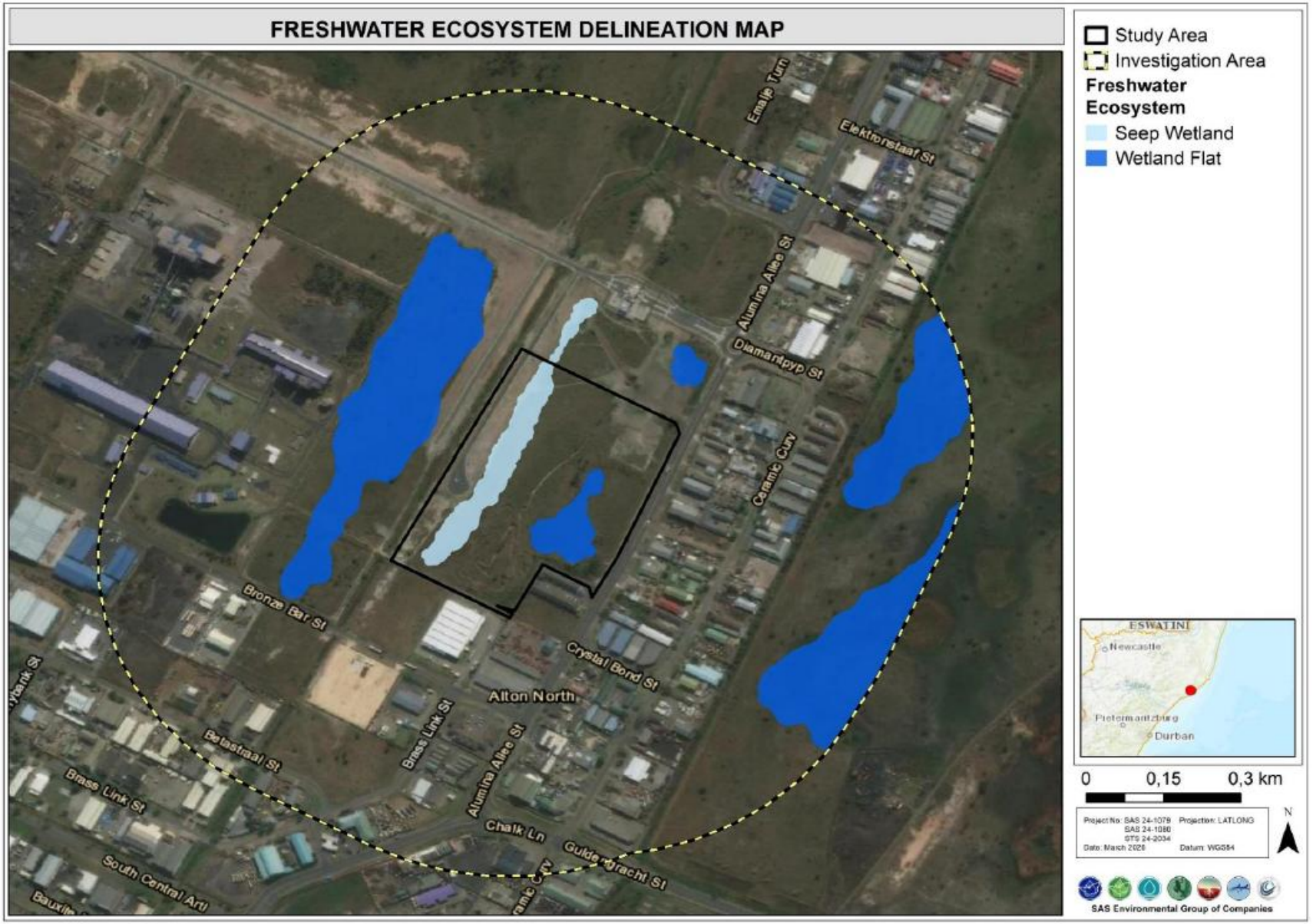


Figure 77: Delineated wetlands (SAS, 2026)

Table 52: Summary of ecological assessment of delineated wetlands

Freshwater Ecosystem	PES / Ecostatus	Ecoservices	EIS	REC / RMO / BAS
Seep Wetland	Category C (Moderately Modified)	Moderate	Intermediate	REC Category: C BAS Category: C RMO: Maintain
Wetland flat	Category C (Moderately Modified)	Moderate	Intermediate	REC Category: C BAS Category: C RMO: Maintain
Extent of modification anticipated to the seep wetland and wetland flat	**High** The extent of modification to the seep wetland was considered to be high given that the seep wetland within the study area will be completely lost due to infilling. This will result in a complete loss of ecological functioning for these wetlands.			

An EA (Ref: 14/12/16/3/3/2/665) and associated Water Use Authorisation were previously granted for RBIDZ Phase 1F, which included the infilling of wetlands and the development of service infrastructure to support industrial development within the study area. As these activities have already been authorised and are not being reapplied for as part of the current application, the DWS Risk Assessment Matrix (2023) was not applied as no additional significant quantum of risk to the adjacent wetlands is deemed likely as a result of the proposed development.

While the loss of wetlands within the authorised development footprint is therefore acknowledged, it remains essential that construction activities are undertaken in accordance with best practice and environmental management measures to minimise further impacts.

12.7 Terrestrial Biodiversity Assessment

Summaries of the Terrestrial Biodiversity Assessment (STS, 2026a) (contained in **Appendix E4**), Floral Assessment (STS, 2026b) (contained in **Appendix E5**), and Faunal Assessment (STS, 2026c) (contained in **Appendix E6**) follow.

12.7.1 Details of the Specialist

The details of the specialist that undertook the Terrestrial Biodiversity Assessment, Floral Assessment and Faunal Assessment follow.

Organisation:	Scientific Terrestrial Services (STS)			
Name:	Stephen van Staden	Samantha Leigh Daniels	Jandre Potgieter	Justin Jacobs
Qualifications:	MSc Environmental Management	PhD Plant Science	BSc (Hons) Entomology	BSc (Hons) Entomology
Affiliation (if applicable):	SACNASP Pr.Sci.Nat. (reg. no.: 400134/05)	SACNASP	SACNASP (reg. no.: 170165/24)	

12.7.2 Structure of the Report

Part A serves to introduce the study area, as well as the general approach to the study. Part A also presents the results of general desktop information reviewed as part of the study, including the

information generated by the relevant authorities, as well as the context of the site in relation to the surrounding anthropogenic activities and ecological character.

Part B presents the results of the **floral field assessment**, data analyses and discussion of the results. Part B then presents the results of the impact assessment, where the impacts on floral ecology and biodiversity are discussed.

Part C presents the results of the **faunal field assessment**, data analyses and discussion of the results. Part C then presents the results of the impact assessment, where the impacts on faunal ecology and biodiversity are discussed.

12.7.3 Scope of Work

The scope of work for the Terrestrial Biodiversity Assessment included the following:

- To update the desktop assessment using all relevant information as presented by the South African National Biodiversity Institute's (SANBI) Biodiversity Geographic Information Systems (BGIS) website (http://bgis.sanbi.org) and the DFFE Environmental Geographical Information Systems (E-GIS) website (https://egis.environment.gov.za/). The desktop assessment aims to gain background information on the physical habitat and potential floral and faunal ecology associated with the study area;
- To state the indemnity and terms of use of this report as well as to provide the details of the specialists who prepared the reports;
- To outline the legislative requirements that were considered for the assessment;
- To provide a Site Sensitivity Verification to outline the type of reporting requirements needed for specialist reports applicable to the EIA; and
- To provide the methodologies followed relating to the impact assessment and development of the mitigation measures that were applied in the floral and faunal assessments.

12.7.4 Methodology

12.7.4.1 Floral Assessment

Before conducting the field assessment, a desktop study was performed to gather background information regarding the study area, including the surrounding areas (presented in Part A of the overall report). This involved consulting maps, aerial photographs, and digital satellite images to determine broad habitats and potential sensitive areas. A literature review of the habitats, vegetation types, and distributions of floral species within and surrounding the study area was undertaken, while also considering the threat status of the ecosystem(s) in the study area. The conservation requirements and biodiversity goals, at national and provincial levels, of the biodiversity features associated with the study area were also considered.

Following the desktop assessment and literature review, a field assessment was undertaken to confirm the presence of potentially sensitive habitats and to compile floral species inventories for

each habitat type identified within the study area. The developed species lists include potential floral SCC and alien floral species. The floral assessment took place in June 2024. The specialist walked several meanderings during the field assessment, surveying various plant species and recording the habitat conditions.

All botanical features within the study area, including vegetation units and/or habitat types, as well as notable plant species distributions (where applicable), were assessed, and areas of increased sensitivity or conservation value were delineated

Habitat types were assigned Site Ecological Importance (SEI) categories (SANBI, 2020 as cited in STS, 2026b) based on their functional integrity, conservation value, the presence of SCCs, and their resilience to disturbance. The resulting habitat sensitivities were overlaid with the proposed development footprints (where layouts are available) to identify potential conflict areas.

Lastly, an assessment of the presence of any floral SCCs, as well as suitable habitat to support any such species, was undertaken.

12.7.4.2 Faunal Assessment

The approach to the faunal assessment included the following:

- Maps and digital satellite images were consulted prior to the field assessment to determine broad habitats, vegetation types and potentially sensitive sites. An initial visual on-site assessment of the study area was made in order to confirm the assumptions made during consultation of the digital satellite imagery.
- A literature review with respect to habitats, vegetation types and species distribution was conducted considering the larger study area.
- Relevant databases considered during the assessment of the study area included online verified research grade species records from iNaturalist; The Endangered Wildlife Trust Red List of Species (EWT, 2025), the SANBI South African Red List of Species (2021), Regional Red Data Book of Birds of South Africa, Lesotho, and Eswatini (Lee *et al*., 2025), Important Bird and Biodiversity Areas (IBA, 2015), South African Bird Atlas Project 2 (SABAP2), International Union for Conservation of Nature (IUCN), the Screening Tool (2025) and the National Biodiversity Assessment (NBA, 2018) (all cited in STS, 2026c).
- All the ecological features associated with the study area were considered and sensitive areas were delineated.
- The various habitat types were assigned SEI categories based on their ecological integrity, conservation value, the presence of SCC and their ecosystem processes.
- During field assessments, it is not always feasible to identify or observe all species within an area, largely due to the secretive nature of many faunal species, possible low population numbers or varying habits of species. As such, and to specifically assess an area for faunal SCC, a POC estimation is used, considering several factors to determine the probability of faunal SCC occurrence within the study area. Species whose known distribution ranges and habitat preferences include the proposed development site were taken into consideration.

Faunal species likely to occur within the study area are indicated and briefly discussed within each of the relevant dashboards, along with their POC.

12.7.5 Key Findings of the Study

12.7.5.1 Terrestrial Biodiversity Assessment

The site sensitivity verification field assessment was undertaken in June 2024. The study area comprises a mosaic of habitat units that have been subjected to varying degrees of anthropogenic disturbance over time, including vegetation clearing, mowing, and surrounding industrial development. Four primary habitat units were identified, namely Degraded Hygrophilous Grassland, Thicket Habitat, Freshwater Habitat (wetland flats and seep systems), and Transformed Habitat.

The Degraded Hygrophilous Grassland represents the dominant habitat unit and is characterised by a relatively homogeneous herbaceous layer with moderate to low species richness, indicative of disturbance. The Thicket Habitat, located in the southern portion of the site, comprises a dense assemblage of woody species but lacks structural complexity associated with intact forest systems and supports a moderately low diversity of species. The Freshwater Habitat, occurring in the eastern and western portions of the study area, is associated with wetland features and supports comparatively higher ecological functionality, although species diversity varies across these systems. The Transformed Habitat, associated with existing road infrastructure, is highly degraded, with negligible ecological function and limited vegetation cover dominated by scattered AIP species.

AIP species were observed across portions of the study area, particularly within disturbed habitats, although overall abundance was relatively low. Historical and ongoing disturbance, together with surrounding industrial land use and the presence of physical barriers (e.g., fencing), have contributed to habitat fragmentation and reduced ecological connectivity.

From a floral perspective, no threatened species (Red Data Listed or TOPS-listed) or protected tree species (as per the National Forests Act [Act No. 84 of 1998] [NFA]) were recorded during the site assessment. However, suitable habitat is present within the freshwater systems for certain triggered species, and a moderate probability of occurrence (POC) is therefore assigned. A precautionary approach is thus warranted.

Faunal diversity within the study area was generally low relative to expected regional assemblages, likely due to habitat fragmentation and disturbance. Mammal presence was largely limited to common species, with evidence of species such as *Thryonomys swinderianus* (Greater Cane Rat). Avifaunal diversity was highest within the Freshwater and Thicket Habitats, while lower diversity was associated with the Degraded Hygrophilous Grassland and Transformed Habitat. No faunal species of conservation concern (SCC) were confirmed during the assessment, although suitable habitat for certain species may occur within the Freshwater Habitat.

Herpetofaunal and invertebrate diversity were also considered low to moderate, with seasonal limitations (winter survey) likely influencing detectability.

The very high terrestrial biodiversity sensitivity identified by the Screening Tool is primarily driven by the presence of an irreplaceable CBA, associated with the Maputaland Wooded Grassland ecosystem (Endangered), as well as Priority Focus Areas identified in the NPAES. Based on field verification, sections of the study area, particularly the Freshwater Habitat, are considered to be representative of this ecosystem, and the CBA designation is therefore confirmed in part to sections of the study area.

Overall, while portions of the study area retain moderate ecological value, particularly within freshwater-associated habitats, the site is characterised by disturbance, fragmentation, and reduced connectivity. As such, the ecological sensitivity is considered to be moderate at a local scale, with higher sensitivity associated with the freshwater components and lower sensitivity associated with transformed and degraded habitats (e.g., Degraded Hygrophilous Grassland and Transformed Habitat). Photographs and a map of the habitat types identified during the assessment are shown in Figure 78 and Figure 79 below, respectively.

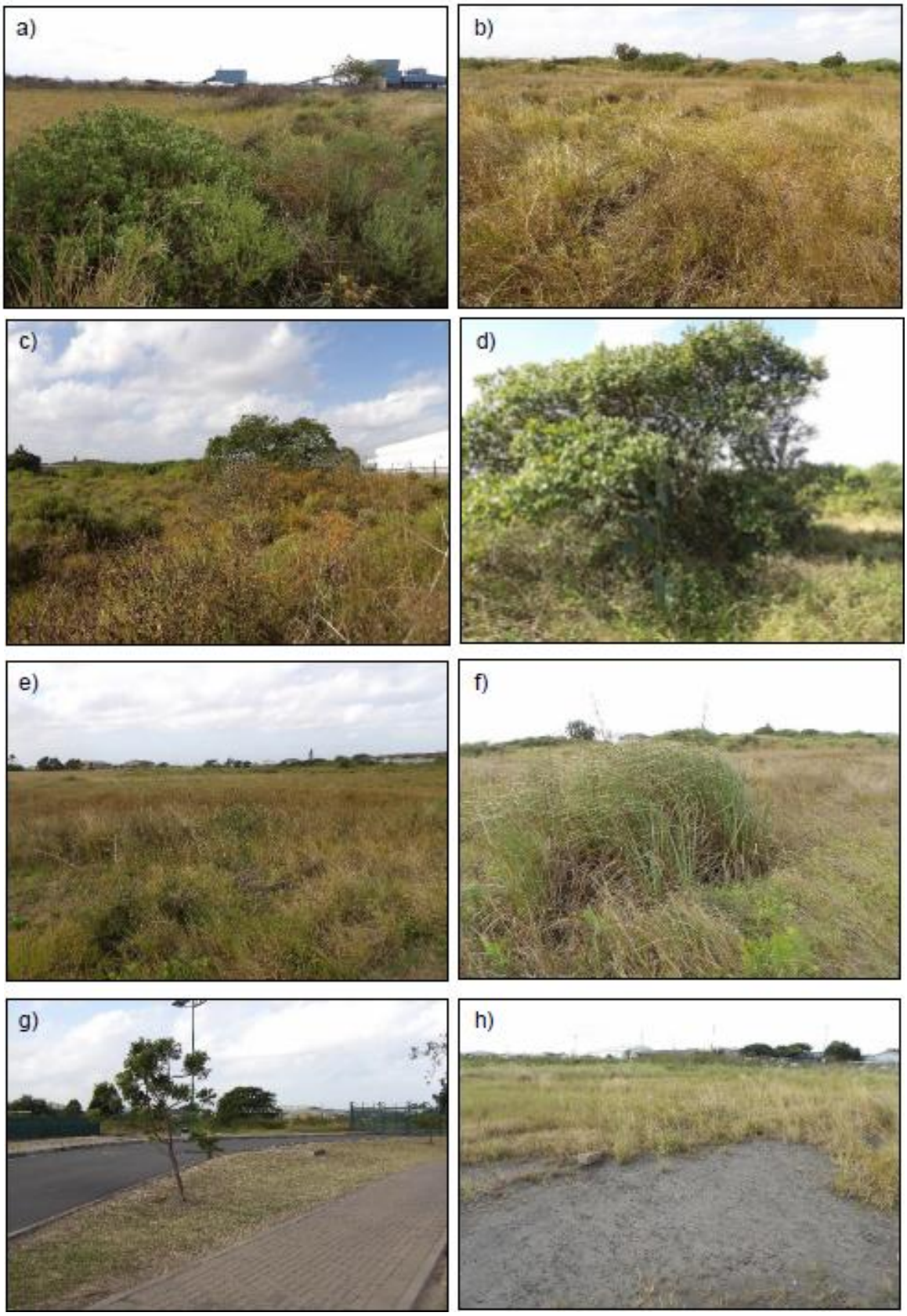


Figure 78: Representative photographs of the habitat types observed within the study area, namely: Hygrophilous Grassland Habitat (a-b), Thicket Habitat (c-d), Freshwater Habitat (e-f) and Transformed Habitat (g-h) (STS, 2026a)

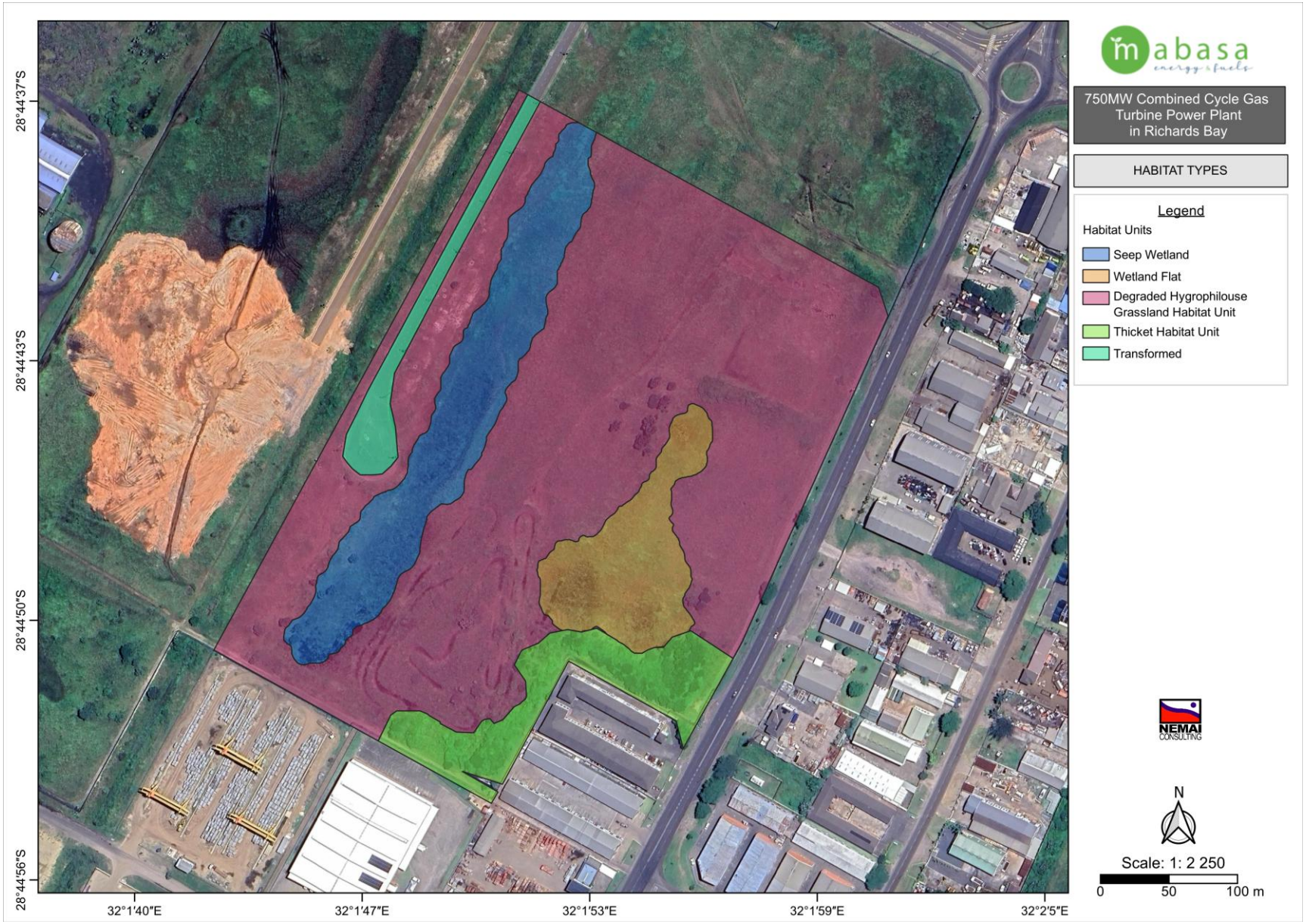


Figure 79: Habitat types identified during assessment

12.7.5.2 Floral Assessment

Biodiversity Priority Areas/Conservation Significance

The biodiversity importance and conservation significance of the study area are informed by the Terrestrial Biodiversity Theme of the Screening Tool, together with supporting provincial and national spatial datasets reviewed in Part A of the overall report and verified through SSV.

At a regional and national scale, the study area is located within the Maputaland Wooded Grassland vegetation type, which is classified as Endangered, reflecting extensive historical transformation and ongoing pressures from land use and AIP invasion. Provincial conservation planning datasets further indicate that the broader area includes both threatened terrestrial ecosystems and vulnerable freshwater ecosystem components. In addition, the study area occurs within a landscape identified as important for conservation planning and expansion and is situated in proximity to protected areas and an Important Bird Area (IBA).

While the Screening Tool and associated datasets indicate that portions of the study area fall within a CBA classified as Irreplaceable, this designation is primarily associated with freshwater features, which are excluded from the current assessment due to existing authorisation for their infilling. As such, no CBA habitat is confirmed within the terrestrial components of the study area.

Despite this high conservation context at a regional scale, field verification indicates that the study area has been subject to varying degrees of historical disturbance. This is reflected in the presence of transformed areas, degraded vegetation, and the proliferation of AIP species across several habitat units. As such, while portions of the site retain limited affinity to the reference Endangered vegetation type, the ecological condition is variable and generally lower than that of intact examples of Maputaland Wooded Grassland.

Overall, the study area is located within a region of high conservation importance at a planning scale; however, at a site level, the terrestrial habitats are degraded and not representative of intact Endangered vegetation or functional CBA habitat. The conservation significance of the terrestrial component is therefore considered to be moderate at a local scale, driven primarily by its location within a broader sensitive landscape rather than intrinsic habitat quality.

Site Ecological Importance & Areas of Concern

All habitats within the study area were allocated an importance category, i.e., SEI category. SEI is a function of the biodiversity importance (BI) of the receptor and receptor resilience (RR). BI, in turn, is a function of conservation importance (CI) and the functional integrity (FI) of the receptor. For an SEI of “Very High” and “High”, avoidance mitigation is recommended. Table 53 indicates the individual SEI scoring for each habitat unit/receptor based on the floral assessment. Figure 80 shows the floral SEI for the study area.

Table 53: Floral SEI for the different habitat units in the study area (STS, 2026b)

Habitat Unit	CI	FI	BI	RR	SEI
Transformed Habitat	**Very Low** No confirmed and highly unlikely populations of SCC. No confirmed and highly unlikely populations of range-restricted species. No natural habitat remaining.	**Very Low** Very small area. No habitat connectivity except for flora with wind-dispersed seeds. Several major current negative ecological impacts.	Very Low	**Very High** Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of returning to a site once the disturbance or impact has been removed.	Very Low
Degraded Hygrophilous Grasslands	**Low** No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species. < 50% of receptor contains natural habitat with limited potential to support SCC.	**Low** Several minor and major current negative ecological impacts.	Low	**Medium** Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a moderate likelihood of returning to a site once the disturbance or impact has been removed.	Low
Thicket Habitat	**Medium** Confirmed or highly likely occurrence of populations of NT species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals. Specifically, Sensitive species 1252 (Status = VU (criterion A). POC = High).	**Medium** Only narrow corridors of good habitat connectivity. Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	Medium	**Medium** Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a moderate likelihood of returning to a site once the disturbance or impact has been removed.	Medium
Freshwater-Associated Habitat	**High** Confirmed or highly likely occurrence of IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A, namely: *Fimbristylis aphylla* (Status = VU (criterion B). POC = High).	**High** Good habitat connectivity with potentially functional ecological corridors and a regularly used road network between intact habitat patches. Only minor current negative ecological impacts with no signs of major past disturbance and good rehabilitation potential.	High	**Very Low** Habitat that is unable to recover from major impacts, or species that are unlikely to remain at a site even when a disturbance or impact is occurring, or species that are unlikely to return to a site once the disturbance or impact has been removed.	High

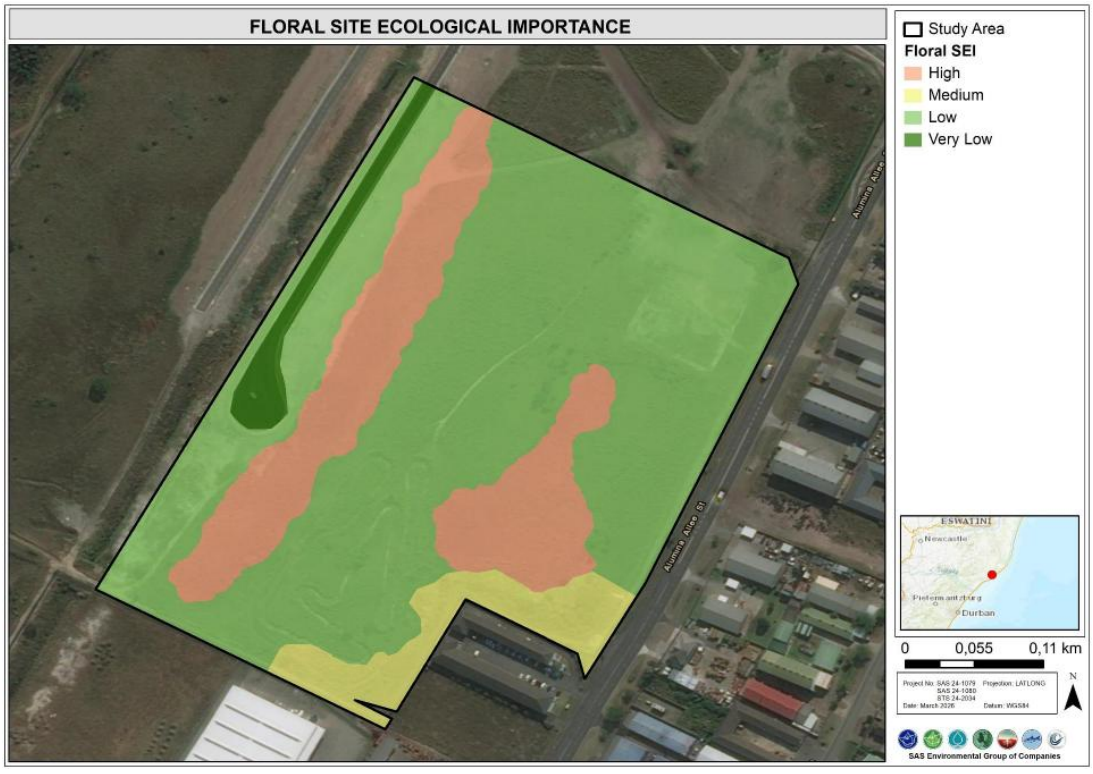


Figure 80: Floral SEI for identified habitat types (STS, 2026b)

12.7.5.3 Faunal Assessment

Table 54 below indicates the individual SEI scoring for each habitat unit based on the faunal assessment. Figure 81 shows the faunal SEI for the study area.

Table 54: Faunal SEI for the different habitat units in the study area (STS, 2026c)

Habitat Unit	CI	FI	BI	RR	SEI	Development Constraints
Freshwater Habitat	**Medium** Confirmed or highly likely occurrence of populations of NT species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.	**High** Only minor current negative ecological impacts with no signs of major past disturbance and good rehabilitation potential.	Medium	**Very Low** Habitat that is unable to recover from major impacts, or species that are unlikely to remain at a site even when a disturbance or impact is occurring, or species that are unlikely to return to a site once the disturbance or impact has been removed.	High	**Avoidance mitigation wherever possible. Minimisation mitigation** – changes to project infrastructure design to limit the amount of habitat impacted; limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Thicket Habitat	**Medium** Confirmed or highly likely occurrence of populations of NT species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.	**Medium** Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	Low	**Medium** Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor. Species in this habitat have a moderate likelihood of returning to a site once the disturbance or impact has been removed.	Medium	**Minimisation and restoration mitigation** – development activities of medium to high impact acceptable followedby appropriate restoration activities.
Degraded Hygrophilous Grassland	**Medium** Confirmed or highly likely occurrence of populations of NT species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.	**Low** Several minor and major current negative ecological impacts.	Low	**Medium** Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor. Species in this habitat have a moderate likelihood of returning to a site once the disturbance or impact has been removed.	Medium	**Minimisation and restoration mitigation** – development activities of medium to high impact acceptable followedby appropriate restoration activities.
Transformed Habitat	**Very Low** No confirmed and highly unlikely populations of SCC. No natural habitat remaining.	**Very Low** Very small (< 1 ha) area. No habitat connectivity except for flying species or flora with wind-dispersed seeds. Several major current negative ecological impacts.	Very Low	**Very High** Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of returning to a site once the disturbance or impact has been removed.	Very Low	**Minimisation mitigation** – development activities of medium to high impact acceptable and restoration activitiesmay not be required.

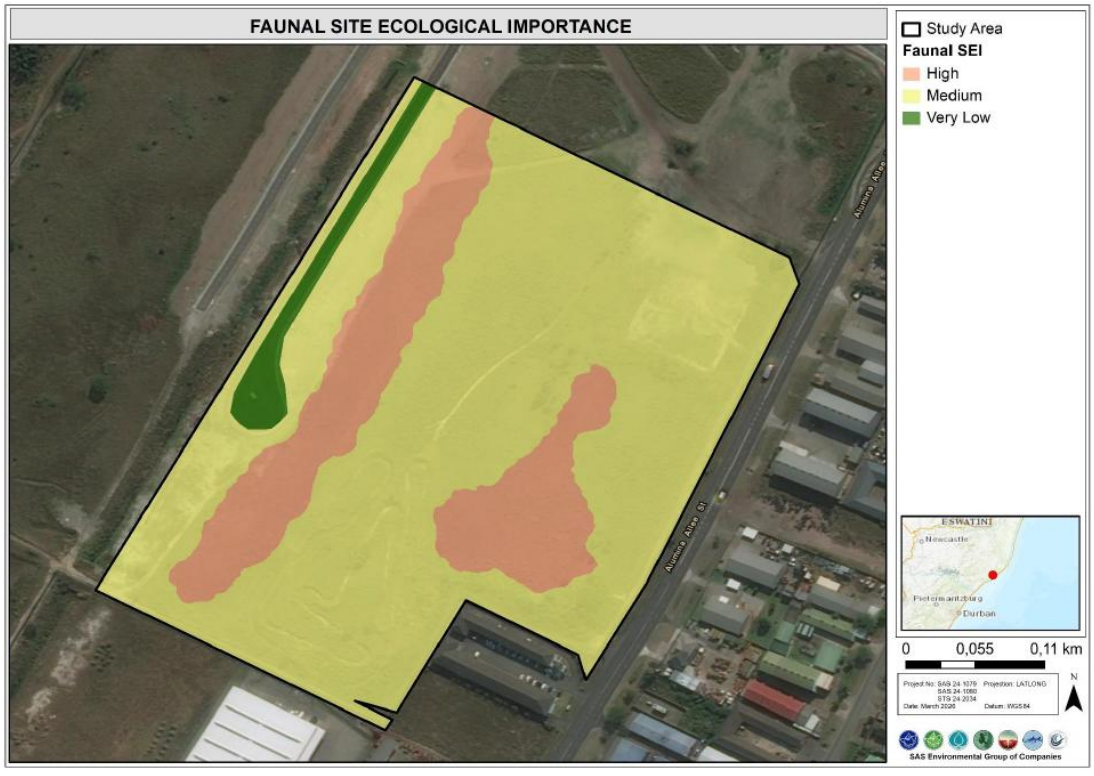


Figure 81: Faunal SEI for identified habitat types (STS, 2026c)

12.7.5.4 Impact Assessment

Refer to Section 13.15 below for the results from the impact assessments from this study.

12.7.5.5 Conclusions

Floral Assessment

The study area comprises a mosaic of degraded hygrophilous grassland, thicket, freshwater-associated habitats, and transformed areas, with portions exhibiting limited affinity to the Maputaland Wooded Grassland ecosystem (Endangered), albeit in a disturbed and modified state. The proposed development will result in the near-complete transformation of habitats within the development footprint. While freshwater features are present within the study area, it is noted that their infilling has been authorised under a separate EA for the broader RBIDZ Phase 1F development, and they are therefore not assessed as part of the current application.

The loss of terrestrial habitat will result in a reduction in local floral diversity and a localised decrease in ecosystem extent. However, the affected area is limited in extent and occurs within a landscape that is already substantially transformed and fragmented, where ecological connectivity and habitat integrity have already been reduced. Furthermore, the vegetation within the study area exhibits only partial affinity to the reference condition of the threatened ecosystem, thereby reducing its overall ecological importance.

Impacts on potentially occurring threatened plant species cannot be excluded, particularly within the less disturbed portions of the site. However, no threatened species were confirmed during the field assessment. This uncertainty has been addressed through a precautionary approach, including pre-construction walkdowns during the appropriate season and, where required, the implementation of search, rescue, and relocation measures in accordance with permit conditions. These measures are expected to reduce impacts on SCC to acceptable levels.

While the proposed development will contribute to the cumulative loss and degradation of natural habitat within the broader Richards Bay area, this contribution is considered incremental and of limited ecological consequence in the regional context. The terrestrial habitats affected are degraded and not representative of intact Endangered vegetation, and their loss is therefore unlikely to result in meaningful impacts on ecological functioning at a landscape scale.

Based on the findings of this assessment and taking into account the disturbed nature of the site, the limited extent of remaining natural habitat, and the implementation of appropriate mitigation measures, the overall significance of impacts is considered to be low. It is the opinion of the specialists that the identified risks can be reduced to acceptable levels through the application of the recommended mitigation measures and management actions.

Accordingly, the proposed development is not considered to present a fatal flaw from a botanical or terrestrial biodiversity perspective, and it is recommended that the project be considered favourably by the relevant competent authorities in terms of EA.

Faunal Assessment

The proposed development will result in the loss of faunal habitat. Direct impacts resulting from this development are expected to affect potential SCC and common faunal species. Impacts on potential SCC in the study area are not expected to be significant if all mitigation measures outlined in this report are followed. Indirect impacts on surrounding natural habitats need to be strictly mitigated to avoid significant impacts on these areas. Thus, the development is not expected to have a significant impact on the faunal assemblages, vegetation clearing only takes place where necessary and the mitigation measures stipulated within this report are implemented. Given the findings of the study, it is the reasoned opinion that the proposed development can be authorised provided that mitigation measures listed in this report are adhered to.

12.8 Visual Resource Compliance Statement

A summary of the Visual Resource Compliance Statement (SAS, 2025) follows. The specialist report is contained in **Appendix E9**.

12.8.1 Details of the Specialist

The details of the specialists that undertook the Visual Resource Compliance Statement follow.

Organisation:	Scientific Aquatic Services	
Name:	Stephen van Staden	Sanja Erwee
Qualifications:	MSc Environmental Management	BSc Zoology
Affiliation (if applicable):	SACNASP Pr.Sci.Nat. (reg. no.: 400134/05)	-

12.8.2 Objectives of the Study

The objectives of the study included the following:

- To characterise the existing visual environment and landscape character of the study area;
- To verify the DFFE Screening Tool's visual sensitivity rating through desktop and field investigations;
- To determine whether the project requires only a Visual Compliance Statement or a comprehensive Visual Impact Assessment; and
- To identify and evaluate potential visual impacts of the proposed CCGT Power Plant on the surrounding landscape and visual receptors.

12.8.3 Methodology

The methodology adopted for the Visual Resource Compliance Statement comprised the following:

- **Desktop assessment**: Geographic Information Systems (GIS), including Planet GIS, ArcGIS and Global Mapper, together with high-resolution satellite imagery, aerial photographs, topographical maps, digital elevation data and relevant environmental databases, were used to characterise the existing visual environment. The desktop assessment evaluated land use, land cover, topography and landscape character, and identified potential visually sensitive receptors within a 3 km visual assessment zone to guide the field survey.
- **Field assessment**: A site inspection was undertaken in June 2024, consisting of drive-through and walk-over surveys of the study area and surrounding environment. The assessment verified the desktop findings, evaluated the visual context, identified sensitive visual receptors and key observation points, recorded viewpoints using Global Positioning System (GPS), and captured representative photographs for the assessment.

12.8.4 Key Findings of the Study

12.8.4.1 Visual Assessment Results

Based on the field assessment the following was evident:

- According to Oberholzer (2005) (as cited in SAS, 2025) the level of assessment will be a level 2 since limited direct visual impacts are expected to occur. Should the proposed facility utilise the stack flame, indirect visual impacts are expected to occur.
- According to Mucina & Rutherford (2018) (as cited in SAS, 2025) the study area is situated within the Indian Ocean Coastal Belt Biome, and the Maputaland Wooded Grassland Vegetation Type. Refer to Appendix B of the Visual Resource Compliance Statement Report for further detail regarding the climate, altitude topography and floral species associated with this vegetation type.
- The field assessment indicated that most of the study area is well vegetated characterised by grassland vegetation and two freshwater ecosystems, and one stretch of road. Figure 61 above provides a visual representation of the environment encountered in the study area. The dense wooded grassland vegetation confines the view of the observer to its immediate surroundings, thus reducing the viewscape of the proposed development activities to within the RBIDZ. Therefore, only people working within the RBIDZ is likely to have a view. As such the vegetative component of the surrounding environment is the most dominant contributing factor in the moderately high visual absorption capacity (VAC) of the environment.
- The study area is situated in relatively flat plains, adjacent to existing industrial activities within the RBIDZ, with the entire area to the east and south, developed with industrial facilities, with some industrial development to the west and north. With the study area situated within the RBIDZ, the proposed development will blend in with the industrial landscape. According to the CoU's IDP for 2022-2027 "*The RBIDZ has been designated as special economic zone and is a national priority for stimulating growth in the manufacturing sector.*"
- The residential areas are situated to the north and east, with the closest residential area being 1,4 km north north-east. As such there are no visual sensitive receptors situated within 1 km

of the study area, rendering the proposed development activities outside the foreground of visual receptors. Residential areas are generally considered high sensitive visual receptors, however due to the distance, wooded grassland vegetation and existing industrial facilities screening the view toward the study area, the residential area may be considered low sensitive receptors.

- The main roads within the area are the N2 highway (approx. 7,7km north north-west) R34 (approx. 2,5 km south) and R619 roadway (approx. 1,5 km north-northeast). Due to their momentary views and experience of the receiving environment motorists are generally classified as low sensitivity receptors. Based on the field work though motorists traveling along these routes will not have a clear line of sight towards the project site due to the distance, vegetation and existing industrial facilities.
- According to the South African Protected Areas Database (SAPAD, 2025, Q12), the study area is located within ± 5.2 km of the Enseleni Nature Reserve and 6.1 km of the Richards Bay Game Reserve (see Figure 49 above). With the area dominated by wooded grassland vegetation, it limits the view of the observer to their immediate surroundings, and with the existing industrial structures in the landscape, visitors at the nature reserve will not observe the proposed industrial activities. This was confirmed during the field assessment as the Enseleni Nature Reserve was visited and no views of the existing industrial zone was present in the viewscape, due to the undulating terrain and wooded grassland vegetation and plantations in the landscape. The South African Conservation Areas Database (SACAD, 2025, Q2) database does not indicate any conservation areas within 10 km of the study area.
- Due to the surrounding undulating terrain, dense wooded grassland vegetation, plantations, and existing industrial zone, the proposed industrial activities will have a low-level visual intrusion on the receiving environment, as the above factors provide good screening ability, partially obscuring or completely screening the view from the majority of the receptors.
- Sense of place is the unique value that is allocated to a specific place or area through the cognitive experience of the user or viewer. It is created by the land use, character and quality of a landscape, as well as by the tangible and intangible value assigned thereto. The sense of place associated with the study area is related to the landscape character type, defined as industrial activities dominating the landscape, flat to undulating terrain. The proposed development activities will have a further effect on the sense of place of the immediate area, with the greater region not adversely affected.
- With the study area situated within the RBIDZ and the residential areas within the landscape, the area is considered to have significant sources of nighttime lighting. The lighting environment of the region is therefore considered urban with high district brightness (Zone E4) (refer to Appendix E of the Visual Resource Compliance Statement Report). According to Bortle's Scale, the study area falls within a Class 6 area (bright suburban) where there is light pollution to 35 degrees. Furthermore, it is evident that on a cloudy night the lights will be fairly bright and small objects that are close will be distinct. Development of the proposed industrial activities will be sources of light pollution during the construction and operational phases. Overall, the impact significance of potential night-time lighting is expected to be high and is likely to contribute to the effects of skyglow and light pollution.

12.8.4.2 Conclusion

Based on the outcome of the desktop and field assessment, the proposed Project will most likely have a low visual impact on the receiving environment, due to the dense wooded grassland vegetation, plantations, existing industrial structures and undulating terrain partially obscuring and/ or completely screening the view from the visual receptors present within a 3 km radius.

From a visual impact perspective, there are no fatal flaws associated with the proposed Plant. It is therefore the opinion of the visual specialist that the proposed development be considered favourably from a visual impact perspective.

12.9 Noise Impact Assessment

A summary of the Noise Impact Assessment (Enviro-Acoustic Research, 2026) follows. The specialist report is contained in **Appendix E8**.

12.9.1 Details of the Specialist

The details of the specialist that undertook the Noise Impact Assessment follow.

Organisation:	Enviro-Acoustic Research
Name:	Morné de Jager
Qualifications:	B Eng (Chemical Engineering)

12.9.2 Objectives of the Study

The Terms of Reference for the Noise Impact Assessment included the following:

The Terms of Reference for the Noise Impact Assessment is in the guidelines provided by SANS 10103:2008, SANS 10328:2008, the procedures defined in Government Gazette 43110 of 20 March 2020 (GNR 320) and the National Noise Control Regulations GN R154 of 1992. The study also considers the noise limits as proposed by the International Finance Corporation (IFC) for a residential area which is based on studies completed by the World Health Organization (WHO).

12.9.3 Methodology

The Noise Impact Assessment was undertaken in accordance with SANS 10103:2008 and SANS 10328:2008. SANS 10103 provides acceptable ambient noise levels for different land uses, while SANS 10328 prescribes the methodology and minimum content requirements for environmental noise impact assessments.

Accordingly, the methodology for the Noise Impact Assessment entailed the following:

- ❑ Define the purpose of the investigation and describe the proposed development;

- Describe the existing environment, including topography, surface conditions and meteorological conditions relevant to noise propagation;
- Identify all significant noise sources and their sound characteristics, together with any sources excluded from the assessment and the reasons for exclusion;
- Identify noise-sensitive receptors and assess the potential impacts on these receptors;
- Document assumptions, calculations, measurement procedures and noise prediction methods used in the study;
- Map the locations of measurement and modelling points and quantify the predicted noise impacts;
- Consider alternatives and record comments from I&APs; and
- Present conclusions, recommendations, mitigation measures and any monitoring or follow-up investigations that may be required after project implementation.

12.9.4 Desired Rating Levels

It should be noted that ambient sound levels at noise sensitive receptors' locations closer to the R619 road would be higher due to road traffic noises. Similar, noise sensitive receptors' locations located within industrial areas would typically be subject higher noise levels, due to traffic and industrial noises. Based SANS 10103 desired rating levels, three sets of rating levels would be relevant to the Project, namely:

- Industrial area - Project area and surrounds:
  - Daytime rating level of 70 dBA.
  - Night-time rating level of 60 dBA.
- Urban area (residential use – in vicinity of workshops; business premises; and main roads) - Locations within the industrial area; locations within 100m from the R619:
  - Daytime rating level of 60 dBA.
  - Night-time rating level of 50 dBA.
- Urban area (residential use) – Locations outside the industrial area, and further than 100m from the R619:
  - Daytime rating level of 55 dBA.
  - Night-time rating level of 45 dBA.

The acceptable noise rating levels (the zone sound level) for residential use in an urban area is the same as the noise limits recommended by the IFC and World Bank Group (WBG).

12.9.5 Main Noise Generating Components

Noise impacts will occur during both the construction and operational phases. While construction noise is transient, the primary long-term acoustic footprint is generated by the equipment within the 750MW power block during the operational phase.

For a "2+2+1" configuration utilizing GE 9F.03 gas turbines, the noise profile is dominated by high-velocity air movement and large-scale mechanical rotation. While the Combustion Turbine and Generators (CTG) are typically housed in acoustically treated weather enclosures to dampen mid-to-high frequency mechanical whine, other components contribute significantly to the far-field noise environment.

The major noise sources, typically accounting for over 80% of the Plant's acoustic output, include:

- Air Inlet Filter Houses (x2): Given the massive mass-flow requirements of the GE 9F.03 units, the air intakes generate significant high-frequency noise. Mitigation involves multi-stage silencers within the inlet ducting to dampen the "compressor whine."
- The Induced Draft Cooling Tower: The cooling tower generates noise through two primary mechanisms: the low-frequency thrum of the large-scale induced draft fans and the broadband "white noise" of water cascading into the collection basin. Mitigation includes high-efficiency, low-noise fan blade profiles and, if necessary, splash attenuation mats in the basin.
- Exhaust Stacks and Triple-Pressure HRSGs (x2): Noise is generated by turbulent exhaust gas flow and casing vibration. In a triple-pressure system, the complex internal piping can also lead to flow-induced vibration. This is mitigated using vertical silencers in the stacks and heavy-gauge acoustic lagging on the HRSG transition ducts.
- The shared Steam Turbine Generator: The single steam turbine and its condensing unit are typically housed in a dedicated steam hall. Noise here is generated by the turbine rotation, the de-aerating condenser, and the high-pressure boiler feedwater pumps.
- Balance of Plant (BOP) components: While the primary power generating components are the noisiest, the cumulative effect of BOP equipment—specifically fuel gas compression skids, lube oil coolers, and large centrifugal pumps—can influence the noise level at the plant boundary (when located away from the main noise-generating components).

It should be noted that even in industrial areas, noises from equipment and activities must also consider the potential noise impact on people working in the vicinity of the equipment. Manufacturers of such power generation equipment therefore do consider the Occupational Health and Safety requirements, providing acoustical treatment to ensure that nearby employees are not subject to unreasonable noise levels. As such manufacturers would aim to limit noise emission levels to be less than 85 dBA (measured at 10 m) from various equipment.

12.9.6 Key Findings of the Study

12.9.6.1 Projected Noise Rating Levels

Potential scenarios were conceptualized for the proposed construction and operational phases, with the output of the modelling exercise indicating a potential noise impact of low significance for both the day- and night-time periods for all the project phases. No mitigation or management measures are required or recommended to reduce noise levels. The CCPP still has to comply with the relevant Health and Safety Regulations and Guidelines that may stipulate periodic noise

monitoring (Noise-Induced Hearing Loss Regulations [GNR 307 of 2020] as well as the Occupational Health and Safety Act, 1993 [Act 85 of 1993]).

12.9.6.2 Impact Assessment

Refer to Section 13.17 below for the results from the impact assessment from this study.

12.9.6.3 Conclusion

No additional acoustic studies are recommended for this development, and it will not be required to develop or implement an environmental noise monitoring programme considering:

- ❑ The developmental character of the area;
- ❑ The results from the ambient sound level measurements; and
- ❑ The projected low significance of the noise impacts

It is recommended that the proposed 750MW CCPP project be authorised from an acoustic perspective.

12.10 Hydrology Assessment

A summary of the Hydrology Assessment (GCS, 2026) follows. The specialist report is contained in **Appendix E7**.

12.10.1 Details of the Specialist

The details of the specialist that undertook the Hydrology Assessment follow.

Organisation:	GCS Water and Environment (Pty) Ltd
Name:	Chané Pretorius
Qualifications:	MSc Environmental Sciences (Hydrology & Geohydrology)
Affiliation (if applicable):	SACNASP Pr.Sci.Nat. (reg. no.: 136692)

12.10.2 Objectives and Methodology

The objectives and methodology of this study included the following:

- ❑ Undertake a site walkover and baseline hydrological assessment;
- ❑ Delineate catchments and characterise drainage patterns using a 5 m DTM and South African National Land Cover data;
- ❑ Calculate design rainfall and peak flows;
- ❑ Model the 1:10, 1:50 and 1:100-year flood lines using HEC-RAS;
- ❑ Develop a Conceptual Stormwater Management Plan based on runoff modelling and site layout information;
- ❑ Assess baseline surface water quality through field sampling and laboratory analysis;

- Evaluate hydrological risks associated with the construction and operation of the proposed development; and
- Develop a stormwater and surface water monitoring programme for implementation during construction and operation.

12.10.3 Key Findings of the Study

12.10.3.1 Flood Line Modelling

The flood lines modelled for the site are shown in Figure 82 below. The 1:10, 1:50, and 1:100-year flood lines suggest that the canal will definitely pose a risk of flooding to the plant and associated infrastructure, especially in the wetland areas. It should be noted that the available topography 5m data was modified to characterise the canal. The canal was characterised based on available information.

A probability of inundation onsite is expected in areas associated with wetlands. The 1:100-year flood line should be considered an avoidance area (buffer area). Care should be taken if the plant or other infrastructure is expanded into the demarcated flooding areas. If development does take place in the exclusion zone, proper flooding protocols and erosion prevention measures should be implemented. These would need to be designed by a certified and registered civil engineer.

Steady-state flood modelling was undertaken, which is a conservative approach as it ignores the effect of storage within the system and therefore produces higher flood levels than would be expected to occur. A steady-state model will result in worst-case (conservative) estimates of flooding, and resultant flood levels and floodplain extents would decrease if unsteady state modelling were undertaken using an inflow hydrograph as opposed to continuous peak flow. It is noted that some of the flooding zones make flooding “bubbles” or islands. This is due to the moderate-low-resolution DTM, which causes irregular flooding paths. The flood lines produced are based on available data. Due to the flood risk posed to the project infrastructure, further flood modelling work is considered necessary and would require more detailed topographical data.

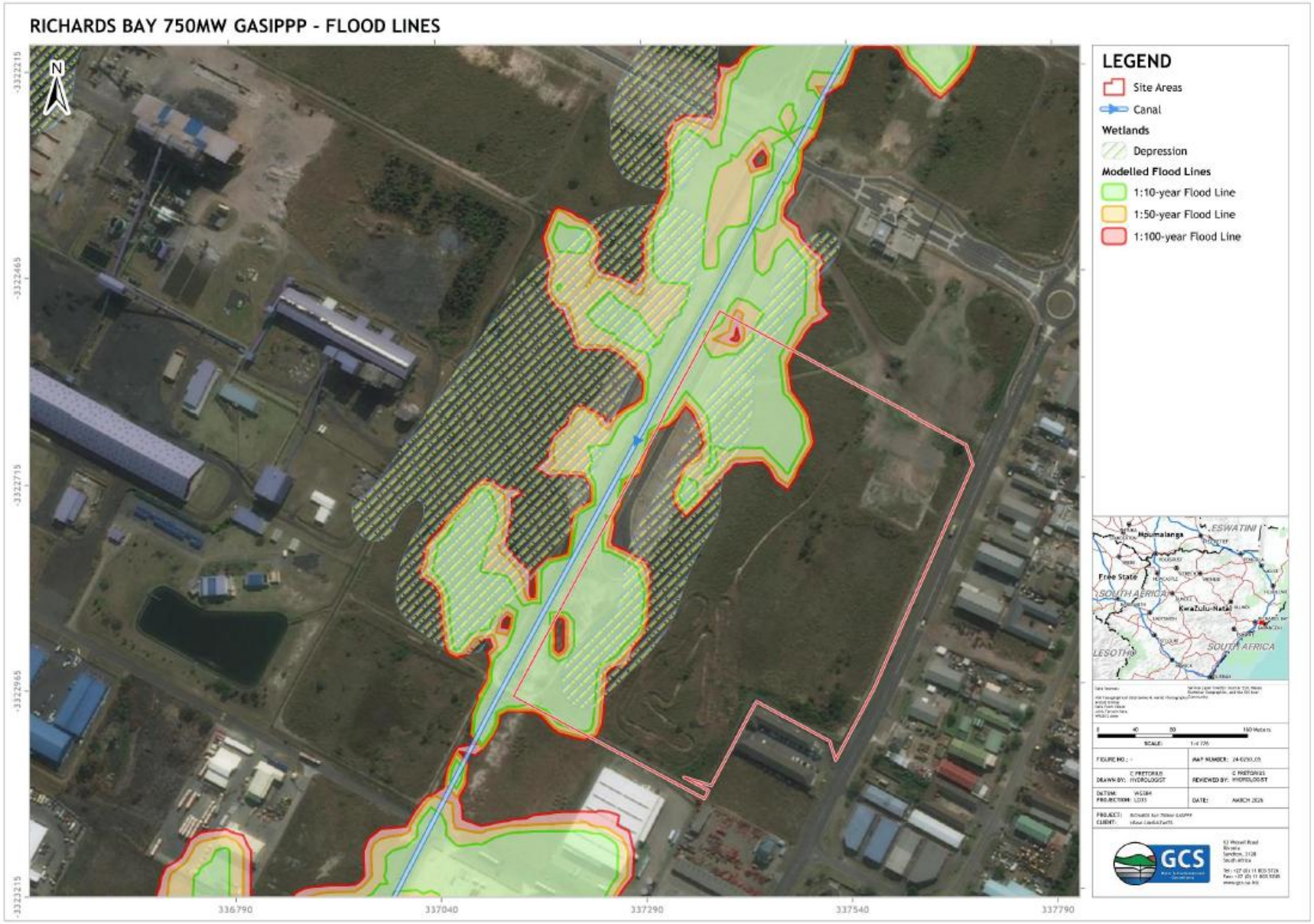


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Figure 82: Simulated 1:10, 1:50 and 1:100-year flood inundation zones (GCS, 2026)

12.10.3.2 Stormwater Management Plan

Existing Stormwater Infrastructure

The site is large undeveloped apart from the existing access tar road and surrounding stormwater infrastructure. The following stormwater infrastructure are currently present around the project area:

- There are roadside channels and intermittent drains on Alumina Allee Street immediately east of the site. This captures and routes stormwater from the road and other areas east of the site.
- The canal west of the site captures stormwater runoff from the upper reaches of the catchment area and other areas west of the site.
- The roadside channels and the canal effectively eliminate any potential clean water from entering the site from the east or west.

Conceptual Plan

A Conceptual Stormwater Management Plan was developed to guide the management of stormwater runoff from the site. The plan focuses on the separation of clean and potentially contaminated runoff, stormwater diversion and containment measures, and attenuation infrastructure where required.

Runoff generated from the site is expected to consist primarily of stormwater from impervious surfaces such as roofs, paved areas, and parking areas. While this runoff is generally considered clean stormwater, localised contaminants such as hydrocarbons from vehicles or equipment may occur in certain areas and should therefore be managed through appropriate stormwater infrastructure. In this regard, areas of greater concern of contamination risk (including the cooling tower, fuel storage and handling areas, transformer yards, chemical storage areas, maintenance workshops, and waste storage areas) should be bunded.

Layout

The layout of the proposed Plant was optimised by the technical team following completion of the Scoping Phase. Notwithstanding these refinements, the hydrological characteristics of the contributing sub-catchment remain unchanged. In addition, the overall development footprint has not materially increased, and the proportion of impervious surfaces remains broadly consistent with that assessed as part of the Hydrology Assessment.

According to GCS (2026), the hydrological assessment and conceptual stormwater management plan are intended solely to inform and support civil engineering aspects and subsequent designs. Furthermore, it is stated in the Hydrology Assessment Report that the stormwater management plan is considered conceptual, and detailed civil engineering designs should be conducted before any construction activities of the proposed measures are commenced. Hence, it is recommended in Section 16 below that a detailed Stormwater Management Plan needs to be compiled for the Plant during the detailed design phase, which will need to be submitted to DFFE to approval prior to construction.

12.10.3.3 Impact Assessment

A hydrological risk assessment (see Section 13.13 below) identified potential risks during both the construction and operational phases, including sediment mobilisation, stormwater contamination, and flood-related risks associated with the nearby canal. With the implementation of appropriate stormwater management measures, erosion control practices, and environmental management procedures, the significance of these risks is expected to be reduced to acceptable levels.

A surface water monitoring programme was also developed to monitor water quality within the canal during both the construction and operational phases of the Project.

12.10.3.4 Conclusion

With the implementation of the recommended stormwater management measures, monitoring programme, and environmental management controls, the significance of the identified hydrological impacts is expected to be low to acceptable.

Based on the existing activities and identified mitigation measures, GCS believes that the authorisation of the activities should be considered. The final decision rests with the Government Authorities and should be based on the predicted hydrological impacts as well as the Project's socio-economic value. This statement is further founded on the assumption that the proposed mitigation measures and EMPr recommendations will be implemented during the life of the Project.

12.11 Health Impact Assessment

A summary of the Community Health Impact Assessment (Niara Environmental Consultants, 2026) follows. The specialist report is contained in **Appendix E10**.

12.11.1 Details of the Specialist

The details of the specialist that undertook the Community Health Impact Assessment follow.

Organisation:	Niara Environmental Consultants
Name:	Vumile Ribeiro
Qualifications:	BSocSc. Hons. (Environmental Analysis and Management)
Affiliation (if applicable):	SACNASP 2019/1183

12.11.2 Objectives of the Study

The objectives of the Community Health Impact Assessment include the following:

- Establish a baseline health profile for the study area, including national, provincial, district and local health characteristics relevant to the Project;
- Identify potentially affected communities within the project's area of influence;

- Identify potential pathways of health impact associated with the proposed development;
- Assess potential direct, indirect and cumulative health impacts associated with the construction, operation and decommissioning of the Project;
- Evaluate potential impacts on vulnerable or sensitive population groups, including children, the elderly and individuals with pre-existing health conditions;
- Assess the potential implications of the Project for local healthcare infrastructure and services;
- Identify positive health outcomes, including potential socio-economic improvements associated with employment and economic development; and
- Recommend mitigation measures, monitoring programmes and management interventions to prevent or minimise adverse health impacts.

12.11.3 Methodology

The Community Health Impact Assessment aims to be consistent with international good practice, including the IFC Good Practice Note on Health Impact Assessment and IFC Performance Standard 4: Community Health, Safety and Security (IFC, 2009; IFC, 2012, as cited in Niara Environmental Consultants, 2026).

The following key activities were undertaken as part of this study:

- Desktop review of available literature, including national and regional health data sources;
- Review of relevant policy and legislative frameworks governing environmental health and public health in South Africa;
- Review of project information, including project design, infrastructure requirements and operational characteristics;
- Identification of potentially affected communities and sensitive receptors;
- Review of other specialist studies conducted as part of the EIA process (e.g., air quality, noise, socio-economic and risk assessments);
- Assessment of health determinants associated with the proposed Project activities;
- Identification and evaluation of potential health impacts using an established impact assessment methodology; and
- Development of mitigation measures and monitoring recommendations to manage identified risks.

12.11.4 Environmental Health Areas Framework

The study evaluated potential health impacts across the following Environmental Health Areas (EHAs):

- EHA #1 – Vector-related Diseases;
- EHA #2 – Acute Respiratory Infections and Respiratory Effects;
- EHA #3 – Veterinary Medicine and Zoonotic Diseases;
- EHA #4 – Sexually Transmitted Infections, including HIV/AIDS;
- EHA #5 – Soil-, Water- and Waste-related Diseases;
- EHA #6 – Food and Nutrition-related Issues;

- EHA #7 – Accidents and Injuries;
- EHA #8 – Exposure to Hazardous Materials, Noise and Malodours;
- EHA #9 – Social Determinants of Health;
- EHA #10 – Cultural Health Practices;
- EHA #11 – Health Systems Issues; and
- EHA #12 – Non-Communicable Diseases.

This framework recognises that health outcomes are influenced not only by environmental exposures but also by broader social and economic factors that affect community wellbeing.

12.11.5 Key Findings of the Study

12.11.5.1 Integrated Health Impact Significance

The impact assessment confirmed that the proposed CCGT Power Plant is not associated with a single dominant disease pathway, but with a set of interacting environmental, occupational and social determinants of health. The most significant adverse impacts are associated with:

- Cumulative respiratory and cardiovascular exposure linked to stack emissions and existing industrial airshed burden;
- Occupational health and safety risks associated with combustion turbines, HRSGs, steam systems, electrical infrastructure, confined spaces, cooling systems and hazardous substances;
- Road traffic accidents and construction-related injuries;
- Social determinants of health, including labour influx, employment expectations, inequality and psychosocial stress; and
- Health system pressure during construction and emergency scenarios.

The most important positive impacts are associated with employment, household income, skills transfer, supplier development and improved social determinants of health among beneficiary households.

After mitigation, no health impact is assessed as a fatal flaw. Residual risks remain most important for cumulative respiratory exposure, non-communicable disease (NCD) vulnerability, occupational health and road safety. These risks require active management through the EMPr, AEL conditions, occupational health and safety system, traffic management plan, stormwater management plan, emergency response plan and health monitoring programme.

12.11.5.2 Integrated Interpretation of Specialist Findings

The Community Health Impact Assessment for the proposed Project is supported by a suite of specialist studies undertaken as part of the broader EIA process. These specialist studies provide the technical basis for understanding existing environmental and social conditions, identifying project-related exposure pathways, and evaluating the significance of potential health outcomes for surrounding communities and workers.

Taken together, the specialist studies confirm that the proposed Project should not be interpreted through isolated discipline-specific risks, but through cumulative health exposure within an existing industrial setting. The most important conclusion is that the Project is being introduced into a receiving environment that already experiences elevated environmental stressors, including industrial air pollution, transport-related exposure, noise, socio-economic inequality and dependence on finite health system capacity. The principal health concern is therefore cumulative exposure rather than singular exceedance.

The highest significance pathways are:

- Respiratory health and air quality exposure;
- Social determinants of health and labour influx;
- Accidents and injuries associated with traffic and industrial movement;
- HIV/STI vulnerability linked to mobility and economic change; and
- Health system pressure associated with increased demand.

Lower significance but still relevant pathways include water-related disease risk, vector conditions, visual and psychosocial stress, and occupational noise exposure. The specialist findings collectively support the conclusion that the Project is potentially acceptable from a health perspective, provided that mitigation measures are designed around cumulative exposure management rather than isolated compliance thresholds.

12.11.5.3 Impact Assessment

Refer to Section 13.20 below for the results from the impact assessment from this study.

The overall health significance of the Project is assessed as moderate to high in the absence of mitigation, driven primarily by cumulative air quality impacts and social determinants of health. With the implementation of mitigation measures and operational controls, the significance is reduced to moderate, with impacts considered manageable within the existing environmental and social context.

The most critical determinant of acceptability is the management of cumulative air quality impacts, which require strict emission control, ongoing monitoring and integration with broader airshed management processes.

12.11.5.4 Conclusion

Based on the findings of this assessment, the proposed 750 MW CCGT Power Plant is considered acceptable from a community health perspective, subject to strict implementation of mitigation measures, effective monitoring and ongoing adaptive management.

The Project does not introduce fundamentally new health risk pathways, but it does intensify existing risks within a cumulatively stressed environment. Its acceptability is therefore conditional on maintaining operational performance, preventing system failures, managing social impacts and

ensuring that its incremental contribution to environmental and health burden remains within acceptable limits.

Under these conditions, the Project is not expected to result in unacceptable health outcomes and may proceed in a manner that is technically defensible, scientifically grounded and regulatorily robust.

12.12 Socio-Economic Impact Assessment

A summary of the Socio-Economic Impact Assessment (Urban-Econ, 2026) follows. The specialist report is contained in **Appendix E11**.

12.12.1 Details of the Specialist

The details of the specialists that undertook the Socio-Economic Impact Assessment follow.

Organisation:	Urban-Econ	
Name:	Tinotenda Makoni	Stephen Karombe
Qualifications:	M Com Economics	M Com Economics

12.12.2 Objectives of the Study

The objective of the Socio-Economic Impact Assessment was to identify and evaluate the potential socio-economic impacts of the proposed Project, determine the significance of these impacts from a sustainable development perspective, identify appropriate mitigation and enhancement measures, and provide a reasoned opinion on the socio-economic desirability and acceptability of the proposed development.

12.12.3 Methodology

The methodology employed for the study entailed the following:

- Engage with the EAP other specialists on the team and the client to gain the necessary background on the Project;
- Determine the assumptions for the study as well as possible limitations.
- Determine the data required to assess potential impacts and review secondary data available to determine the suitability of the data for the analysis and the data gaps.
- Delineate the area of impact in consultation with other specialists on the team.
- Determine the affected communities and economic activities located in the area of impact and identify sensitive receptors and beneficiaries within the delineated study areas, i.e., people, land uses and economic activities that could be directly or indirectly negatively affected by the proposed Project or benefit from it.

- Assess the sensitivities of the identified sensitive receptors relative to the proposed development and analyse potential positive and negative social and economic effects of the proposed development on the local and regional economic activities.
- Create a socio-economic profile of the potentially affected and benefiting environment, which would then represent a description of the existing impacts exerted on the area of impact and would be used to assess the potential changes that ensued from the proposed Project.
- Evaluate the potential positive and negative impacts.
- Assess cumulative effects of the Project given the existing and planned developments in the area.
- Propose mitigation measures for negative effects and enhancement measures for positive impacts.
- Provide recommendations on whether the proposed Project should be authorised and whether the associated activities are acceptable from the socio-economic perspective.

12.12.4 Key Findings of the Study

12.12.4.1 Impact Assessment

Refer to Section 13.21 below for the results from the impact assessment from this study.

12.12.4.2 Conclusion

The assessment indicates that the proposed Project is broadly aligned with national, provincial and local development and energy policy frameworks and is expected to generate meaningful socio-economic benefits over both the construction and operational phases. These benefits include temporary employment and economic stimulus during construction, as well as sustained contributions to production, GDP, employment and household income over the Plant's operational lifespan. In addition, the Project plays a strategic role in supporting the development of a regional gas hub in Richards Bay, thereby enhancing energy security, improving grid reliability and strengthening the competitiveness of energy-intensive industries.

At the same time, the Project will give rise to a range of negative socio-economic impacts, including air quality emissions, visual changes and localised disturbances during construction and decommissioning. While most of these impacts are assessed to be of low to moderate significance and largely confined to the local area, certain cumulative effects, particularly in relation to air quality within an already industrialised airshed, require careful management.

Importantly, the assessment finds that most identified negative impacts can be effectively mitigated through the implementation of appropriate design measures, environmental management plans and operational controls. These include the adoption of best-practice emission reduction technologies, ongoing monitoring and compliance and targeted mitigation measures to manage construction-related disturbances, operational and decommissioning risks.

Overall, the Project is acceptable from a socio-economic perspective, provided that recommended mitigation and enhancement measures are implemented and that the development is integrated within South Africa's broader energy transition pathway. Under these conditions, the Project is expected to result in a net positive impact, contributing to long-term economic development, improved energy security and the continued positioning of Richards Bay as a strategic industrial and energy hub.

It is therefore the reasoned socio-economic opinion that the Project may proceed and may be supported for approval, subject to the conditions and commitments set out in this report.

12.13 Desktop Palaeontology Impact Assessment

A summary of the Desktop Palaeontology Impact Assessment (Banzai Environmental, 2026) follows. The specialist report is contained in **Appendix E15**.

12.13.1 Details of the Specialist

The details of the specialist that undertook the Desktop Palaeontology Impact Assessment follow.

Organisation:	Banzai Environmental
Name:	E. Butler
Qualifications:	MSc Zoology
Affiliation (if applicable):	Palaeontological Society of South Africa

12.13.2 Objectives of the Study

The aims of this study are to identify palaeontological sites/sensitivity that may occur in the proposed project area, to inform the EIA Process, and to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve, and develop them within the framework provided by the NHRA.

12.13.3 Methodology

The methodology employed for this study involved:

- Determining the geology underlying the site;
- Evaluating the palaeontological sensitivity of the geological formations using the SAHRIS and DFFE screening datasets;
- Assessing the likelihood of fossil occurrence and the potential impact of excavation activities on fossil resources; and
- Determining whether a site-specific field investigation was required.

Based on the low palaeontological sensitivity, a field investigation was not considered necessary.

12.13.4 Key Findings of the Study

The proposed study area is underlain by unconsolidated Quaternary dune sands derived from the reworking of the Kosi Bay Formation on the Northern Natal coastal plain that resulted from marine regression and dry periods when dune formation was wide spread. These are characterised as yellowish-red, grey, and white dune sands with local pockets of calcareous clays. The SAHRIS Palaeontological Sensitivity Map classifies the area as having Low Palaeontological Sensitivity (Almond & Pether, 2009; Almond *et al*., 2013 as cited in Banzai Environmental, 2026), which is supported by the DFFE Screening Tool Report.

It is therefore considered that the Project may be authorised, as the development footprint is not considered sensitive in terms of palaeontological resources. It is consequently recommended that no further palaeontological heritage studies, ground truthing and/or specialist mitigation are required, unless fossil material is discovered during construction.

12.14 Agricultural Agro-Ecosystem Assessment Statement

A summary of the Agricultural Agro-Ecosystem Assessment Statement (Index, 2024) follows. The specialist report is contained in **Appendix E14**.

12.14.1 Details of the Specialist

The details of the specialist that undertook the Agro-Ecosystem Assessment Statement follow.

Organisation:	Index
Name:	Dr. Andries Gouws
Qualifications:	PhD Integrated Land Use Modelling
Affiliation (if applicable):	SACNASP Pr.Sci.Nat. (reg. no.: 400140/06)

12.14.2 Objectives of the Study

The objectives of this study included the assessment of the following:

- Loss of high-potential agricultural land and cultivated areas;
- Loss of grazing land;
- Loss of agricultural infrastructure;
- Impacts of the project from an agricultural perspective; and
- Suitable mitigation measures to address the identified impacts.

12.14.3 Methodology

The approach to the study entailed the following:

- Present land uses were identified using various satellite images available on the internet.
- A reconnaissance-level soil survey was conducted on the property.

- Soil types and depths were determined using a soil auger and/or soil probe and described according to the Binomial Soil Classification System used in South Africa.
- Photographs were taken and their positions recorded on GIS.
- Climate data was sourced from online resources.
- Soil capability was assessed according to the system used by the Department of Agriculture, Land Reform, and Rural Development (DALRRD).
- Agricultural sensitivity was evaluated using the Screening Tool.

12.14.4 Key Findings of the Study

12.14.4.1 Land Uses

The property is vacant and located within the Security Control Area, where farming is not permitted. No cultivated land was detected in proximity of the site. There are some plantations to the north-west of the site.

12.14.4.2 Soil

The underlying material is aeolian or wind-blown sands. The soil is generally between 600 to more than 1000 mm deep, with colours ranging from light grey to dark grey.

12.14.4.3 Land Use Capability

Based on the assessment, the following is noted:

- Deep Regic Sands: The entire site is composed of coarse sands classified as Namib. These sands are not cultivated and exhibit low sensitivity.
- Uneven Land with Perched Water Table: The remaining land in the middle portion of the site is characterised by uneven terrain with a perched water table that is covered with facultative hydrophytic vegetation. This area has low agricultural sensitivity.
- Screening Tool assessment discrepancies:
  - The tool incorrectly categorised the water-saturated areas as having very high sensitivity.
  - The clay content of the regic sands is below 10%, which is typically the threshold where cation exchange capacity is too low for effective nutrient adsorption by plants. Consequently, nutrients are leached beyond the root zone and are unavailable for normal plant growth.
  - The entire site falls within a Security Zone designated for industrial use, where farming is prohibited. Therefore, the site has no agricultural potential.

12.14.4.4 Impact Assessment

No impact assessment was included in the EIA Report, as the specialist found that the Project will not have any impact on agriculture.

12.14.4.5 Conclusion

The entire site has very low sensitivity related to agriculture. The land is located within a Security Control Zone where crop production is prohibited. The development will have no impact on agriculture. It will not result in the loss of high-potential land or its associated agricultural production. The soils are not arable due to the land being situated in an industrial area and its low potential for farming. Given these factors, it is recommended that the Project be approved.

12.15 Traffic Impact Assessment

Zutari (Pty) Ltd was appointed by the RBIDZ to update the Traffic Impact Assessment that was previously prepared by SMEC in 2013 for the broader Phase 1F development of the RBIDZ. A summary of the updated Traffic Impact Assessment (Zutari, 2024) follows. The report is contained in **Appendix F**.

12.15.1 Details of the Specialist

The details of the representative from the team that undertook the Traffic Impact Assessment follow.

Organisation:	Zutari
Name:	Mike van Tonder
Qualifications:	BSc Civil Eng
Affiliation (if applicable):	ECSA Pr Eng - 930543

12.15.2 Objectives of the Study

The objectives of the Traffic Impact Assessment included the following:

- Assess the performance of the existing road network and adjacent road network based on current traffic volumes, and in comparison, with the 2013 counted traffic volumes;
- Quantify potential trips generated as a result of the proposed development as per the investor pipeline;
- Determine and assess the local impact of the proposed land use on the road and transportation system surrounding the development;
- Identify whether it is possible accommodate the proposed higher density land use, with or without the implementation of mitigation measures;
- Consider, and report on potential additional vehicular access points from the proposed Western Arterial (from the north, and /or south) in support of the existing main vehicular entrance to Phase 1F from Alumina Allee, Alton North;
- Consider road safety issues;
- Evaluate public transport infrastructure and potential requirements;
- Consider pedestrian movements in the vicinity of RBIDZ Phase 1F; and
- Assess on-street truck parking along the roads in the immediate vicinity of the RBIDZ Phase 1F.

12.15.3 Methodology

The traffic engineering assessment was undertaken in accordance with the COTO TMH 16 Volume 1 & 2 'Traffic Impact and Site Traffic Assessment Manual' and COTO TMH 17 'Trip Data Manual'. The methodology comprised a site inspection, traffic surveys at key intersections, collection and review of development-related information, estimation of future traffic generation, traffic distribution and assignment, assessment of operational impacts on the surrounding road network, and evaluation of appropriate mitigation measures. The results were used to determine the anticipated traffic impacts of the RBIDZ Phase 1F industrial development and to formulate recommendations to ensure the continued safe and efficient operation of the transport network.

12.15.4 Key Findings of the Study

The following conclusions were drawn based on the traffic analysis:

- The 10-year forecast traffic without the development generated traffic analysis shows acceptable levels of service and upgrades are necessary, as the intersections function satisfactorily overall, maintaining an acceptable level of service.
- The full development of RBIDZ Phase 1F will generate 5 220 two-way trips in the AM and PM peak hours in the 10 years (2034).
- Scenario A is the Maximum potential weekday AM and PM peak hour traffic expected to be generated by the proposed RBIDZ Phase 1F development using the existing main access only.
- For Scenario A the analysis indicated that the Heliumhoogte, Via Davallia and R619 Intersection and the Main Site Access (Alumina Allee and Diamantpyp Intersection) will experience congestion during the weekday AM and PM peak hours and will need to be upgraded.
- Five secondary access options were proposed in support of the existing main vehicular entrance to Phase 1F from Alumina Allee, Alton North. The following two secondary access options listed below were deemed to be feasible from a technical and financial perspective:
  - Option 1B; and
  - Option 4.
- These options were therefore analysed as Scenarios B and C to compare their suitability, convenience, and cost-effectiveness, with the objective to determine the optimal solution.
- Scenario B is based on the 2034 Design Year Weekday AM and PM peak hour traffic volumes plus the maximum potential Weekday AM and PM peak hour traffic expected to be generated by the proposed RBIDZ Phase 1F development for Option 4 with development generated traffic split between the following two accesses (see Figure 83 below):
  - 35% of generated traffic will use the proposed secondary access (Option 4); and
  - 65% of generated traffic will use the existing main access.
- The Scenario B analysis indicated that the Heliumhoogte / Via Davallia and R619 Intersection will experience congestion during the weekday AM and PM peak hours and will need to be upgraded.

- Scenario C is based on the 2034 Design Year Weekday AM and PM peak hour traffic volumes plus the maximum potential Weekday AM and PM peak hour traffic expected to be generated by the proposed RBIDZ Phase 1F for Option 1B with the development generated traffic split between the two accesses.
- The Scenario C analysis indicated that the Heliumhoogte, Via Davallia and R619 Intersection and the Main Site Access (Alumina Allee and Diamantpyp Intersection) will experience congestion during the weekday AM and PM peak hours and will need to be upgraded.
- It can be concluded that Scenario B – Western By-pass link is the preferred secondary access option, as it distributes the Phase 1F traffic onto a wider road network and requires fewer channels at the main access gate. This is, however, not favoured by the municipality who would prefer that Alton North and RBIDZ 1F use the North Central Arterial (R619).

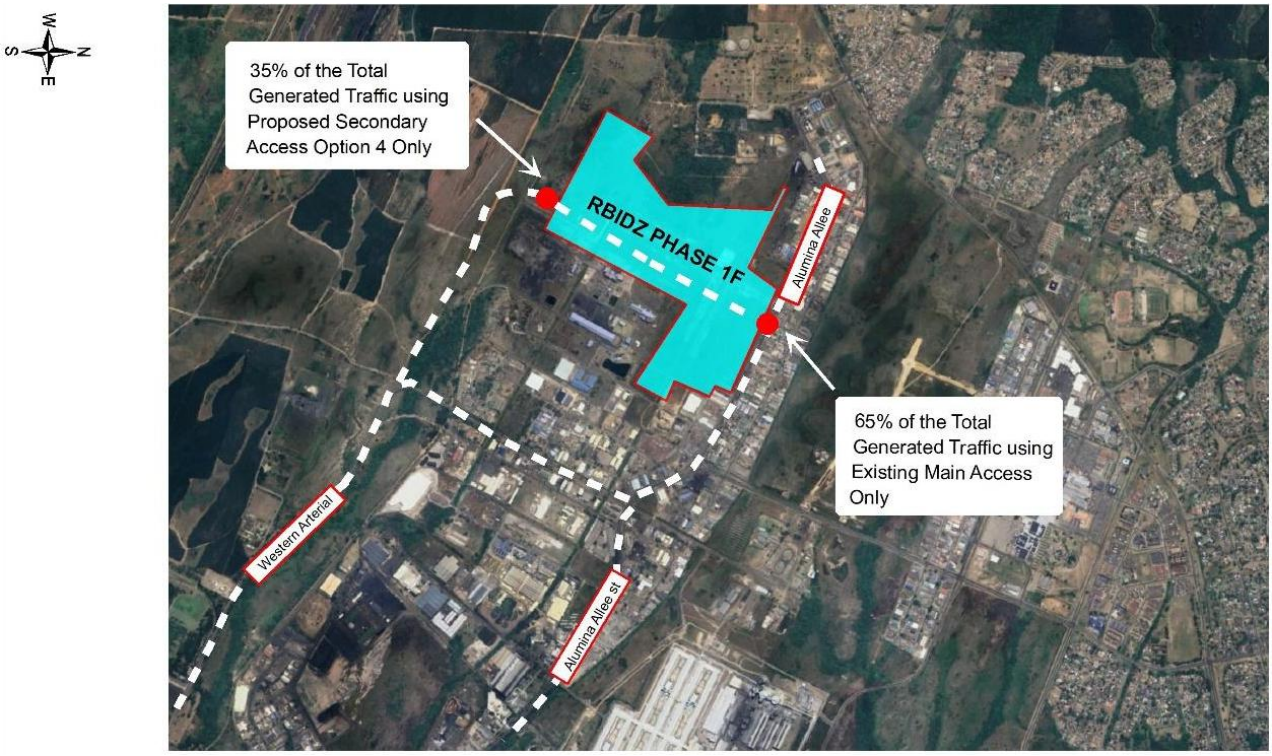

Figure 83: Scenario B - Proposed Secondary Access Option 4 (Zutari, 2024)

12.15.5 Recommendations

The following recommendations are made based on the traffic analysis:

- Scenario B (Option 4) (shown in Figure 83 above) is the recommended option for a secondary access to RBIDZ Phase 1F.
- The identified external road upgrades will be required only once the RBIDZ is more developed, and congestion start occurring at the two intersections concerned.
- A more detail assessment of the Main Gatehouse will be required in order to establish whether there is sufficient space to accommodate additional channels as calculated and recommended above.
- RBIDZ needs to engage with the CoU regarding the location of future public transport facilities.

- Wherever these public transport facilities are located in the future, the roads along which the pedestrians will walk between RBIDZ and these facilities will need 3 m wide sidewalks along both edges.
- RBIDZ needs to engage with the CoU regarding future road and rail planning especially to the south and west of RBIDZ Phase 1F.
- Road safety conditions need to be monitored on a regular basis as more development occurs at RBIDZ Phase 1F and pedestrian activity increases.
- Pedestrian activity needs to be monitored on a regular basis as more development occurs at RBIDZ Phase 1F and public transport facilities are provided by the municipality.
- The parking of heavy vehicles along the verges of roads needs to be monitored on a regular basis and should this start occurring, additional appropriate signage needs to be erected along these roads and active law enforcement should be requested from the CoU.

12.16 Quantitative Risk Assessment

A summary of the Quantitative Risk Assessment (RISCOM, 2026) follows. The specialist report is contained in **Appendix E13**.

12.16.1 Details of the Specialist

The details of the specialist that undertook the Quantitative Risk Assessment follow.

Organisation:	RISCOM
Name:	Mike Oberholzer
Qualifications:	BSc (Chem. Eng.)
Affiliation (if applicable):	• Pr. Eng. • IChemE • SAIChE

12.16.2 Objectives of the Study

The main aim of the investigation was to quantify the risks to employees, neighbours and the public with regard to the proposed Plant.

The scope of the risk assessment was to:

- Develop accidental spill and fire scenarios for the facility;
- Using generic failure rates, determine the probability of each scenario identified, as well as potential consequences;
- Where the consequence / risk will extend beyond the site boundary, to calculate the maximum individual risk (MIR), taking into account the generic failure rates, initiating events, meteorological conditions and the lethality;
- Determine and comment on the societal risk posed by the facility;
- Recommend mitigation measures to minimise risks where required; and

- Identify and assess impacts, including cumulative impacts of the Project.

This risk assessment is not intended to replace an MHI risk assessment nor any other legal requirements.

12.16.3 Methodology

The first step in any risk assessment is to identify all hazards. The merit of including a hazard for further investigation is then determined by how significant it is, normally by using a cut-off or threshold value. The Plant's layout that was considered during the assessment is shown in Figure 84 below.

Once a hazard has been identified, it is necessary to assess it in terms of the risk it presents to the employees and the neighbouring community. In principle, both the probability and the consequence should be considered, but there are occasions where, if either the probability or the consequence can be shown to be sufficiently low or sufficiently high, decisions can be made based on just one factor.

During the hazard identification component of this report, the following considerations weree taken into account:

- Chemical identities;
- Location of on-site installations that use, produce, process, transport or store hazardous components;
- Type and design of containers, vessels or pipelines;
- Quantity of material that could be involved in an airborne release; and
- Nature of the hazard most likely to accompany hazardous materials spills or releases, e.g. airborne toxic vapours or mists, fires or explosions, large quantities to be stored and certain handling conditions of processed components.

The evaluation methodology assumes that the facility will perform as designed in the absence of unintended events such as component and material failures of equipment, human errors, external events and process unknowns.

Risk assessments done in accordance with the MHI Regulations are required to be conducted according to SANS 1461 (2018). This standard is specific to the MHI risk assessment that is required to be done prior to construction and includes elements that is not usually available at the preparation, such as emergency plans and mitigation suggested during the EIA process.

SANS 1461 (2018) is based on RIVM (2009) (as cited in RISCOM, 2026) for process plants. The latter standards describe the minimum scenarios to be included in the assessment, as well as the assumptions to be used. As full compliance of SANS 1461 (2018) cannot be achieved within the NEMA legislative framework, general compliance with the aforementioned standards would be applicable and briefly described in the Quantitative Risk Assessment report.

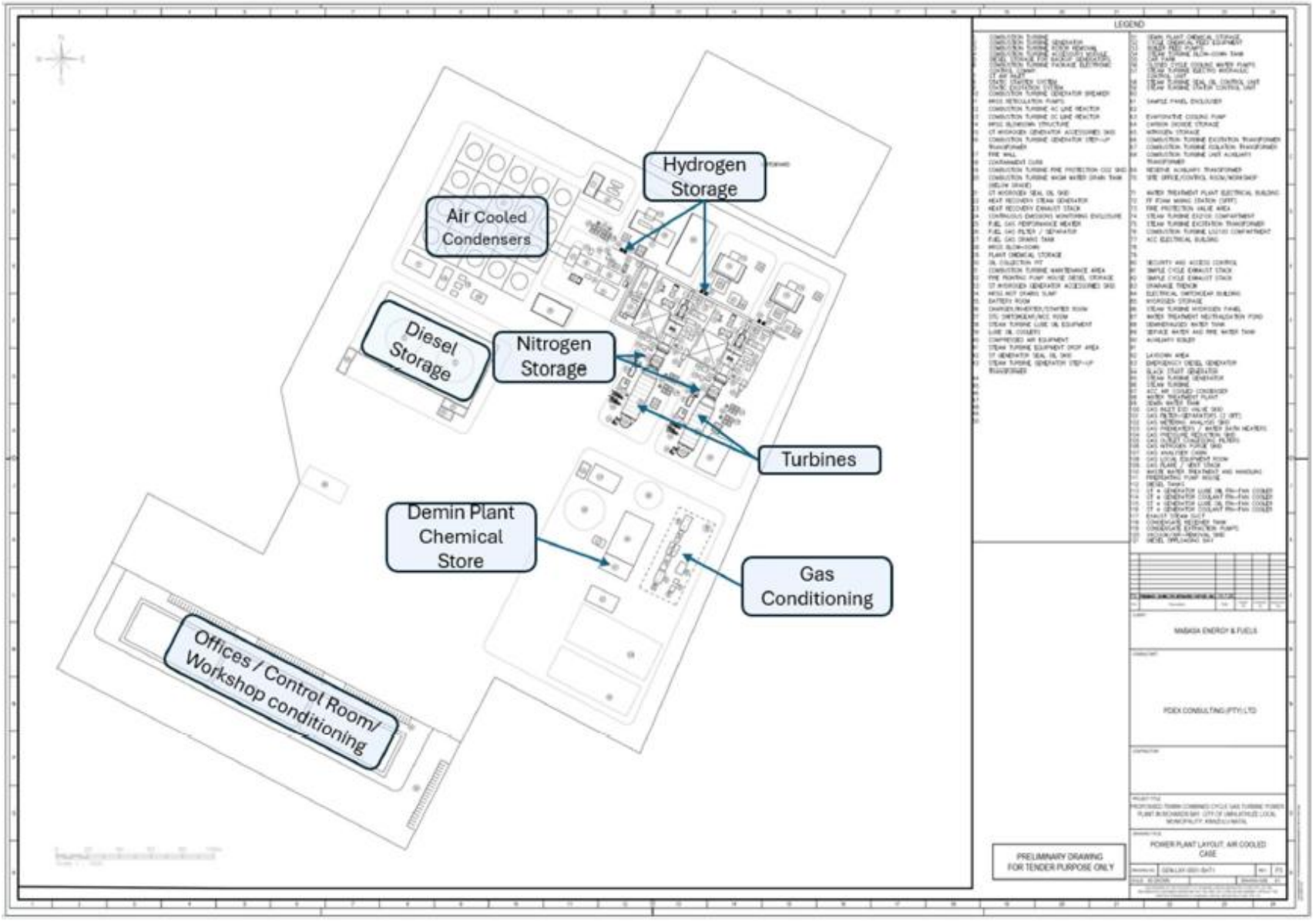

Figure 84: Layout of proposed Plant considered during Quantitative Risk Assessment (RISCOM, 2026)

The Quantitative Risk Assessment process is summarised with the following steps:

- Step 1 - Identification of components that are flammable, toxic, reactive or corrosive and that have the potential to result in a major incident from fires, explosions or toxic releases;
- Step 2 - Development of accidental loss of containment (LOC) scenarios for equipment containing hazardous components (including release rate, the location and orientation of the release);
- Step 3 - For each incident developed in Step 2, determination of consequences (such as thermal radiation, domino effects, toxic-cloud formation and so forth); and
- Step 4 - For scenarios with off-site consequences (greater than 1% fatality off-site), calculation of the MIR, taking into account all generic failure rates, initiating events (such as ignition), meteorological conditions and lethality.

Scenarios included in this Quantitative Risk Assessment have impacts externally to the establishment. The 1% fatality from acute affects (thermal radiation, blast overpressure and toxic exposure) is determined as the endpoint (RIVM, 2009 as cited in RISCOM, 2026). Thus, a scenario producing a fatality of less than 1% at the establishment boundary under worst-case meteorological conditions, would be excluded from the QRA.

12.16.4 Acceptable Risks

After having characterised a risk and obtained a risk level, it must be recommended whether the outcome is acceptable.

In contrast to the employees at a facility, who may be assumed to be healthy, the adopted exposure assessment applies to an average population group that also includes sensitive subpopulations. Sensitive subpopulation groups are those people that for reasons of age or medical condition have a greater than normal response to contaminants. Health guidelines and standards used to establish risk normally incorporate safety factors that addresses this group.

Among the most difficult tasks of risk characterisation is the definition of acceptable risk. In an attempt to account for risks in a manner similar to those used in everyday life, the UK Health and Safety Executive developed the risk ‘as low as reasonably practicable’ (ALARP) triangle (shown in Figure 85 below). ALARP, as used in the UK, it is the region between that which is intolerable, at $1x10^{-4}$ per year, and that which is broadly acceptable, at $1x10^{-6}$ per year. A further lower level of risk, at $3x10^{-7}$ per year, is applied to either vulnerable or very large populations for land-use planning.

Applying the triangle involves deciding:

- Whether a risk is so high that something must be done about it;
- Whether the risk is or has been made so small that no further pre-cautions are necessary; or
- If a risk falls between these two states so that it has been reduced to levels ALARP.

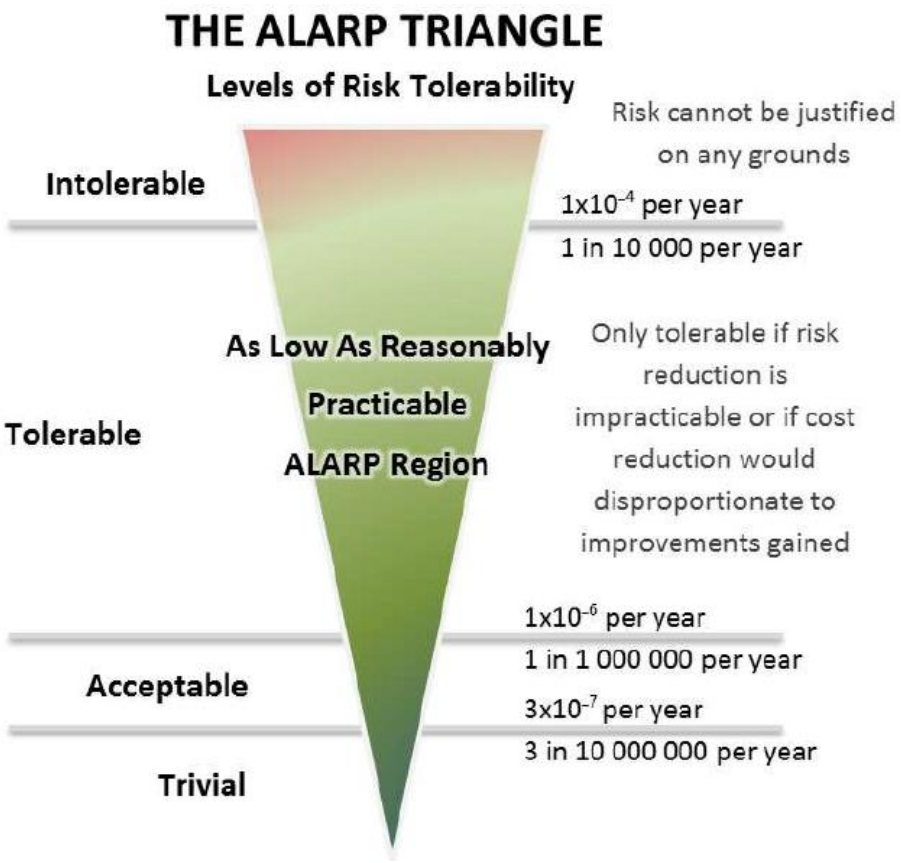

Figure 85: UK Health and Safety Executive decision-making framework

12.16.5 Key Findings of the Study

12.16.5.1 Main Hazards Due to Substance and Process

The main hazards that would occur with a loss of containment of hazardous components at the proposed Plant include exposure to:

- Toxic vapours;
- Asphyxiant vapours;
- Thermal radiation from fires; and
- Overpressure from explosions.

12.16.5.2 Establishment Tier

The MHI Regulations (2022), under Chapter 1, Chapter 2 and Chapter 3 defines the establishment tier. The listed bulk inventories of hazardous materials proposed at the facility (see Table 22 above) will exceed the threshold values and therefore qualify the proposed Plant as a Medium Tier Establishment Major Hazard Installation.

It is noted in this study that the incoming pipeline from the Transnet natural gas terminal is a Top Tier Hazard Establishment, and the MHI risk assessment must be done separately by the duty holder (not included in the scope of this study). Furthermore, the conditioning skid and the pipeline to the turbines is consider part of the “installation” and not a MHI establishment alone.

12.16.5.3 Risk Assessment

The results of the risk assessment are presented in Section 13.18.1 below.

12.16.5.4 Conclusions

Risk calculations are not precise. Accuracy of predictions is determined by the quality of base data and expert judgements.

This risk assessment included the consequences of fires and explosions, as well as toxic releases at the Plant. A number of well-known sources of incident data were consulted and applied to determine the likelihood of an incident to occur.

This risk assessment was performed with the assumption that the site would be maintained to an acceptable level and that all statutory regulations would be applied. It was also assumed that the detailed engineering designs would be done by competent people and would be correctly specified for the intended duty. For example, it was assumed that the tank wall thicknesses have been correctly calculated, that vents have been sized for emergency conditions, that instrumentation and electrical components comply with the specified electrical area classification, that material of construction is compatible with the products, etc.

It is the responsibility of the owners and their contractors to ensure that all engineering designs would have been completed by competent persons and that all pieces of equipment would have been installed correctly. All designs should be in full compliance with (but not limited to) the Occupational Health and Safety Act (Act No. 85 of 1993) and its regulations, the National Buildings Regulations and the Buildings Standards Act (Act No. 107 of 1977), as well as the local by-laws.

A number of incident scenarios were simulated, taking into account the prevailing meteorological conditions, and were described in the report.

The following installations were considered for analysis in the Quantitative Risk Assessment:

- Chlorine;
- Natural gas;
- Diesel; and
- Ammonia.

As a result of the analysis, the following were concluded:

- Consequences for the installations were analysed and assessed, with several worst-case scenarios having the potential to affect individuals located offsite. The largest of these was toxic vapour dispersion from the catastrophic rupture of a chlorine drum stored on-site. However, while the impacts could extend beyond the site boundary, no impacts would extend beyond the site boundary.
- The likelihood of failure of these installations was assessed and the combination of the consequence and the likelihood being used to calculate the overall individual risk.

- Overall, the individual risk could extend beyond the site boundary. Thus, the risks to the general public were found to be trivial.
- No new land planning should be approved without the consultation of the PADHI land-planning tables described in Appendix C of the Quantitative Risk Assessment report.
- Impact assessments of each installation were performed; each was found to be of MEDIUM SIGNIFICANCE, which can be reduced to an acceptable level with potential mitigation measures.

RISCOM did not find any fatal flaws that would prevent the project proceeding to the detailed engineering phase.

RISCOM would support the project with the following conditions:

- Compliance with all statutory requirements, i.e., pressure vessel designs;
- Compliance with applicable SANS codes, i.e., SANS 10087, SANS 10089, SANS 10108, etc.;
- Incorporation of applicable guidelines or equivalent international recognised codes of good design and practice into the designs;
- Completion of a recognised process hazard analysis (such as a HAZOP study, FMEA, etc.) on the proposed facility prior to construction to ensure design and operational hazards have been identified and adequate mitigation put in place;
- Compliance with IEC 61508 and IEC 61511 (Safety Instrument Systems) standards or equivalent to ensure that adequate protective instrumentation is included in the design and would remain valid for the full life cycle of the power plant:
  - Including the demonstration from the designer that sufficient and reliable instrumentation would be specified and installed at the facility;
- Preparation and issue of a safety document detailing safety and design features reducing the impacts from fires, explosions and flammable atmospheres to the MHI assessment body at the time of the MHI assessment:
  - Including compliance to statutory laws, applicable codes and standards and world's best practice;
  - Including the listing of statutory and non-statutory inspections, giving frequency of inspections;
  - Including the auditing of the built facility against the safety document;
- Noting that codes, such as IEC 61511 can be used to achieve these requirements;
- Demonstration by the project proponent or their contractor that the final designs would reduce the risks posed by the installation to internationally acceptable guidelines;
- Signature of all terminal designs by a professional engineer registered in South Africa in accordance with the Professional Engineers Act, who takes responsibility for suitable designs;
- Completion of an emergency preparedness and response document for on-site and off-site scenarios prior to initiating the MHI risk assessment (with input from local authorities);
- Final acceptance of the facility risks with a MHI risk assessment that must be completed in accordance to the MHI Regulations:
  - Basing such a risk assessment on the final design and including engineering mitigation.

12.17 Social Impact Assessment

A summary of the Social Impact Assessment (Nemai Consulting, 2025) follows. The specialist report is contained in **Appendix E12**.

12.17.1 Details of the Specialist

The details of the specialist that undertook the Social Impact Assessment follow.

Organisation:	Nemai Consulting
Name:	C. Chidley
Qualifications:	BA (Economics); BSc Eng (Civil); MBA

12.17.2 Objectives of the Study

The primary objectives of the Social Impact Assessment are as follows:

- Collect baseline data on the current social environment and land use in the study area;
- Analyse the social and economic implications (positive and negative) of the Project on the affected community and local economy on macro, regional, and micro(site)-levels;
- Undertake a thorough review of the minutes of public meetings and the CRR; and
- Suggest suitable mitigation measures to address the identified social impacts.

12.17.3 Methodology

the methodology combined desktop research, spatial analysis, stakeholder input, socioeconomic baseline profiling, and a structured impact assessment framework to determine the significance of social impacts and identify appropriate mitigation measure.

12.17.4 Key Findings of the Study

12.17.4.1 Impact Assessment

Refer to Section 13.22 below for the results from the impact assessment from this study.

12.17.4.2 Conclusion

The Social Impact Assessment concludes that the proposed 750 MW Gas-to-Power Plant is expected to result in both positive and negative social impacts at local, regional and national scales. The project is anticipated to improve energy security, support economic growth and create employment opportunities, but will also introduce social and environmental pressures that require management.

13 IMPACT ASSESSMENT

13.1 Introduction

This section focuses on the pertinent environmental impacts that could potentially be caused during the pre-construction, construction and operational phases of the Project.

Note that an 'impact' refers to the change to the environment resulting from an environmental aspect (or activity), whether desirable or undesirable. An impact may be the direct or indirect consequence of an activity.

Potential impacts were identified as follows:

- ❑ Impacts associated with listed activities contained in the EIA Regulations' Listing Notices;
- ❑ Impacts identified during the Scoping phase;
- ❑ An appraisal of the Project's activities and proposed infrastructure;
- ❑ An assessment of the receiving biophysical, social, economic and built environments;
- ❑ Findings from specialist studies;
- ❑ Issues highlighted by environmental authorities; and
- ❑ Comments received during public participation from I&APs.

13.2 Impacts associated with Listed Activities

As mentioned, the Project requires Environmental Authorisation for certain activities listed in the EIA Regulations, which serve as triggers for the EIA. The potential impacts associated with the key listed activities are broadly stated in Table 55 below. These impacts are further assessed in greater detail in Section 13.9 to Section 13.25 below.

Table 55: Potential Impacts associated with the key listed activities

Listed Activities	Potential Impact Overview
GN No. 327 of 7 April 2017 (Listing Notice 1)	
GN R327, Activity 11(ii) *The development of facilities or infrastructure for the transmission and distribution of electricity-* *(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or* *(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more,* *excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is-* *(a) temporarily required to allow for maintenance of existing infrastructure;* *(b) 2 kilometres or shorter in length;* *(c) within an existing transmission line servitude; and*	• Localised vegetation clearance, soil disturbance and potential erosion associated with the construction of the 275 kV switchyard, transformers and associated electrical infrastructure. • Temporary construction-related impacts, including dust, noise, traffic movements and health and safety risks. • Operational visual impacts and safety risks associated with high-voltage electrical infrastructure. • Potential contamination risks associated with transformer oil and other electrical infrastructure in the event of leaks, spills or fire incidents.

Listed Activities	Potential Impact Overview
(d) will be removed within 18 months of the commencement of development.	As mentioned, the power line for the grid connection is excluded from the Application.
GN R327, Activity 13 *The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014.*	• Localised footprint impacts associated with the development of the reservoir, including vegetation clearance, soil disturbance and potential erosion. • Increased operational water demand associated with the storage and use of water for plant requirements and fire water purposes. • Potential changes to stormwater runoff patterns and localised drainage where reservoir and associated infrastructure are developed. • Potential risk of leaks, overflow or infrastructure failure if not appropriately designed, operated and maintained. • Visual impact associated with the presence of water storage infrastructure within the industrial development footprint.
GN R327, Activity 27 *The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-* *(i) the undertaking of a linear activity; or* *(ii) maintenance purposes undertaken in accordance with a maintenance management plan.*	• Loss of habitat and biodiversity (including potential loss of faunal and floral SCC). • Soil destabilisation and subsequent erosion. • Proliferation of alien and invasive species. • Habitat fragmentation. • Sedimentation of watercourses. • Visual impacts.
GN R327, Activity 28(i) *Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:* *(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or* *(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;* *excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.*	• Permanent transformation of approximately 12.7 ha of currently undeveloped/vacant land to industrial use. • Loss of existing land capability and alteration of the site character, noting that the site is zoned for industrial use. • Construction-phase impacts including vegetation clearance, soil disturbance, dust, noise, traffic and stormwater runoff. • Operational impacts associated with industrial land use, including pollution risks, visual change, stormwater management requirements and cumulative industrialisation of the area.
GN No. 325 of 7 April 2017 (Listing Notice 2)	
GN R325, Activity 2 *The development and related operation of facilities or infrastructure for the generation of electricity from a non-renewable resource where the electricity output is 20 megawatts or more.*	• Generation of electricity from a non-renewable resource will result in atmospheric emissions, including GHG emissions and combustion-related pollutants. • Operational impacts may include noise, water demand, wastewater generation, hazardous materials use and waste generation associated with plant operation and maintenance. • Potential cumulative impacts on air quality, climate change and the industrial character of the Richards Bay area. • Potential positive impacts include electricity generation, contribution to energy security, employment creation and local economic benefits.
GN R325, Activity 4 *The development and related operation of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.*	• Storage and handling of dangerous goods during construction and operation may result in soil, surface water and groundwater contamination in the event of leaks, spills or accidental releases. • Potential major hazard risks include fire, explosion, asphyxiation, occupational health and safety risks, and emergency response requirements.

Listed Activities	Potential Impact Overview
GN R325, Activity 6 *The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding-* *(i) activities which are identified and included in Listing Notice 1 of 2014;* *(ii) activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies;* *(iii) the development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or* *(iv) where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.*	• Generation of electricity from a non-renewable resource will result in atmospheric emissions, including GHG emissions and combustion-related pollutants. • Potential human health impacts and cumulative air quality impacts within the broader Richards Bay area.
GN No. 324 of 7 April 2017 (Listing Notice 3)	
GN R324, Activity 4 – (d)(viii) *The development of a road wider than 4 metres with a reserve less than 13.5 metres.* *(d) KwaZulu-Natal* *(viii) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.*	• Development of internal roads wider than 4 m within an area designated as a CBA Irreplaceable may result in localised vegetation clearance and habitat disturbance. • Construction impacts may include soil compaction, erosion, sedimentation, dust, noise and temporary traffic or access disruption. • Operational impacts may include increased vehicle movement, edge effects, altered runoff patterns, alien invasive plant establishment and ongoing road maintenance requirements.
GN R324, Activity 10 – (d)(ix) *The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.* *(d) KwaZulu-Natal* *(ix) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.*	• Storage and handling of dangerous goods within an area designated as a CBA Irreplaceable may result in contamination risks to soil, surface water and groundwater in the event of spills, leaks or accidental releases. • Potential impacts include fire and safety risks, hazardous waste generation, and disturbance to sensitive biodiversity features within the CBA.
GN R324, Activity 12 – (d)(iv) & (v) *The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.* *(d) KwaZulu-Natal* *(iv) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;* *(v) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.*	• Loss of habitat and biodiversity (including potential loss of faunal and floral SCC). • Soil destabilisation and subsequent erosion. • Proliferation of alien and invasive species. • Habitat fragmentation. • Sedimentation of watercourses. • Visual impacts.

13.3 Comments Raised by Organs of State and I&APs

The comments raised by authorities (both regulatory and commenting) and I&APs to date during the execution of the EIA are captured in the CRR (refer to **Appendix K5**). These issues received further attention during the investigations in the EIA phase, including the environmental specialist studies.

The CRR was updated to include all comments received during the public review of the Draft EIA Report.

13.4 Project Activities

In order to understand the impacts related to the Project it is necessary to unpack the activities associated with the project life-cycle, as done in the sub-sections to follow.

13.4.1 Project Phase: Pre-construction

Some of the main Project activities, as well as high-level environmental activities, to be undertaken in the pre-construction phase are listed in Table 56 below.

Table 56: Simplified list of activities associated with pre-construction phase

Project Phase: Pre-construction
Project Activities
• Finalisation of detailed engineering design and plant layout.
• Environmental authorisation and permitting processes.
• Finalisation of water, wastewater, electricity and other utility supply agreements.
• Geotechnical, survey and other pre-construction investigations.
• Site establishment planning and contractor procurement.
• Detailed transport planning for abnormal and oversized loads.
• Vegetation clearance and site preparation planning.
• Establishment of temporary construction facilities and laydown areas.
• Review Contractor's method statements (as relevant).
• Arrangements for accommodation of construction workers (off site).
High Level Environmental Activities
• Diligent compliance monitoring against the EMPr, Environmental Authorisation, AEL, Water Use Licence (WUL), and other relevant environmental legislation, as relevant to the pre-construction phase.
• Undertake pre-construction environmental survey.
• Undertake baseline environmental monitoring.
• Barricade sensitive environmental features (as relevant).
• On-going consultation with I&APs.
• Other activities as per EMPr.

13.4.2 *Project Phase: Construction*

Some of the main Project activities, as well as high-level environmental activities, to be undertaken in the construction phase are listed in Table 57 below.

Table 57: Simplified list of activities associated with construction phase

Project Phase: Construction
Project Activities
• Construction employment.
• Clearing and grubbing of vegetation within the development footprint.
• Site levelling, earthworks and ground preparation.
• Construction of access roads and internal roads.
• Construction of foundations and structural platforms.
• Construction of the freshwater storage reservoir and associated water infrastructure.
• Installation of underground and surface services, including stormwater and wastewater infrastructure.
• Construction of the gas turbine generator foundations and buildings.
• Installation of two combustion turbine generators.
• Installation of two HRSGs.
• Installation of the steam turbine generator and air-cooled condenser.
• Construction of the control room, administration buildings and maintenance facilities.
• Installation of water treatment, demineralisation and wastewater treatment systems.
• Installation of fire protection systems, including CO_2 storage facilities.
• Installation of electrical infrastructure, including transformers and the 275 kV switchyard.
• Storage and handling of construction materials, fuels, lubricants and other hazardous substances.
• Transportation of plant components, equipment and construction materials to site.
• Testing and commissioning of plant infrastructure and systems.
High Level Environmental Activities
• Diligent compliance monitoring against the EMPr, Environmental Authorisation, AEL, WUL, and other relevant environmental legislation, as relevant to the construction phase.
• Implement Environmental Monitoring Programme.
• Reinstatement and rehabilitation of construction domain (as necessary) (outside permanent development footprint).
• On-going consultation with I&APs.
• Other activities as per EMPr.

13.4.3 *Project Phase: Operation*

Some of the main Project activities, as well as high-level environmental activities, to be undertaken in the operational phase are listed in Table 58 below.

Table 58: Simplified list of activities associated with operational phase

Project Phase: Operation
Project Activities
• Receipt and use of natural gas as the primary fuel source.
• Operation of the combustion turbine generators for electricity generation.
• Operation of the HRSGs to recover waste heat and generate steam.

Project Phase: Operation
• Operation of the steam turbine generator.
• Operation of the air-cooled condenser and steam-water cycle.
• Operation of water treatment, demineralisation and wastewater management systems.
• Operation and maintenance of the freshwater storage reservoir.
• Operation and maintenance of the 275 kV switchyard and associated electrical infrastructure.
• Storage and handling of operational chemicals, lubricants, oils, hydrogen and CO_2.
• Operation of fire protection and emergency response systems.
• Management of solid and hazardous wastes.
• Routine inspection, maintenance and repair of plant equipment and infrastructure.
• Management of stormwater, wastewater and environmental monitoring programmes.
• Export of electricity to the national grid.
• Emergency response and contingency actions.
High Level Environmental Activities
• Diligent compliance monitoring against the EMPr, Environmental Authorisation, AEL, WUL, and other relevant environmental legislation, as relevant to the operational phase
• Implement Environmental Monitoring Programme.

13.4.4 Project Phase: Decommissioning

Refer to Section 9.5.14 above. If the Plant is to be decommissioned in the future, the process will include measures to ensure compliance with prevailing regulatory requirements, as well as the rehabilitation and management of any resulting environmental impacts.

Key environmental considerations for the future decommissioning of the Plant will include:

- ❑ Demolition and removal of above-ground infrastructure, including gas turbines, HRSGs, steam turbine generators, air-cooled condensers, switchyard infrastructure, buildings and ancillary facilities.
- ❑ Removal and decommissioning of hazardous materials and chemicals, including lubricants, transformer oils, fuels, gases (e.g. hydrogen and CO_2), water treatment chemicals and other hazardous substances.
- ❑ Generation, storage, transportation and disposal of demolition waste, including hazardous and general waste streams.
- ❑ Potential contamination of soil, surface water and groundwater resulting from spills, leaks or improper handling of hazardous materials during dismantling activities.
- ❑ Increased dust generation associated with demolition, earthworks and vehicle movement.
- ❑ Increased noise and vibration associated with demolition activities and the use of heavy machinery.
- ❑ Temporary increases in traffic associated with the removal of equipment, demolition materials and waste.
- ❑ Soil disturbance, compaction and erosion associated with demolition and rehabilitation activities.
- ❑ Potential disturbance of any re-established vegetation and habitat within the site footprint.
- ❑ Rehabilitation of disturbed areas and reinstatement of site drainage patterns.
- ❑ Removal of hardstand areas, foundations and underground services where required.

- ❑ Management of contaminated soils, should any contamination be identified during decommissioning.
- ❑ Health and safety risks associated with demolition activities, working at height, confined spaces and the handling of hazardous materials.
- ❑ Opportunities for recycling and recovery of metals, equipment and construction materials to minimise waste disposal requirements.
- ❑ Visual impacts associated with demolition activities, followed by the removal of industrial infrastructure and restoration of the site.
- ❑ Long-term land rehabilitation and determination of the future land use of the site following closure.

13.5 Environmental Aspects

Environmental aspects are regarded as those components of an organisation's activities, products and services that are likely to interact with the environment and cause an impact.

The environmental aspects that have been identified for the proposed Project, which are linked to the project activities, are listed in Table 59 below. Note that only high-level aspects are provided.

Table 59: Environmental aspects associated with the project phases

Project Phase	Environmental Aspects
Pre-Construction Phase	▪ Inadequate consultation with stakeholders. ▪ Poor construction site planning and layout. ▪ Inaccurate pre-construction environmental survey. ▪ Vegetation clearing. ▪ Land occupancy by temporary buildings, provisional on-site facilities and storage areas in proximity to sensitive areas (including watercourses). ▪ Noise, dust, and vehicle emissions from site preparation activities. ▪ Risk of accidental fuel or oil spills during mobilisation of machinery. ▪ Use of existing road network and access routes. ▪ Uncovering archaeological or heritage resource during initial clearing. ▪ Inadequate environmental and compliance monitoring. ▪ Absence of relevant permits, where applicable. ▪ Poor waste management. ▪ Absence of ablution facilities.
Construction Phase	▪ Inadequate consultation with stakeholders. ▪ Inadequate environmental and compliance monitoring. ▪ Lack of environmental awareness creation. ▪ Indiscriminate site clearing. ▪ Poor site establishment. ▪ Human presence and increased activity levels. ▪ Poor management of access and use of access roads. ▪ Disruptions to traffic. ▪ Poor transportation practices. ▪ Poor fencing arrangements. ▪ Erosion. ▪ Noise, vibration, and dust from heavy machinery. ▪ Disruptions to existing services. ▪ Disturbance of topsoil. ▪ Poor management of excavations. ▪ Inadequate storage and handling of material.

Project Phase	Environmental Aspects
	▪ Inadequate storage and handling of hazardous material. ▪ Poor maintenance of equipment and plant. ▪ Poor management of labour force. ▪ Pollution from ablution facilities. ▪ Inadequate safeguarding of construction crew and the public from OHS risks. ▪ Inadequate management of construction camp. ▪ Poor waste management practices – hazardous and general solid, liquid. ▪ Wastage of water. ▪ Poor management of pollution generation potential. ▪ Damage to significant flora and fauna (if encountered). ▪ Inadequate stormwater management. ▪ Improper dewatering of excavations. ▪ Damage to cultural heritage and palaeontological features (if encountered). ▪ Disturbance of community. ▪ Poor reinstatement and rehabilitation.
Operational Phase	▪ Excessive emissions associated with power generation activities. ▪ Inappropriate operation and maintenance of gas turbines, HRSGs and associated equipment. ▪ Excessive noise generation from plant operations. ▪ Excessive artificial lighting. ▪ Inappropriate storage and handling of hazardous substances. ▪ Leakage or spillage of transformer oil, lubricating oils and hydraulic fluids, or diesel associated with emergency power systems. ▪ Leakage or release of hydrogen associated with generator cooling systems or CO_2 associated with fire protection systems. ▪ Inappropriate storage and handling of water treatment chemicals. ▪ Excessive consumption of water. ▪ Inappropriate operation of water treatment systems. ▪ Generation and inappropriate management of process wastewater. ▪ Generation and inappropriate management of sewage and sanitation systems. ▪ Inappropriate management of stormwater runoff. ▪ Inappropriate management of contaminated stormwater. ▪ Generation and inappropriate storage, handling and disposal of waste. ▪ Excessive vehicle movements associated with operation and maintenance activities. ▪ Inappropriate maintenance of plant and infrastructure. ▪ Failure of pollution prevention and containment systems. ▪ Inadequate emergency preparedness and response. ▪ Inadequate management of fire and explosion risks. ▪ Inadequate rehabilitation and maintenance of landscaped or disturbed areas. ▪ Inadequate environmental monitoring and compliance management. ▪ Inappropriate management of climate resilience and extreme weather risks. ▪ Presence and operation of permanent industrial infrastructure within the receiving environment.

13.6 Potentially Significant Environmental Impacts

13.6.1 Positive Impacts

The Project has been identified as a means of contributing to the approximately 3 000 to 6 000 MW of new gas-fired generation capacity determined as necessary under successive iterations of the IRP, procured through the GASIPPPP and/or other suitable gas-to-power procurement mechanisms.

Positive impacts are linked to the motivation for the proposed Project, which is explained in Section 3 above.

13.6.2 Negative Impacts

Note that it is not the intention of the impact assessment to evaluate all potential environmental impacts associated by the Project's environmental aspects, but rather to focus on the potentially significant direct, indirect and cumulative impacts identified during the Scoping phase and any additional issues uncovered during the EIA phase.

Table 60 below lists the potentially significant environmental impacts associated with the Project. These impacts were identified using a conservative approach, representing the possible adverse effects prior to the implementation of any mitigation measures. These potential impacts were assessed through specialist studies and considered by the engineering team, and appropriate mitigation measures were proposed. These impacts are assessed in Section 13.9 to Section 13.25 below.

Table 60: Potentially significant environmental issues

Environmental Factor	Construction Phase Potential Issues / Impacts	Operational Phase Potential Issues / Impacts
Land Use	▪ Nuisance and disruptions caused by noise, vibration, and traffic. ▪ Visual impacts.	▪ Health risks associated with gaseous emissions. ▪ Nuisance and disruptions caused by noise and vibration. ▪ Visual impacts.
Climate	▪ Emission of GHGs during construction.	▪ Climate change may impact on the proposed Project in various ways, including increased storm frequency and extreme floods events. ▪ GHG emissions associated with the combustion of natural gas, including cumulative climate change impacts.
Geology	▪ Geotechnical constraints affecting excavation, foundation design and construction.	▪ Geotechnical constraints affecting long-term infrastructure stability and maintenance.
Geohydrology	▪ The area is subject to a shallow perched water table. ▪ Potentially problematic geotechnical conditions associated with groundwater, such as groundwater seepage into excavations; ▪ Groundwater pollution due to poor construction practices.	▪ Groundwater contamination associated with chemical storage, wastewater infrastructure, hazardous materials and maintenance activities.
Topography	▪ Visual impacts caused by poor construction practices. ▪ Erosion of areas cleared for construction purposes.	▪ Visual impact caused by proposed Project infrastructure and landscape transformation. ▪ Alteration of the drainage on the site and cause an increase in runoff.
Soil	▪ Erosion, if stormwater is not adequately managed. ▪ Use of heavy equipment during the construction phase could lead to soil compaction. ▪ Soil contaminated through poor construction practices. ▪ Loss of topsoil. ▪ Impacts associated with the sourcing of construction material.	▪ Erosion may take place due to inadequate stormwater management. ▪ Soil contamination through inadequate operation and maintenance activities. ▪ Heavy equipment and structures associated with the Plant can compact soil and affect the stability of the ground. This can potentially cause localised subsidence or other stability issues.

Environmental Factor	Construction Phase Potential Issues / Impacts	Operational Phase Potential Issues / Impacts
Surface Water	▪ Sediment runoff and siltation of watercourses. ▪ Surface water contaminated through poor construction practices. ▪ Damage to the structure and functioning of the wetland to the south-west of the site due to construction activities. ▪ Introduction and spread of invasive alien plants and noxious weeds into watercourses.	▪ Accidental spills, wastewater discharges and inadequate stormwater management and discharges could impact watercourses (including the nearby canal and the wetland to the south-west of the site). ▪ Damage to infrastructure from major flood events.
Estuarine Environment	▪ Impacts to freshwater resources may adversely affect the freshwater inflows into the Richards Bay Estuary and adjacent uMhlathuze Estuary.	▪ Impacts to freshwater resources may adversely affect the freshwater inflows into the Richards Bay Estuary and adjacent uMhlathuze Estuary. ▪ Indirect impacts to estuarine ecosystem caused by emissions from the Plant.
Terrestrial Biodiversity	▪ Clearance of vegetation to be disturbed by construction activities. ▪ Habitat loss and fragmentation. ▪ Loss, disturbance or displacement of flora and fauna species, including SCC. ▪ Human - animal conflicts. ▪ Disruption/alteration of species activities due to noise and vibration. ▪ Nights lights may affect nocturnal faunal species. ▪ Illegal harvesting and poaching of faunal and floral species by construction workers. ▪ Pollution of the biophysical environment from poor construction practices. ▪ Proliferation of invasive alien species in disturbed areas.	▪ Continued encroachment of invasive alien species into disturbed areas. ▪ Offsite impacts to surrounding natural areas.
Socio-Economic Environment	▪ Influx of people seeking employment and associated impacts. ▪ Safety and security of local community during construction. ▪ Use of local road network by construction vehicles and plant. ▪ Nuisance from dust, noise, vibration and light pollution. ▪ Consideration of local labourers and suppliers in area – stimulation of local economy (positive impact). ▪ Transfer of skills (positive impact).	▪ Health risks associated with gaseous emissions. ▪ Visual impacts caused by the components of the Plant. ▪ Noise from the operation of the Plant. ▪ Risks posed by hazardous components of the Plant.
Air Quality	▪ Dust from the use of dirt roads on the site by construction vehicles. ▪ Dust from bare areas that have been cleared for construction purposes. ▪ Emissions from construction equipment and machinery. ▪ Tailpipe emissions from construction vehicles. ▪ Emission of GHG during construction	▪ Air quality deterioration as a result of gaseous emissions caused by the Plant. ▪ Emission of GHG during operational phase, including cumulative impacts. ▪ Emissions from equipment, machinery and vehicles used for the operation of the Plant.
Noise	▪ Localised increases in noise may be caused by construction activities.	▪ Operational noise associated with turbines, HRSGs, transformers, air-cooled condensers and ancillary equipment.
Agriculture	▪ Based on the location of the site within an industrial estate and the zoning of the land, no impacts are expected from an agricultural perspective.	
Historical and Cultural Features	▪ Possible direct impacts on undiscovered heritage resources as a result of ground disturbance during construction.	-
Existing Structures & Infrastructure	▪ Damage or disruption to existing infrastructure and services during construction activities.	▪ Demand of the proposed Plant on existing utility services and infrastructure.

Environmental Factor	Construction Phase Potential Issues / Impacts	Operational Phase Potential Issues / Impacts
Transportation	▪ Increase if traffic from the transportation of materials and construction personnel to site. ▪ Traffic disruptions caused by abnormal load vehicles. ▪ Speeding and reckless driving by construction personnel.	▪ Transportation of maintenance materials, and operational and maintenance staff, to the Plant.
Aesthetics	▪ Clearing of vegetation. ▪ Construction-related activities. ▪ Light pollution. ▪ Inadequate waste management and housekeeping. ▪ Inadequate reinstatement and rehabilitation of areas affected by construction activities, outside of the permanent development footprint.	▪ Visual impacts associated with large structures and other facilities associated with the Plant. ▪ Visible plumes of steam or smoke from stacks. ▪ Inadequate housekeeping and waste management during operations.
Health	▪ Hazards related to construction work with potential occupational injuries and diseases, as well as risks to community health and safety. ▪ Increased levels of dust and particulate matter. ▪ Increased levels of noise. ▪ Water (surface and ground) contamination. ▪ Poor water and sanitation. ▪ Communicable diseases. ▪ Psychosocial disorder. ▪ Safety and security. ▪ Lack of suitable health services.	▪ Hazards related to operation and maintenance work. ▪ Risks posed by hazardous components of the Plant.
Water & Wastewater	▪ Water consumption for construction activities. ▪ Impacts associated with wastewater generated during construction.	▪ Water consumption for process and domestic purposes. ▪ Impacts associated with generation of process wastewater, blowdown water, chemical wastewater, oily wastewater and sewage.
Major Hazard & Risk	▪ Storage and handling of fuels, oils and hazardous materials during construction.	▪ Fire, explosion and accidental release risks associated with natural gas infrastructure, hydrogen systems, CO_2 storage systems, diesel storage, chemicals and electrical infrastructure.

The cumulative impacts are discussed in Section 13.27 below.

The findings of the specialists are of particular importance in terms of understanding the impacts of the Project and managing these during the project life-cycle, as these studies focused on the significant environmental issues identified during the execution of the EIA. As can be seen from the various impact assessments performed by the specialists, there are a host of cross-cutting impacts that are addressed in a number of these studies. The mitigation measures proposed by the specialists for these similar types of impacts are regarded as complementary and they are aligned with best practices and principles.

13.7 Impact Assessment Methodology

The following criteria were used to determine the significance of the environmental impacts associated with the project activities:

Nature (/Status)
The project could have a **positive**, **negative**, or **neutral** impact on the environment.

Extent
- **Local** - extend to the site and its immediate surroundings.
- **Regional** - impact on the region but within the county.
- **National** - impact beyond the county.
- **International** - impact outside of South Africa.

Magnitude
Degree to which impact may cause irreplaceable loss of resources.
- **Low** - natural and social functions and processes are not affected or minimally affected.
- **Medium** - affected environment is notably altered; natural and social functions and processes continue albeit in a modified way.
- **High** - natural or social functions or processes could be substantially affected or altered to the extent that they could temporarily or permanently cease.

Duration
- **Short term** - 0-5 years.
- **Medium term** - 6-11 years.
- **Long term** - impact ceases after the execution of the project, either because of natural processes or by human intervention.
- **Permanent** - mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.

Probability
- **Almost certain** - the event is expected to occur in most circumstances.
- **Likely** - the event will probably occur in most circumstances.
- **Moderate** - the event should occur at some time.
- **Unlikely** - the event could occur at some time.
- **Rare/Remote** - the event may occur only in exceptional circumstances.

Significance
Provides an overall impression of an impact's importance and the change brought about to the receptors in the receiving environment. The range for significance ratings is as follows:

Negligible	Insignificant change to baseline conditions of the environment. No mitigation necessary.
Minor	Minimal change to baseline conditions of the environment. Low to moderate receptor sensitivity. Mitigation to be considered.
Moderate	Moderate change to baseline conditions of the environment. Moderate to high receptor sensitivity. Mitigation necessary.
Major	Significant change to baseline conditions of the environment. Moderate to high receptor sensitivity. Mitigation necessary.

In the case of the specialist studies, some of the impact assessment methodologies deviated from the approach shown above. However, the quantitative basis for these specialist evaluations of the impacts to specific environmental features still satisfied the intention of the EIA.

13.8 Impact Mitigation

13.8.1 Mitigation Hierarchy

Suitable measures were proposed to manage the identified environmental and social risks and impacts according to the following mitigation hierarchy:

1. Initial efforts strive to avoid the risk and resultant occurrence of the impact;
2. If this is not possible, mitigation includes measures that reduce or minimise the risk and the resultant significance of the impact to an acceptable level;
3. Remediation or restoration will take place if measures cannot suitably prevent or reduce the risks and resultant impacts, or to address the residual impacts; and
4. As a last measure, where significant residual impacts remain, compensation or offsets will be employed as a form of mitigating the impacts associated with the Project.

The proposed mitigation of the impacts associated with the Project includes specific measures identified by the technical team (including engineering solutions) and environmental specialists, stipulations of environmental authorities and environmental best practices.

Note that the mitigation measures in the subsequent sections are not intended to be exhaustive, but rather focus on the potentially significant impacts identified. The EMPr (contained in **Appendix I**) provides a comprehensive list of mitigation measures for specific elements of the Project and the receiving environment, which extends beyond the impacts evaluated in the body of the EIA Report.

13.8.2 EMPr Framework

An EMPr represents a detailed plan of action prepared to ensure that recommendations for enhancing positive impacts and/or limiting or preventing negative environmental impacts are implemented during the life-cycle of a project.

The EMPr for the Project, which is contained in **Appendix I**, provides a comprehensive list of mitigation measures for specific elements of the Project and the receiving environment. The content of the EMPr is based on Appendix 4 of the EIA Regulations.

All liability for the implementation of the EMPr (as well as the EIA findings and Environmental Authorisation, if granted) lies with the Applicant.

The following considerations and assumptions accompany the compilation of the EMPr for the Project:

- ❑ The EMPr is guided by the following principles, based on Lochner (2005) -
  - **Continuous improvement -** The Applicant should be committed to review and to continually improve environmental management, with the objective of improving overall environmental performance.

- **Broad level of commitment** - A broad level of commitment is required from all levels of management as well as the workforce in order for the implementation of the EMPr to be successful and effective.
- **Flexible and responsive** - The implementation of the EMPr needs to be responsive to new and changing circumstances. The EMPr report is a dynamic "living" document that will need to be updated regularly throughout the duration of the project life-cycle.

- ❑ Compliance with the EMPr must be audited in terms of Regulation 34 of the EIA Regulations.
- ❑ The EMPr provides the framework for the overarching environmental management requirements for the project life-cycle. Following detailed design and planning, the EMPr may need to be revised to render the management actions more explicit and accurate to the final project specifications. Any amendments to the EMPr must be undertaken in accordance with Regulations 35 – 37 of the EIA Regulations.
- ❑ The EMPr will be linked to the Project's overall Environmental Management System (EMS) (if applicable), where the EMS constitutes an iterative process that aims to achieve continuous improvement and enhanced environmental performance.
- ❑ While every effort has been made to ensure that the scope and level of detail in the EMPr are appropriately aligned with the environmental risks—taking into account the type and scale of the proposed activities, the sensitivity of the receiving environment, and the specific project and site conditions—some environmental management requirements have been intentionally formulated in a generic manner. This approach allows for flexibility in addressing a broader range of potential activities that may be undertaken as part of the overall Project.

13.9 Climate

The outcomes of the Climate Change Impact Assessment (Promethium Carbon, 2026) are presented below. The specialist report is contained in **Appendix E1**.

13.9.1 Impact Description

13.9.1.1 Project Contribution to Climate Change

13.9.1.1.1 GHG Emissions

The Climate Change Impact Assessment quantified the GHG emissions associated with the proposed CCPP and its associated infrastructure over the Project life-cycle. Emissions are reported as tonnes CO_2-equivalents (tCO2e) using 100-year and 20-year Global Warming Potential (GWP), consistent with international best practice.

The GHG profile is predominantly driven by the operational phase, which accounts for more than 99% of total life-cycle emissions under both the 100-year and 20-year GWP metrics. This is primarily due to the continuous combustion of natural gas for electricity generation over the assumed 20-year operational life, which represents the primary source of Scope 1 emissions and the single largest contributor to the Project's overall GHG inventory.

Construction and decommissioning activities represent a comparatively small component of total life-cycle GHG emissions, accounting for less than 1% of cumulative emissions. These emissions are primarily associated with the production and transport of construction materials and end-of-life dismantling activities and are minor when considered relative to long-term operational emissions.

From a scope perspective, direct emissions (Scopes 1 and 2), driven primarily by the combustion of natural gas for electricity generation, represent the largest share of total emissions for both gas supply scenarios. Indirect emissions (Scope 3) also contribute materially to the Project's footprint, with the most significant components arising from the upstream natural gas supply chain. These include gas extraction, processing, gathering and boosting, liquefaction, pipeline transmission, tanker transport, and regasification.

Across the GWP time horizons considered, the analysis indicates that opportunities to reduce the Project's GHG emissions are largely associated with the operational phase. Potential reductions relate to improvements in plant efficiency, optimisation of operating performance, and measures aimed at reducing emissions from the upstream natural gas supply chain. In comparison, interventions during the construction and decommissioning phases would have a relatively limited influence on the Project's overall life-cycle GHG emissions due to the comparatively small contribution these phases make to total emissions.

13.9.1.1.2 Net Emissions

Using a conservative zero-emissions baseline, the Project is estimated to result in a net life-cycle increase of approximately 92.7 million tCO_2e under the Angola LNG supply scenario and approximately 91.1 million tCO_2e under the United States LNG supply scenario. No emission reductions or removals are claimed, and the results reflect the full life-cycle emissions attributable to the Project, including operational emissions and emissions associated with carbon stock loss. This reinforces the importance of mitigation measures, particularly targeting construction materials and workforce transport, which dominate the footprint.

13.9.1.1.3 Avoided Emissions

A scenario-based assessment of avoided emissions was undertaken to provide context regarding the potential role of the proposed CCPP within the national electricity system. As future electricity dispatch patterns cannot be predicted with certainty, no assumption was made that the Project would directly replace coal-fired generation. Instead, illustrative scenarios were assessed in which the facility either displaces coal-fired electricity generation or supports increased renewable energy penetration through the provision of dispatchable generation capacity.

The assessment indicated that, under these hypothetical scenarios, the Project could contribute to substantial system-level emissions reductions relative to higher-emission generation sources. These outcomes are illustrative only and do not represent guaranteed or directly attributable emission reductions resulting from the Project.

13.9.1.1.4 Assessment of Potential Alternatives

A high-level assessment of alternatives was undertaken to determine whether other technologies or fuels could reasonably fulfil the same role as the proposed Project, namely providing large-scale, dispatchable electricity generation to support grid reliability.

Renewable energy technologies were recognised as important components of South Africa's future energy mix but were not considered direct substitutes for dispatchable generation at the required scale without substantial additional storage and transmission infrastructure. Nuclear power was found to have low operational emissions but was considered impractical due to high costs, regulatory complexity and long development timeframes. Coal-fired generation was rejected due to its significantly higher GHG emissions and environmental impacts.

Alternative gas-fired technologies, including open-cycle gas turbines and internal combustion engine power plants, were assessed but found to be less efficient and more emissions-intensive than combined cycle technology. Alternative fuels, including hydrogen, biomethane, synthetic fuels and propane, were also considered but were not regarded as feasible due to limitations relating to availability, infrastructure, cost and supply security.

The assessment concluded that modern LNG-fuelled CCGT technology represents the most appropriate and feasible option for achieving the Project's objectives, providing the highest efficiency, lowest emissions intensity among commercially available gas-fired technologies, and sufficient operational flexibility to support grid stability and renewable energy integration. The no-go alternative would avoid Project-related emissions but may reduce the availability of dispatchable generation capacity required to support the national electricity system.

13.9.1.1.5 Cumulative Impact within the National Policy Context

The proposed Project was assessed within the context of South Africa's national electricity planning, procurement and climate policy framework.

The Project's estimated greenhouse gas contribution must be considered within the context of South Africa's national emissions trajectory and mitigation commitments. The Project's estimated annual emissions of approximately 3.7 million tCO2e would represent about 0.9% of the 2030 Nationally Determined Contribution (NDC) upper limit of 420 million tCO2e and about 1.2% of the 2035 lower-limit trajectory of 320 million tCO2e. While this constitutes a relatively small contribution in national terms, the Project would add to South Africa's overall emissions burden and must therefore be considered within the context of the country's climate commitments and emissions reduction objectives

The assessment concludes that the Project is broadly consistent with current energy planning frameworks, including the IRP 2025, which continues to provide for dispatchable gas-fired generation. Nevertheless, policy alignment does not predetermine approval, and decision-making

must consider the Project's emissions, cumulative climate implications, alternatives and broader environmental acceptability in terms of NEMA.

13.9.1.2 Project Vulnerability to Climate Change

13.9.1.2.1 Vulnerability Assessment

The following table provides an overview of the potential climate change impacts that may affect the resilience of the proposed Project. This summary serves to highlight the areas of vulnerability and inform the identification of appropriate adaptation and risk management measures throughout the Project's lifecycle.

Table 61: Summary of the potential climate change impacts on the resilience of the Project (Promethium Carbon, 2026)

Operational component	Climate risk	Potential impacts
Core operations	Increased temperatures	• Heat stress on equipment • Fugitive emissions • Material fatigue
	Increased rainfall/ flooding	• Overwhelmed stormwater systems • Site access delays • Structural damage
	Drought	• Strain on municipal supply • Impaired cooling/emergency systems
Value Chain	Increased rainfall (flooding)	• Pipeline corrosion • Road damage • Delivery delays
	Storm surges	• Port operations disruption
	Extreme weather events	• Transport route disruption • Increased insurance and adaptation costs
Social environment	Extreme weather evens	• Water stress for communities • Public health risks • Service delivery pressure
Natural environment	Extreme weather events	• Coastal erosion • Wetland degradation • Habitat loss
	Drought	• Reduced ecological function • Wetland carbon sequestration loss

13.9.1.2.2 Project Vulnerability Assessment

The assessment shown in Figure 86 below is based on a timeline up to 2050. The risks of rainfall changes and rainfall intensity are difficult to predict, being stochastic in nature, and with inherent uncertainty in future projections for these. If they do occur, these events could pose the most significant impacts on the Project. Mitigating these will largely depend on the adaptive capacity of the Project and its proponent, as well as important stakeholders.

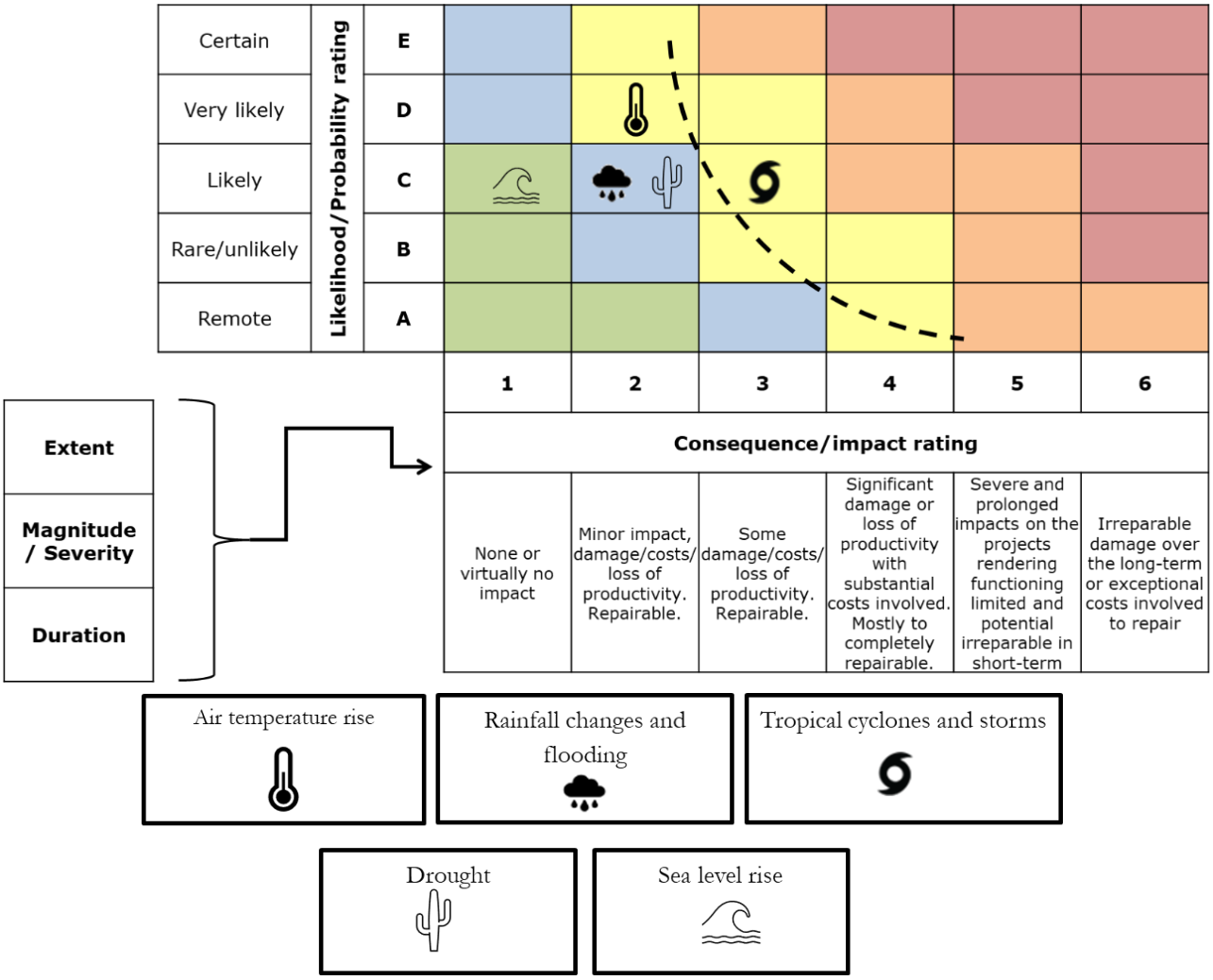

Figure 86: The proposed Project vulnerability assessment outcome (Promethium Carbon, 2026)

The assessment indicates that the Project is exposed to the following vulnerabilities:

1. **Air temperature rise and extreme temperatures**: Temperature increases averaged across the district in the near-future are virtually certain and may be as high as 1.5 °C. Under a low mitigation scenario, further temperature increases are virtually certain and may approach 2.5 °C in the mid-future and 4.0 °C in the far-future. Increases in average temperature will be accompanied by increases in warm temperature extremes such as heatwaves and high fire danger days (virtually certain). Elevated ambient temperatures may impact worker health and safety, reduce labour productivity, and increase the cooling load for sensitive equipment. The overall risk is considered moderate, as the anticipated temperature increases are incremental and can be managed through standard occupational health and site design measures.
2. **Rainfall changes and rainfall intensity**: intense rainfall events are projected to become more frequent (high confidence), even where the direction of change in total annual rainfall remains uncertain. Heavy rains could affect key operational processes (e.g., loading/unloading, maintenance of equipment) as well as storage (flooding of terminals). Extreme rainfall events may temporarily overwhelm stormwater infrastructure, resulting in short-term inundation of low-lying areas and potential impacts on electrical and ancillary infrastructure. These risks are

moderate, with impacts likely to be short-term and repairable, although they could affect insurance costs and contingency planning.

3. **Sea level rise**: The proposed CCPP is to be located inland and is not expected to be directly impacted by sea level rise over its operational life. However, reliance on the PoRB introduces indirect exposure. Long-term sea level rise may amplify storm surges during extreme weather events, potentially affecting port operations and LNG delivery schedules. The risk to the project site is low, but upstream dependencies warrant consideration in resilience planning.
4. **Tropical cyclones and storms**: the likelihood of HILP events are difficult to determine due to the stochastic nature of these extreme events. Though the probability of occurrence is low, the potential consequences are high. Business continuity planning and structural resilience measures are necessary to mitigate these risks, particularly for port and transport infrastructure dependencies.
5. **Water stress and drought**: The Project is not a water-intensive facility, but some processes, such as vapouriser cooling, cleaning, and fire suppression, require reliable water access. Drought and increased evaporation may stress municipal supply systems. The overall water risk is low, but resilience planning should account for extended dry periods.

The vulnerabilities identified for the Project are not isolated; they often interact in ways that can amplify overall risk. For example, increased temperatures can exacerbate water stress, as higher evaporation rates reduce water availability, potentially impacting both cooling processes and employee health. Similarly, sea level rise, while a long-term concern, can magnify the effects of storm surges and coastal flooding during extreme weather events like tropical cyclones. These events can damage critical infrastructure, disrupt supply chains, and strain the Project's operational resilience.

13.9.1.2.3 Project Mitigation and Adaptation Recommendations

In line with international best practice, including the principles set out in IFC Performance Standard 1, climate change mitigation and adaptation considerations should be integrated into the design, construction, and operation of the proposed CCPP.

The measures outlined below are non-binding recommendations intended to support informed decision-making and the progressive management of climate-related risks and impacts. They do not constitute proposed conditions of authorisation and would be subject to technical feasibility, operational requirements, and commercial considerations.

The following measures are aimed at limiting the Project's emissions within the scope of influence of a gas-fired CCPP, with emphasis on operational efficiency and good construction practice:

- Optimise plant efficiency through combined cycle operation, appropriate turbine selection, and operational controls to minimise fuel use and emissions per unit of electricity generated.
- Implement energy-efficient design and equipment selection for auxiliary systems, including motors, pumps, compressors, and lighting, to reduce indirect electricity demand during operation.

- Apply good practice construction management measures to limit emissions during construction, including efficient equipment use, minimisation of idling, and consolidation of material deliveries where feasible.
- Maintain regular inspection, maintenance, and performance optimisation of turbines, heat recovery systems, and auxiliary equipment to ensure sustained operational efficiency and minimise emissions over the plant lifecycle.
- Implement leak detection and repair (LDAR) programmes to identify and minimise fugitive methane emissions from gas handling and associated infrastructure.
- Prioritise local or regional sourcing of bulk construction materials, where practicable, to reduce transport-related emissions and support regional economic activity.
- Maintain transparent monitoring and reporting of operational emissions, to support ongoing emissions management and regulatory reporting requirements.

The following measures are recommended to enhance the Project's resilience to identified physical climate risks, including extreme rainfall, flooding, coastal climatic influences, and heat stress:

- Incorporate climate change considerations into site layout and detailed design, ensuring that critical infrastructure is positioned on suitably elevated and engineered platforms within the relatively flat coastal plain. Site grading should account for low relief (±40–43 m above mean sea level) and minimise localised ponding and flood risk.
- Design stormwater systems to integrate with existing RBIDZ infrastructure, including the stormwater canal along the western boundary of the site. Systems should be sized to accommodate increased rainfall intensity and ensure controlled discharge without overloading downstream channels.
- Although no rivers traverse the site, runoff is conveyed via the stormwater canal to downstream watercourses. Design measures should therefore ensure attenuation, flow control, and water quality management to prevent increased flooding or erosion risks downstream under extreme rainfall events.
- Given the flat topography and expected increase in runoff due to hard surfaces, the implementation of erosion control and flow dissipation measures (e.g. attenuation ponds, swales, energy breakers) to maintain pre-development hydrological conditions and avoid sediment transport, should be considered.
- Select materials and equipment suitable for high humidity (~80%), saline air influence, and moderate coastal wind regimes. Corrosion-resistant materials and protective coatings should be prioritised to maintain plant integrity and reduce lifecycle maintenance risks.
- Confirm availability and reliability of bulk water services for plant operations and auxiliary uses, and incorporate water efficiency and reuse measures where feasible, recognising dependence on regional infrastructure and potential climate-related supply variability.
- Integrate climate-related risks (e.g., intense rainfall, flooding, heatwaves, infrastructure failure) into emergency preparedness and response planning, ensuring that response systems remain functional under extreme conditions and align with plant safety requirements.

- Engage with RBIDZ management and relevant authorities to ensure alignment of stormwater management, infrastructure resilience, and emergency response systems across the broader industrial zone

13.10 Air Quality

The outcomes of the Air Quality Impact Assessment (uMoya-NILU, 2026) are presented below. The specialist report is contained in **Appendix E2**.

13.10.1 Impact Description

13.10.1.1 Construction Phase

Activities during construction are associated with the movement of vehicles and equipment including bulldozers, excavators and tipper trucks. All aspects of construction inherently generate dust, but the movement of construction vehicles on the unpaved surfaces at the construction site are generally the largest source of dust. Dust is also easily entrained from exposed areas by wind.

At this stage there is insufficient information to estimate dust emissions from the construction phase as they require specific information on the nature and duration of the activities as well as the equipment and vehicles. The assessment of air quality impacts during construction is therefore qualitative.

A summary of the impact scores is presented in Table 62 below.

13.10.1.2 Operational Phase

The air quality impacts for the operational phase assessed the 4 scenarios explained in Section 12.5.4.3 above.

The following three scenarios were also assed qualitatively:

- Emergency Shutdown
- Black-start scenario
- Backup diesel operation

For Scenarios 1 and 2, emissions from the proposed Mabasa CCPP operating in Simple and Combined cycle modes predicted ambient SO_2, NO_2, PM_{10} and CO concentrations are low. The predicted ambient concentrations for the Combined Cycle mode are somewhat higher than for Simple Cycle mode. The associated impact for both scenarios is low.

For Scenarios 3, emissions from the proposed Mabasa CCPP operating in Combined Cycle mode with the contribution of other industries. This is a hypothetical case for two reasons. One, the suite of industries generally operates below the permitted maximum emissions, and two, it is unlikely,

but not impossible, that the suite of industries simultaneously emits at the permitted maximum concentration. Using the permitted maximum emissions rather than actual emissions therefore present a possible worst-case scenario. The predicted ambient SO_2, NO_2 and PM_{10} concentrations exceed the NAAQS, and the cumulative assessments of other industries with the Mabasa CCPP is predicted to be medium. A medium rating is applied considering the hypothetical nature of the emissions used. Note that the relative contribution from the Mabasa CCPP to this scenario is low.

For Scenarios 4, emissions from the proposed Mabasa CCPP operating in Combined Cycle mode with the contribution of other industries and approved projects, the predicted ambient SO_2, NO_2 and PM_{10} concentrations exceed the NAAQS. This is also a hypothetical case for a few reasons. Firstly, the suite of industries generally operates below the permitted maximum emissions. Secondly, the approved projects are natural gas projects and will operate well below the MES for SO_2 and particulates due to the nature of natural gas. Lastly, but not impossible that the suite of industries simultaneously emits at the permitted maximum concentration. Using the permitted maximum emissions rather than actual emissions therefore present a possible worst-case scenario. The predicted ambient concentrations for Scenario 4 are somewhat higher than for Scenario 3. In other words, the collective of the approved projects has a relatively small additive effect to industries assessed. The cumulative assessments of other industries and approved projects with the Mabasa CCPP is predicted to be medium. A medium rating is applied considering the hypothetical nature of the emissions used. Note that the relative contribution from the Mabasa CCPP to this scenario is low.

Three additional operating scenarios were assessed qualitatively, namely emergency shutdown, black-start and backup diesel operation. These scenarios involve the use of ULSD for relatively short and infrequent periods, with backup diesel operation representing a contingency measure in the event of a natural gas supply interruption. While these scenarios would result in temporary atmospheric emissions, their infrequent occurrence and limited duration are expected to constrain their potential impact on ambient air quality. The associated air quality impacts are therefore considered to be of low significance.

Natural gas is clean fuel containing very low sulphur and has a very low particulate content. Air quality management interventions in the form of the control of emission have been considered in all aspects of design and operation for the Mabasa CCPP. Apart from Dry Low-NOx burners to control NO_X emissions, further emission reduction interventions are deemed to be unnecessary considering the low impact of the proposed project on air quality. From an air quality perspective, it is the reasonable opinion of the authors that the proposed Mabasa CCPP should be authorised considering the findings of this AIR.

13.10.2 Impact Assessment

A summary of the impact scores is presented in Table 62 below.

Table 62: Air quality impact ratings (uMoya-NILU, 2026)

Description	Pollutants	Severity or magnitude	Spatial scale	Duration	Frequency of activity	Frequency of incident/impact	Legal issues	Detection	Consequence	Likelihood	Significance	Irreplaceability	Reversibility
Construction Phase	Dust	2	1	2	5	1	5	2	5	13	Low (-65)	Low	High
Scenario 1: Operation of Mabasa CCPP in Simple cycle mode	SO_2	2	2	3	5	1	5	2	7	13	Low (-91)	Low	High
	NO_2	2	2	3	5	1	5	2	7	13	Low (-91)	Low	High
	PM_{10}	2	2	3	5	1	5	2	7	13	Low (-91)	Low	High
	CO	2	2	3	5	1	5	2	7	13	Low (-91)	Low	High
Scenario 2: Operation of Mabasa CCPP in Combined cycle mode	SO_2	4	2	3	5	1	5	2	9	13	Low (-117)	Low	High
	NO_2	2	2	3	5	1	5	2	7	13	Low (-91)	Low	High
	PM_{10}	2	2	3	5	1	5	2	7	13	Low (-91)	Low	High
	CO	2	2	3	5	1	5	2	7	13	Low (-91)	Low	High
Scenario 3: Operation of Mabasa CCPP with existing sources (cumulative)	SO_2	8	3	4	5	1	5	2	15	13	Medium (-195)	Low	High
	NO_2	8	3	4	5	1	5	2	15	13	Medium (-195)	Low	High
	PM_{10}	8	3	4	5	1	5	2	15	13	Medium (-195)	Low	High
Scenario 4: Operation of Mabasa CCPP with existing sources and future approved projects (cumulative)	SO_2	8	3	4	5	1	5	2	15	13	Medium (-195)	Low	High
	NO_2	8	3	4	5	1	5	2	15	13	Medium (-195)	Low	High
	PM_{10}	8	3	4	5	1	5	2	15	13	Medium (-195)	Low	High
Emergency Shutdown	SO_2/NOx/PM_{10}/CO	2	2	1	1	1	5	3	5	10	Low (-50)	Low	High
Black-start	SO_2/NOx/PM_{10}/CO	2	2	1	1	1	5	3	5	10	Low (-50)	Low	High
Backup diesel operation	SO_2/NOx/PM_{10}/CO	4	2	1	1	1	5	3	7	10	Low (-70)	Low	High
Decommissioning Phase	Dust	2	1	2	5	1	5	2	5	13	Low – 65	Low	High

13.10.3 Mitigation Measures

Construction phase

Control measures for dust include:

- Strict enforcement of speed limits on all site roads
- Routine water spraying of site roads and denuded/disturbed areas (more frequent spraying may be necessary during dry, windy conditions)
- Removal of vegetation only if necessary
- Revegetation or paving of disturbed areas once construction activities are complete.

Operational Phase

Air quality management interventions in the form of the control of emission will be considered in all aspects of design and operation.

Air quality monitoring and reporting requirements will be specified in the AEL. Typically, these will include, amongst others:

- Routine isokinetic stack emission measurements to demonstrate compliance with the Minimum Emission Standards.
- The annual compilation of an emission inventory report and submission to the National Atmospheric Emission Inventory System (NAEIS).
- The annual compilation of a Greenhouse Gas emission inventory report and submission to the South African Greenhouse Gas Emission System (SAGERS).
- The compilation of an annual AEL performance report.

Continuous Emissions Monitoring Systems (CEMS) will be installed on all stacks at the power plant, consistent with standard industry practice.

Fugitive emissions from natural gas equipment are not expected to be a significant source of emissions under normal operation. Gas sensors/detectors will be installed around the gas-handling equipment to detect small leaks, including potential valve gland leaks. These form part of the plant's safety and leak-detection systems. The potential for fugitive emissions will be managed through the plant's gas detection and leak-detection systems and the associated operational and maintenance procedures.

13.11 Geology & Hydrogeology

13.11.1 Impact Description

Geotechnical constraints at the site include the following (Engeolab, 2024):

- A densely rooted profile is present in the top 1m of cover soils;
- The area is subject to a shallow perched water table;
- The sandy cover soils tend to be highly permeable;

- ❑ Deep compaction of foundation materials is inhibited by a shallow perched water table;
- ❑ A competent shallow founding horizon for movement-sensitive structures is not present on site;
- ❑ Immediate collapse of excavations occurs within very moist to wet material >1.5m;
- ❑ Site soils are highly compressible and hence susceptible to settlements;
- ❑ Founding material characterised by a low bearing capacity;
- ❑ Good quality pavement construction materials need to be imported;
- ❑ Light structures should preferably be found on raft foundations with light reinforcing in masonry; and
- ❑ Heavy, vibrating structures need to be found on piles.

The primary geology-related concern is the suitability of the founding conditions for large industrial infrastructure rather than direct environmental effects. In contrast, the primary geohydrological impact relates to the potential contamination of shallow groundwater resources due to the presence of a highly permeable soil profile, shallow perched groundwater and the storage and handling of fuels, oils, chemicals and wastewater during both the construction and operational phases.

13.11.2 Impact Assessment

Theme	**Geology**
Relevant Alternatives & Activities	**All physical infrastructure that forms part of the Project**
Project life-cycle	**Construction and operational phases**
Proposed Management Objectives / Mitigation Measures	
▪ Detailed geotechnical investigations must be undertaken during detailed design to confirm foundation requirements for all major infrastructure. ▪ Implement recommendations from the Geotechnical Investigations to overcome any geotechnical constrains encountered at the site. ▪ Foundation systems must be designed by a suitably qualified geotechnical engineer. ▪ Heavy and vibration-sensitive structures (including gas turbines, HRSGs, steam turbine generators and transformers) should be founded on appropriately designed pile foundations or other suitable engineered solutions. ▪ Ground improvement measures must be implemented, where required. ▪ Excavations deeper than recommended depths must be battered, benched, shored or otherwise stabilised. ▪ Earthworks should be planned to minimise the exposure of excavated areas during periods of heavy rainfall. ▪ All foundations, platforms and infrastructure must be constructed in accordance with approved engineering specifications. ▪ Settlement monitoring should be undertaken where required for critical infrastructure.	

	+/- Impacts	**Extent**	**Magnitude**	**Duration**	**Probability**	**Significance**
Before Mitigation	-	local	medium	long-term	likely	Moderate
After Mitigation	-	local	low	short-term	unlikely	Minor

Theme	**Geohydrology**
Relevant Alternatives & Activities	**Construction and operational activities**

Project life-cycle	Construction and operational phases
Proposed Management Objectives / Mitigation Measures	
▪ Implement all recommendations contained in the Geotechnical Assessment. ▪ Excavations intercepting groundwater must be appropriately dewatered and controlled. ▪ Water removed during dewatering must be discharged via appropriately designed sediment traps and erosion-control measures. ▪ All storage tanks containing hazardous materials must be placed in bunded containment areas with impermeable surfaces. The bunded area must be able to contain 110% of the total volume of the stored hazardous material. ▪ Refuelling and maintenance activities must occur only in designated controlled areas. ▪ Spill kits must be available at all hazardous substance storage, handling and refuelling areas. ▪ All spills and leaks must be immediately contained and remediated. ▪ Process wastewater, oily wastewater, chemical wastewater and contaminated stormwater must be contained and managed through the approved wastewater management system. ▪ Tanks, pipelines, pumps, transformers and wastewater systems must be routinely inspected and maintained. ▪ Stormwater and wastewater systems must remain separated throughout the operational phase. ▪ Personnel must be trained in groundwater pollution prevention and spill response. ▪ Any abstraction of groundwater must comply with the requirements of the National Water Act (Act No. 36 of 1998). ▪ Consider periodic groundwater monitoring where large quantities of hazardous materials are stored or handled.	

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	local	high	long-term	likely	Moderate
After Mitigation	-	local	low	long-term	unlikely	Minor

13.12 Soils

13.12.1 Impact Description

Potential impacts to soil during the construction phase include:

- ❑ Loss of topsoil;
- ❑ Soil erosion resulting from vegetation clearance and earthworks;
- ❑ Soil compaction caused by construction vehicles and heavy equipment;
- ❑ Soil contamination resulting from spills or leaks of fuels, oils, concrete products, chemicals and hazardous substances; and
- ❑ Degradation of soil quality due to poor waste and stormwater management practices.

Potential impacts to soil during the operational phase include:

- ❑ Soil contamination associated with the storage and handling of transformer oil, diesel, lubricants, chemicals and wastewater;
- ❑ Localised erosion caused by poorly managed stormwater runoff;
- ❑ Degradation of soil quality due to leaks, spills or failures of containment systems; and
- ❑ Localised compaction and disturbance associated with maintenance activities.

13.12.2 Impact Assessment

Theme	Soils
Relevant Alternatives & Activities	Construction and operational activities
Project life-cycle	Construction and operational phases

Proposed Management Objectives / Mitigation Measures

- Clearly demarcate the approved development footprint and minimise unnecessary disturbance of soils.
- Strip and stockpile topsoil separately from subsoil, and protect stockpiles against erosion and contamination.
- Implement erosion and sediment control measures in all disturbed areas.
- Minimise the extent and duration of exposed soil surfaces.
- Stabilise and rehabilitate disturbed areas as soon as practicably possible.
- Ensure construction vehicles and heavy equipment remain on designated access routes where possible.
- Implement stormwater management measures to prevent erosion and scouring.
- All storage tanks containing hazardous materials must be placed in bunded containment areas with impermeable surfaces. The bunded area must be able to contain 110% of the total volume of the stored hazardous material.
- Maintain spill kits at all refuelling, maintenance and hazardous material storage areas.
- Immediately contain and remediate all spills and leaks.
- Dispose of contaminated soil at a suitably licensed facility.
- Separate contaminated and uncontaminated stormwater runoff.
- Inspect and maintain all chemical storage areas, pipelines, tanks, transformers and wastewater infrastructure.
- Implement routine housekeeping and environmental inspections during both construction and operation.
- Undertake rehabilitation and revegetation of temporarily disturbed areas following construction.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	local	medium-high	long-term	likely	Moderate
After Mitigation	-	local	low	medium-term	unlikely	Minor

13.13 Hydrology

The outcomes of the Hydrology Assessment (GCS, 2026). The specialist report is contained in **Appendix E7**.

13.13.1 Impact Description

The identified possible hydrological impacts for the construction phase include:

- The destruction of the vadose zone sediments by clearing activities (levelling) or cut and fill activities. This could lead to sediment runoff and surface water contamination;
- Clearing topsoil from footprint areas will influence the rate of infiltration of water to the shallow groundwater system and/or baseflow component to shallow streams;
- Handling of waste and transport of material can cause various types of spills (i.e. hydrocarbons) which can infiltrate and contaminate the soils and groundwater system; and

- Oil and fuel spills and leakages at vehicle park areas, and in the project areas, may cause poor-quality seepage and soil contamination.

The identified possible hydrological impacts for the operational phase include:

- Poor quality runoff from -
  - Sedimentation due to exposed soils or unvegetated surface runoff during storm events;
  - Contaminant leaks that are uncontained; and
  - Oil and fuel spills from service vehicles accessing and undertaking maintenance work at the site, as well as leakages from residential vehicles parked at the site.

13.13.2 Impact Assessment

The potential hydrological impacts identified and environmental significance for the construction and operational phases of the Project are summarised in Table 63 and Table 64, respectively.

Table 63: Construction phase hydrological risks (GCS, 2026)

Component Being Impacted On	Activity Which May Cause the Impact	Activity	PRE-MITIGATION							RECOMMENDED MITIGATION MEASURES	POST-MITIGATION						
			Duration (D)	Extent (E)	Potential for impact on irreplaceable resources (I)	Severity (S)	Consequence (C)	Probability (P)	Significance		Duration (D)	Extent (E)	Potential for impact on irreplaceable resources (I)	Severity (S)	Consequence (C)	Probability (P)	Significance
Vadose zone soils and subsequent aquifer (groundwater table)	Disturbing vadose zone soils during excavations/construction activities.	Net Result of Earthworks and Development	Medium-term 3	Site 2	Yes 1	Moderate -2	Slightly detrimental (-7 to -12) -12	Definite 2	Low (-13 to -24) -24	• Only excavate areas applicable to the project area. • Backfill the material in the same order it was excavated to reduce contamination of deeper soils with shallow oxidised soils. • Cover excavated soils with a temporary liner to prevent contamination. • Retain as much indigenous vegetation as possible. • Exposed soils are to be protected using a suitable covering or revegetation.	Medium-term 3	Site 2	Yes 1	Low -1	Negligible (-6 to 0) -6	Probable 1	Neutral (0 to -12) -6
	Poor quality seepage from machinery used to excavate soils. Oil, grease and fuel leaks could lead to hydrocarbon contamination of the vadose zone, which could percolate into the shallow aquifer.	Net Result of Earthworks and Development	Medium-term 3	Site 2	Yes 1	Moderate -2	Slightly detrimental (-7 to -12) -12	Definite 2	Low (-13 to -24) -24	• Park heavy machinery in lined and bunded areas and place drip trays under vehicles at the site. • Visual soil assessments for signs of contamination during construction (monthly)	Medium-term 3	Site 2	Yes 1	Low -1	Negligible (-6 to 0) -6	Probable 1	Neutral (0 to -12) -6
Primary Surface Water Receivers • Non-perennial streams • Riparian habitats	***Runoff*** Erosion and sedimentation of nearby canal due to potential dirty water runoff from • Excavations • Construction • Vegetation removal	Net Result of Earthworks and Development	Medium-term 3	Site 2	Yes 1	Moderate -2	Slightly detrimental (-7 to -12) -12	Definite 2	Low (-13 to -24) -24	• Install a temporary cut-off trench to contain poor-quality runoff. • Visual inspections of all vehicles entering and operating at the site. • Visual assessment for signs of erosion or contamination. • Implementation of stormwater recommendations. • Cover any temporary construction material stockpiles.	Medium-term 3	Site 2	Yes 1	Low -1	Negligible (-6 to 0) -6	Probable 1	Neutral (0 to -12) -6

Table 64: Operational phase hydrological risks (GCS, 2026)

Component Being Impacted On	Activity Which May Cause the Impact	Activity	PRE-MITIGATION							RECOMMENDED MITIGATION MEASURES	POST-MITIGATION						
			Duration (D)	Extent (E)	Potential for impact on irreplaceable resources (I)	Severity (S)	Consequence (C)	Probability (P)	Significance		Duration (D)	Extent (E)	Potential for impact on irreplaceable resources (I)	Severity (S)	Consequence (C)	Probability (P)	Significance
Vadose zone soils and subsequent aquifer (groundwater table)	Poor quality seepage from visitors and staff/site vehicles. Oil, grease and fuel leaks could lead to hydrocarbon contamination of the vadose zone which could percolate into the shallow aquifer.	Site activities	Long-term 4	Site 2	Yes 1	Low -1	Slightly detrimental (-7 to -12) -17	Definite 2	Low (-13 to -24) -14	• Park vehicles in lined and bunded areas and place drip trays under site vehicles. • Ensure a stormwater management plan is in place to capture and treat runoff from parking areas and prevent discharge into the environment or spills. • Visual soil assessments for signs of contamination during operations (monthly)	Long-term 4	Site 2	Yes 1	Low -1	Slightly detrimental (-7 to -12) -17	Probable 1	Neutral (0 to -12) -6
Primary Surface Water Receivers • Non-perennial streams • Riparian habitats	***Runoff*** Increased runoff due to compacted surfaces from the proposed site onto the surrounding soils may cause higher velocities and frequency of occurrence and sediment transport to the nearby streams.	Site activities	Long-term 4	Local 3	Yes 1	Low -1	Slightly detrimental (-7 to -12) -8	Probable 1	Neutral (0 to -12) -8	• Release structures for stormwater runoff from the site must dissipate energy and disperse flow to ensure minimal impact on the receiving environment.	Long-term 4	Local 3	No 0	Low -1	Slightly detrimental (-7 to -12) -7	Improbable 0	Neutral (0 to -12) 0
	Sedimentation Potential sedimentation several months after the site has been constructed. It is anticipated that the sediment load will decrease with time to pre-construction levels.	The net result of earthworks	Long-term 4	Local 3	Yes 1	Low -1	Slightly detrimental (-7 to -12) -8	Probable 1	Neutral (0 to -12) -8	• Release structures for stormwater runoff from the site should incorporate silt traps to allow for the settlement of sediments. • Silt traps are to be regularly cleaned.	Long-term 4	Local 3	No 0	Low -1	Slightly detrimental (-7 to -12) -7	Improbable 0	Neutral (0 to -12) 0
	Water quality Water quality impacts due to chemical spills, vehicle pollutants, fuel and oil spillages and leaks.	Site activities	Long-term 4	Site 2	Yes 1	Low -1	Slightly detrimental (-7 to -12) -7	Probable 1	Neutral (0 to -12) -7	• Implementation of the stormwater management plan. • Visual assessment for signs of contamination. • Spills are to be cleaned up immediately. • Vehicles and equipment are to be regularly maintained and cleaned.	Long-term 4	Footprint 1	Yes 1	Low -1	Slightly detrimental (-7 to -12) -6	Probable 1	Neutral (0 to -12) -6

13.13.3 Mitigation Measures

Construction phase

- ❑ A stabilised site access must be established and, if possible, limited to one point only. The access allows construction vehicles to enter the work area while preventing unnecessary sediment tracking into the nearby environment from multiple locations. A stabilised entry/exit point normally consists of a stabilised rock pad.
- ❑ Prevent erosion and manage stockpiles:
  - Suitable material storage areas must be located up-slope of the main sediment barrier (e.g., sediment fence).
  - Stockpiles kept on site for more than two weeks will require an impervious cover (e.g., builder's plastic or geofabric) to protect against raindrop impact. Stockpiles of sandy material located behind a sediment fence will only require a protective cover if they are likely to be exposed to strong winds.
- ❑ Manage site waste:
  - Adequate waste containers must be provided on-site and maintained in a way that potential and actual environmental harm resulting from such material waste is minimised.
  - Building activities must be carried out on a pervious surface, such as grass or open soil, or in such a manner that all sediment-laden runoff is prevented from discharging into a water body.
- ❑ Ensure that eroded areas are re-vegetated, to ensure reduced sedimentation risk and reduced runoff volumes to the streams.
- ❑ Manage stormwater runoff, as specified by the contracted civil engineer.
- ❑ Park heavy machinery in lined areas and place drip trays under vehicles at the site.
- ❑ Backfill the material in the same order it was excavated to reduce contamination of deeper soils with shallow oxidised soils.
- ❑ Retain as much indigenous vegetation as possible.
- ❑ Exposed soils are to be protected using a suitable covering or revegetation.
- ❑ Visual soil assessments for signs of contamination during construction (monthly).

Operational phase

- ❑ Have oil and fuel cleanup kits on site.
- ❑ Clear any sandy deposits and debris that collect in the stormwater systems.
- ❑ Routine hydraulic monitoring of the stormwater system (monthly)

13.14 Aquatic Biodiversity

The outcomes of the Freshwater Ecosystem Assessment (SAS, 2026) (contained in **Appendix E3**) are presented below.

13.14.1 Impact Description

An EA (Ref: 14/12/16/3/3/2/665) and associated Water Use Authorisation were previously granted for RBIDZ Phase 1F, which included the infilling of wetlands and the development of service infrastructure to support industrial development within the study area. As these activities have already been authorised and are not being reapplied for as part of the current application, the DWS Risk Assessment Matrix (2023) was not applied as no additional significant quantum of risk to the adjacent wetlands is deemed likely as a result of the proposed development.

In addition to the direct impacts associated with the infilling of wetlands, consideration must also be given to the potential indirect impacts on adjacent wetlands that may arise during the operation of the proposed Plant. Operational activities, particularly the combustion of natural gas and associated plant processes, will result in atmospheric emissions and particulate deposition, which may be transported and deposited within surrounding wetland areas. The deposition of particulates and associated pollutants has the potential to affect wetland water quality and alter the chemical and physical characteristics of wetland soils.

In terms of habitat and biota, the settling of dust may alter the vegetation composition particularly to the surrounding wetlands. While these impacts are expected to be localised and low in magnitude relative to the direct loss of wetlands within the development footprint, they must be managed accordingly given that they represent indirect influences the Project may have on the ecological integrity and functioning of adjacent freshwater systems which are not directly impacted by the proposed Project.

It is therefore recommended that monitoring measures be implemented, including dust monitoring, and dust suppression (where applicable) in line with relevant standards, and periodic (three yearly) monitoring of adjacent wetland condition to ensure that indirect impacts remain low. should any changes in wetland structure and function be observed that are attributable to the Project, appropriate adaptive management should be initiated.

13.14.2 Mitigation Measures

- Development footprint:
  - All development footprint areas must be minimised as far as practicable, with disturbance limited strictly to the authorised wetland infilling areas and associated infrastructure footprint.
  - The boundaries of all footprint areas, including construction and laydown areas, must be clearly demarcated prior to construction, and all activities must remain within these defined areas to prevent unnecessary disturbance to adjacent, non-impacted portions of the wetland and surrounding environment. Edge effects must be carefully managed and contained.
  - Appropriate sanitary facilities must be provided for the duration of the construction phase, with all waste collected and disposed of at a licensed waste disposal facility.

- All hazardous substances and stockpiles must be stored on bunded surfaces, with adequate measures implemented to contain and control runoff from these areas.
- All hazardous storage containers and storage areas must comply with relevant SANS standards to prevent leaks and spills.
- No open fires shall be permitted within or in close proximity to the construction area.
- Sufficient waste receptacles and spill kits must be provided on-site to ensure effective waste management and rapid response to accidental spills.

❑ Vehicle access:

- All vehicles must be regularly inspected for leaks. Re-fuelling must take place on a sealed surface area to prevent ingress of hydrocarbons into the topsoil.
- In the event of a vehicle breakdown, maintenance of vehicles must take place with care and the recollection of spillage should be practiced near the surface area to prevent ingress of hydrocarbons into topsoil and subsequent habitat loss.
- All spills should they occur, should be immediately cleaned up and treated accordingly.

❑ Vegetation:

- The proliferation of alien and invasive plant species is anticipated within disturbed areas associated with the proposed development. Although current levels of invasion are not considered severe, the vegetation within the freshwater ecosystem is already transformed, creating conditions conducive to further invasion. Alien invasive species are highly opportunistic and are likely to establish and spread in response to disturbance; therefore, these species must be actively controlled and eradicated to prevent their spread beyond the authorised project footprint. In addition, the potential for seed dispersal from the upper soil layers within disturbed footprint areas must be managed, as this may negatively affect future rehabilitation success.
- The removal and control of alien and weed species must be undertaken in compliance with applicable legislation, including the Conservation of Agricultural Resources Act (Act No. 43 of 1983), and the duty of care provisions outlined in Section 28 of NEMA.
- Eradication efforts must be implemented in a manner that minimises additional disturbance, with footprint areas kept as small as practicable during clearing activities. Access by vehicles within designated sensitive freshwater ecosystem areas must be strictly prohibited during alien and weed eradication to prevent further degradation and the spread of invasive species.

❑ Soils:

- The establishment and maintenance of indigenous vegetation within and adjacent to disturbed areas should be promoted as far as practicable, in order to stabilise soils, reduce erosion, and minimise runoff and sediment transport into adjacent freshwater systems.
- Regular monitoring of the development footprint must be undertaken to assess the extent of soil disturbance and sedimentation, enabling the implementation of appropriate adaptive management measures where required.

13.15 Terrestrial Biodiversity

The outcomes of the Terrestrial Biodiversity Assessment (STS, 2026a) (contained in **Appendix E4**), Floral Assessment (STS, 2026b) (contained in **Appendix E5**), and Faunal Assessment (STS, 2026c) (contained in **Appendix E6**) are presented below.

13.15.1 Impact Description

13.15.1.1 Floral Assessment

While the site is located within a largely transformed industrial landscape, the potential presence of remnant vegetation, secondary grassland, and modified wetland features introduces ecological sensitivities that require consideration.

Impacts on Floral Diversity and Habitat Integrity

The proposed development will result in the complete transformation of all vegetation within the study area, including terrestrial and freshwater-associated habitats. As such, the loss of floral habitat and associated biodiversity is considered unavoidable within the proposed development footprint.

The pre-construction phase does not result in direct impacts to floral habitat or species; however, it plays an important role in ensuring that regulatory compliance, species identification, permitting, and planning are appropriately undertaken prior to site clearance. With the implementation of the recommended mitigation measures, pre-construction impacts are anticipated to remain low and acceptable.

The construction phase represents the primary source of direct botanical impact. Activities associated with site clearing, earthworks, and infrastructure development will result in the permanent loss of all vegetation within the footprint, including all remaining terrestrial vegetation units. This will result in a complete loss of local plant species diversity within the site, including common species and any SCC (protected or potentially threatened) that may be present but were not detected during surveys.In addition to direct habitat loss, construction activities may result in indirect impacts to adjacent areas (where present), including edge effects such as dust deposition, erosion, soil compaction, and the spread of AIPs. These impacts are, however, considered localised and manageable through the implementation of appropriate mitigation measures.

The operational phase is characterised by indirect and management-driven impacts rather than direct habitat loss. Potential impacts are limited to edge effects, AIP spread and altered stormwater dynamics affecting adjacent or downstream environments. With appropriate management, these impacts are expected to remain of low significance.

Overall, provided that strict mitigation measures and good environmental practices are implemented, impacts on floral diversity and habitat integrity are considered to be acceptable at a

broader ecological scale, notwithstanding the complete loss of habitat within the development footprint.

Impacts on Floral SCC (threatened and protected)

The proposed development will result in the complete transformation of all habitats within the study area, and therefore the potential loss of individuals of threatened and protected plant species cannot be excluded.

Although no threatened plant species were confirmed during the site assessment, the survey was not conducted during the optimal flowering season, which may have limited detectability. Furthermore, the presence of suitable habitat, particularly within the applicable habitats, indicates a reasonable likelihood of occurrence for certain SCCs. As such, a precautionary approach has been adopted.

Pre-construction walkdowns during the appropriate season are therefore required to verify the presence of SCC prior to site clearance. Where individuals are identified, search, rescue, and relocation measures must be implemented in accordance with applicable permit conditions. Where relocation is not feasible, destruction permits may be required.

Several protected plant species may occur within the study area, including species protected under provincial and national legislation. Given the full extent of transformation, impacts to these species are considered largely unavoidable. However, these species are not necessarily threatened, and impacts are not expected to affect their broader conservation status, provided that all permitting and mitigation requirements are adhered to.

Post-mitigation, impacts on SCC are expected to be reduced to low significance through appropriate identification, permitting, and rescue actions. However, it is acknowledged that residual losses may still occur where species are not detected or where relocation success is limited.

Impact on CBAs, ESAs, Threatened Vegetation and Protected Areas

From a desktop assessment, portions of the study area are mapped as falling within a CBA, primarily associated with freshwater features and broader conservation planning priorities within the Maputaland Wooded Grassland ecosystem, which is listed as Endangered. However, field verification indicates that the terrestrial vegetation within the study area exhibits only limited affinity to the reference condition of this ecosystem, with much of the site being degraded and subject to historical and ongoing disturbance.

Importantly, no CBA habitat has been confirmed within the terrestrial components of the study area, as the mapped CBA features are associated with freshwater habitats, which are excluded from the current assessment due to existing authorisation for their infilling. As such, the terrestrial habitats within the study area are not considered to represent functional CBA or ESA habitat.

The proposed development will result in the complete transformation of terrestrial habitat units within the development footprint, including areas that retain limited characteristics of the Endangered Maputaland Wooded Grassland. However, given the disturbed nature of the site, the relatively low ecological condition of much of the vegetation, and the limited representation of intact reference habitat, the ecological importance of the affected area is considered to be reduced.

The surrounding landscape is already characterised by transformation, fragmentation, and reduced ecological connectivity. In this context, the loss of terrestrial habitat within the study area is not expected to result in meaningful disruption of ecological processes, connectivity, or functionality at a landscape scale.

Accordingly, impacts to CBAs, ESAs, and threatened vegetation are considered to be localised in extent, with significance driven primarily by the presence of degraded habitat with limited affinity to an Endangered ecosystem, rather than the loss of intact or high-quality conservation features.

Probable Residual Impacts

No significant negative residual impacts on terrestrial biodiversity have been identified for the proposed Project. However, even with extensive mitigation, residual impacts on the receiving floral ecological environment are possible. The following points highlight the key residual impacts that have been identified:

- Permanent loss of and altered floral species diversity associated with the limited representative habitat of Endangered RLE Ecosystem;
- Loss of potential individuals of threatened and protected plant species that may not be detected or successfully relocated;
- Localised edge effects, including AIP proliferation and disturbance along development boundaries.

13.15.1.2 Faunal Assessment

Impacts on Faunal Habitat and Diversity

The proposed development activities will result in the extensive clearance of vegetation, which will lead to a loss of faunal habitat, important supporting habitat, and diversity within the study area. Impacts associated with the faunal communities is not anticipated to be high provided that mitigation measures are undertaken. The proposed development activities within the Thicket habitat will result in the loss of forage and sheltering areas for several fauna. Although this unit is encroached and degraded in nature it does provide habitat of valuable structure for invertebrates, reptiles and avifauna. The loss of this unit is however not anticipated to lead to highly significant impacts on faunal diversity at a regional level. The Transformed habitat is already considered developed and thus impacts are anticipated to be low.

Negative impacts likely to be associated with the faunal ecology within study area includes increased urbanisation and industrialisation and placement of infrastructure within natural habitat. There is also likely going to be a reduction in faunal movement corridors in the general area. AIP

proliferation, bush encroachment, and erosion in disturbed areas have a high potential to degrade the remaining faunal habitat. Increased human movement, will likely lead to greater pressure on faunal communities and increasing the potential for human wildlife conflict.

Vegetation clearing and habitat transformation (i.e., direct impacts) to 1) faunal habitat and species diversity and 2) SCC will both be greatest during the operation phase in the Degraded Hygrophilous Grassland. Post-mitigation, impacts will likely result in a Medium-Low and Low impact respectively. Significance on faunal ecology and can be largely restricted to the footprint areas in the construction and operation phase.

Impacts on Faunal SCC

No faunal SCC identified by the Screening Tool or IUCN were confirmed on site. Nevertheless, the study area contains habitat that may be suitable for certain faunal SCC known to occur in the surrounding landscape. The potential occurrence and use of the site by these species are, however, likely to be constrained by habitat fragmentation and existing anthropogenic disturbances.

Three (3) other SCC have a high POC for the study area; *Hemisus guttatus* (Spotted Snout-Burrower, Near Threatened), *Hemicordulia Africana* (African Emerald, Vulnerable) and *Agriocnemis gratiosa* (Gracious Wisp, Near Threatened), whilst four (4) other faunal SCCs have a medium POC - which may potentially be encountered within the study area. It is noted that these species are not likely dependent on the study area for survival, and the area may only be a part of their larger home ranges or foraging areas. If all mitigation measures are adhered to, the potential impacts on faunal SCC are expected to be limited and not detrimental to the SCC on a local to regional scale.

Probable Residual Impacts

Even with extensive mitigation, residual impacts on the receiving faunal ecological environment will still persist. The following points highlight the key residual impacts that have been identified:

- Altered faunal species diversity and abundance in and immediately adjacent the development footprint areas;
- Edge effects such as further habitat fragmentation and AIP proliferation;
- Potential loss of faunal SCC including suitable habitat for such species;
- Disturbed areas not rehabilitated to an ecologically functioning state with resulting significant loss of faunal habitat, species diversity, and SCC likely to be permanent; and
- Edge effects such as further habitat fragmentation and AIP proliferation.

13.15.2 Impact Assessment

13.15.2.1 Floral Assessment

The assessment of impacts to floral habitat, diversity, and significant biodiversity features during the pre-construction, construction and operational phases are presented in Table 65, Table 66 and Table 67 below, respectively.

Table 65: Pre-construction phase impacts on the floral habitat, diversity, and significant biodiversity features (STS, 2026b)

	Probability	Sensitivity	Severity	Spatial Scale	Duration	Likelihood	Consequence	Significance	Probability	Sensitivity	Severity	Spatial Scale	Duration	Likelihood	Consequence	Significance
Inadequate pre-construction planning may result in non-compliance with environmental legislation, particularly regarding the identification, permitting, and management of protected flora and species of conservation concern prior to site clearance.	3	3	3	2	4	6	9	54 Medium-low	2	3	2	2	4	5	8	40 Low

Table 66: Construction phase impacts on the floral habitat, diversity, and significant biodiversity features (STS, 2026b)

Affected Environment	Probability	Sensitivity	Severity	Spatial Scale	Duration	Likelihood	Consequence	Significance	Probability	Sensitivity	Severity	Spatial Scale	Duration	Likelihood	Consequence	Significance
IMPACT 1: Loss and degradation of terrestrial and freshwater vegetation communities within and adjacent to the development footprint																
Transformed Habitat (approx. 0.4 ha)	5	1	1	2	5	6	8	48 Low	5	1	1	1	5	6	7	42 Low
Hygrophilous Grasslands (9.6 ha)	5	2	3	2	5	7	10	70 Medium-low	5	2	2	1	5	7	9	56 Medium-low
Thicket Habitat (1.1 ha)	5	3	3	2	5	8	10	80 Medium-high	5	3	3	1	5	8	9	72 Medium-low
IMPACT 2: Loss or degradation of threatened species and their habitat																
Transformed Habitat (approx. 0.4 ha)	1	1	1	2	5	2	8	16 Very low	1	1	1	1	5	2	7	14 Very low
Hygrophilous Grasslands (9.6 ha)	2	2	2	2	5	4	9	36 Low	1	2	1	1	5	3	7	21 Very low
Thicket Habitat (1.1 ha)	4	3	3	2	5	7	9	63 Medium-low	3	3	1	1	5	6	7	42 Low
IMPACT 3: Habitat fragmentation and edge effects resulting from vegetation clearing and infrastructure development.																
Remaining/ adjacent natural habitat	4	3	3	3	4	7	10	70 Medium-low	3	3	2	2	4	6	8	48 Medium-low
Ecological corridors	2	2	2	3	4	4	9	36 Low	1	2	2	2	4	2	8	24 Very low

Table 67: Operational phase impacts on the floral habitat, diversity, and significant biodiversity features (STS, 2026b)

Affected Environment	Probability	Sensitivity	Severity	Spatial Scale	Duration	Likelihood	Consequence	Significance	Probability	Sensitivity	Severity	Spatial Scale	Duration	Likelihood	Consequence	Significance
Ongoing operational activities may result in indirect impacts to adjacent natural habitats (if present), including edge effects such as human disturbance, dust, noise, and altered microclimatic conditions along the development boundary.	3	3	2	2	4	6	8	48 Low	2	4	2	1	4	5	6	30 Low
Operational activities and disturbed conditions may facilitate the establishment and spread of AIPs into adjacent natural habitats.	4	3	2	2	4	7	8	56 Medium-low	2	4	2	2	4	6	6	36 Low
Altered stormwater runoff from increased impermeable surfaces may result in localised erosion, sedimentation, or hydrological changes in adjacent areas or downstream environments.	4	3	2	2	4	7	8	56 Medium-low	2	4	1	2	4	6	6	36 Low

13.15.2.2 Faunal Assessment

The assessment of impacts to faunal habitat, diversity, and SCC during the pre-construction, construction and operational phases are presented in Table 68, Table 69 and Table 70 below, respectively.

Table 68: Pre-construction phase impacts on faunal habitat, diversity, and SCC (STS, 2026c)

Habitat Units	UNMANAGED								MANAGED							
	Probability of Impact	Sensitivity	Severity	Spatial Scale	Duration of Impact	Likelihood	Consequence	Significance	Probability of Impact	Sensitivity	Severity	Spatial Scale	Duration of Impact	Likelihood	Consequence	Significance
Faunal Habitat and Diversity																
Degraded Hygrophilous Grassland	3	3	3	2	2	6	7	42 Low	2	3	2	1	2	5	5	25 Very Low
Thicket Habitat	3	3	3	2	2	6	7	42 Low	2	3	2	1	2	5	5	25 Very Low
Transformed Habitat	3	1	1	1	2	4	4	16 Very Low	2	1	1	1	2	3	4	12 Very Low
Faunal SCC																
Degraded Hygrophilous Grassland	3	3	3	2	2	6	7	42 Low	2	3	2	1	2	5	5	25 Very Low
Thicket Habitat	3	3	3	2	2	6	7	42 Low	2	3	2	1	2	5	5	25 Very Low
Transformed Habitat	1	1	1	1	2	2	4	8 Very Low	1	1	1	1	2	2	4	8 Very Low

Table 69: Construction phase impacts on faunal habitat, diversity, and SCC (STS, 2026c)

Habitat Units	UNMANAGED								MANAGED							
	Probability of Impact	Sensitivity	Severity	Spatial Scale	Duration of Impact	Likelihood	Consequence	Significance	Probability of Impact	Sensitivity	Severity	Spatial Scale	Duration of Impact	Likelihood	Consequence	Significance
Faunal Habitat and Diversity																
Degraded Hygrophilous Grassland	5	3	3	2	3	8	8	64 Medium-Low	5	3	2	2	3	8	7	56 Medium-Low
Thicket Habitat	5	3	3	2	3	8	8	64 Medium-Low	5	3	2	2	3	8	7	56 Medium-Low
Transformed Habitat	4	1	1	1	3	5	5	25 Very Low	4	1	1	1	3	5	5	25 Very-Low
Faunal SCC																
Degraded Hygrophilous Grassland	4	3	3	2	3	7	8	56 Medium-Low	3	3	2	2	3	6	7	42 Low
Thicket Habitat	4	3	3	2	3	7	8	56 Medium-Low	3	3	2	2	3	6	7	42 Low
Transformed Habitat	1	1	1	1	3	2	5	10 Very Low	1	1	1	1	3	2	5	10 Very-Low

Table 70: Operational phase impacts on faunal habitat, diversity, and SCC (STS, 2026c)

Habitat Units	UNMANAGED								MANAGED							
	Probability of Impact	Sensitivity	Severity	Spatial Scale	Duration of Impact	Likelihood	Consequence	Significance	Probability of Impact	Sensitivity	Severity	Spatial Scale	Duration of Impact	Likelihood	Consequence	Significance
Faunal Habitat and Diversity																
Degraded Hygrophilous Grassland	4	3	3	2	5	7	10	70 Medium-Low	4	3	2	1	5	7	8	56 Medium-Low
Thicket Habitat	4	3	2	2	5	7	9	63 Medium-Low	4	3	1	1	5	7	7	49 Low
Transformed Habitat	3	1	1	1	5	4	7	28 Low	3	1	1	1	5	4	7	28 Low
Faunal SCC																
Degraded Hygrophilous Grassland	4	3	2	2	5	7	9	63 Medium-Low	3	3	1	1	5	6	7	42 Low
Thicket Habitat	4	3	2	2	5	7	8	56 Medium-Low	4	3	1	1	5	7	7	49 Low
Transformed Habitat	1	1	1	1	5	2	7	10 Very Low	1	1	1	1	5	2	7	10 Very Low

13.15.3 Mitigation Measures

13.15.3.1 Floral Assessment

Pre-Construction Phase

- ❑ Site Planning, Environmental Control and Compliance
  - Clearly demarcate the approved development footprint, construction camps, laydown areas, stockpile areas, access routes and any environmentally sensitive areas prior to site establishment. All project-related activities must be confined to the approved development footprint.
  - Establish controlled access points and prevent uncontrolled access or disturbance outside authorised areas.
  - Appoint a suitably qualified ECO or environmental professional to oversee implementation of mitigation measures and compliance monitoring throughout construction.
  - Ensure that all permit conditions, ecological constraints and environmental management requirements are communicated to contractors prior to construction through site inductions and toolbox talks.
  - Contractors must prepare method statements for vegetation clearing, site establishment, earthworks, material storage and topsoil handling for ECO approval prior to implementation.
  - Establish and maintain a permit and compliance register and undertake regular environmental audits and reporting.
- ❑ Species Verification, Permitting and Rescue
  - Undertake a pre-construction ecological walkdown during the appropriate season (November to May, where practicable) to confirm the presence of threatened and protected plant species within the development footprint.
  - Obtain all permits required under applicable provincial and national legislation prior to site clearance.
  - Implement search, rescue and relocation measures for protected and threatened plant species where required by permit conditions.
  - Identify suitable recipient sites for relocated individuals, either on-site (where feasible) or off-site.
  - Rescue and relocation activities must be undertaken by suitably qualified specialists and conducted in accordance with permit requirements.
  - Obtain formal sign-off from the botanical specialist and ECO prior to vegetation clearing.
- ❑ Ecological Infrastructure Planning
  - Design stormwater infrastructure in consultation with relevant specialists to prevent adverse impacts on adjacent natural areas, wetlands and drainage features.
  - Stormwater infrastructure must minimise erosion, sedimentation, concentrated flows and alterations to hydrological processes.

- Prepare site-specific erosion-control, rehabilitation and AIP management plans prior to construction.

❑ Topsoil Management

- Implement a Topsoil Management Plan that provides for the stripping, stockpiling, protection and reuse of topsoil to conserve seed banks and facilitate rehabilitation.

Construction Phase

❑ Vegetation Clearing and Habitat Protection

- Restrict vegetation clearing, construction activities, vehicle movement, stockpiling and material storage to designated areas within the approved development footprint.
- Clearly maintain all demarcation boundaries throughout construction and prevent unauthorised encroachment into adjacent areas.
- Prevent the creation of informal access roads, tracks or disturbance corridors into surrounding areas.
- Human access to adjacent natural areas must be controlled and the collection, damage or removal of indigenous flora prohibited.

❑ SCC and Protected Plant Species

- Implement phased vegetation clearing where practicable, with targeted ecological inspections immediately ahead of clearing activities.
- Obtain all required permits before clearing any protected or threatened flora.
- Implement search, rescue and relocation measures for protected and threatened plant species where applicable.
- All rescue, relocation and monitoring activities must be undertaken under the supervision of a suitably qualified botanical specialist.
- The ECO must verify implementation of permit conditions prior to and during site clearing.
- Relocated individuals must be monitored where required by permit conditions.

❑ Erosion, Stormwater and Rehabilitation

- Implement stormwater, erosion-control and sediment-control measures to prevent erosion, sedimentation, concentrated runoff and the formation of preferential flow paths.
- Disturbed areas, stockpiles and exposed soils must be stabilised and rehabilitated as soon as practicably possible.
- Stockpiled material must be placed in designated areas and managed to prevent erosion and colonisation by AIPs.
- Implement a Rehabilitation Plan for any disturbance occurring outside the approved footprint.

❑ AIP Management

- Implement active AIP monitoring and control throughout construction.
- Construction vehicles and equipment must be cleaned where necessary to prevent the introduction and spread of invasive plant propagules.

- Monitor disturbed areas and development edges for invasive species establishment and undertake prompt control.

❑ Pollution and Edge Effect Management

- Implement measures to minimise dust generation and deposition on adjacent vegetation.
- Spill kits must be available on site and all hydrocarbon, chemical or cement spills must be contained and remediated immediately.
- Construction rubble, vegetation waste, garden waste and surplus material must be removed to authorised disposal facilities and not dumped in natural areas.
- No uncontrolled or unauthorised fires may be permitted.
- Development edges must be inspected regularly to identify erosion, invasive species establishment and vegetation degradation.

Operational Phase

❑ Habitat and Boundary Management

- Clearly maintain operational boundaries and prevent gradual encroachment into adjacent natural areas.
- Access to adjacent natural areas must be controlled and informal pathways discouraged.
- No dumping of litter, waste, landscaping material or maintenance-related waste may occur within adjacent natural areas.
- Operational activities must be undertaken in a manner that avoids degradation of adjacent vegetation.
- Fire risks associated with operational activities must be appropriately managed.

❑ AIP Management and Landscaping

- Implement and maintain the AIP Management Plan throughout the operational phase.
- Use indigenous species in landscaping and prohibit the use of invasive species.
- Monitor landscaped, rehabilitated, disturbed and stormwater management areas for invasive species establishment and undertake follow-up control.
- Implement hygiene measures where necessary to prevent the spread of invasive species during maintenance activities.

❑ Stormwater and Edge Effects

- Maintain stormwater infrastructure to prevent erosion, sedimentation, waterlogging, concentrated flows and adverse changes to adjacent habitats.
- Incorporate and maintain appropriate energy-dissipation measures at discharge points.
- Inspect stormwater infrastructure and discharge points regularly, particularly following significant rainfall events, and implement corrective actions where degradation is identified.
- Manage edge effects including erosion, dust, soil compaction, vegetation disturbance, invasive species proliferation and unnecessary light spill along development boundaries.
- Stormwater management must remain aligned with recommendations contained in the Freshwater Ecological Assessment.

13.15.3.2 Faunal Assessment

Pre-Construction Phase

- ❑ Restrict all infrastructure and associated disturbance to the authorised development footprint.
- ❑ Clearly demarcate all areas to be disturbed prior to construction.
- ❑ Minimise vegetation loss through careful site planning and footprint optimisation.
- ❑ Utilise existing roads wherever practicable and minimise the need for new access routes.
- ❑ Implement rehabilitation planning and bush encroachment control measures as required.

Construction Phase

- ❑ Restrict vehicle movement to designated access routes and limit additional road construction.
- ❑ Undertake phased vegetation clearing to allow fauna to disperse from the site.
- ❑ Relocate reptiles, amphibians and other fauna encountered within the footprint where safe and appropriate. No faunal species may be intentionally harmed or killed.
- ❑ If SCC are encountered, cease work within the immediate area and consult a suitably qualified specialist. Notify relevant authorities where required.
- ❑ Manage edge effects to adjacent habitats and prevent unnecessary disturbance beyond the authorised footprint.
- ❑ Dispose of all rubble and cleared invasive plant material at authorised disposal facilities.
- ❑ Rip, profile and re-establish indigenous vegetation in compacted areas disturbed outside the approved footprint.
- ❑ Prohibit hunting, trapping, persecution of fauna and informal fires.
- ❑ Implement spill response measures, maintain spill kits on site and prevent soil contamination.
- ❑ Undertake vegetation clearing during winter months where practicable to minimise impacts on breeding fauna.
- ❑ Implement stormwater management measures that prevent the creation of artificial flow paths and habitat degradation.
- ❑ Design external lighting to minimise impacts on fauna.

Operational Phase

- ❑ Manage erosion, invasive species and other edge effects affecting adjacent habitats.
- ❑ Rehabilitate exposed areas and monitor rehabilitation success until ecological functioning is restored.
- ❑ Prohibit hunting, trapping and persecution of fauna.
- ❑ Educate staff regarding biodiversity sensitivities and appropriate interactions with wildlife.
- ❑ Ensure reptiles, arachnids and other fauna encountered during operations are relocated safely by suitably trained personnel where necessary.
- ❑ Prevent littering and waste accumulation within the facility and adjacent habitats.

13.16 Visual Quality

The outcomes of the Visual Resource Compliance Statement (SAS, 2025) are presented below. The specialist report is contained in **Appendix E9**.

Potential risks to the receiving environment that may occur as a result of the proposed industrial development include:

- The sense of place of the study area directly will be affected, however the larger region's sense of place will not be adversely affected, because of the bulk existing industrial activities present in the landscape.
- The proposed Project is most likely to increase the bulk appearance of industrial structures in the landscape, therefore visual exposure and visibility may be impacted, which relates directly to the perception of sensitive visual receptors towards the Project. Sensitive visual receptors have been determined to primarily comprise residents and road users, however due to the distance the receptors are considered to have a low sensitivity. Direct visual exposure will take place as a result of industrial infrastructure being present, as well as indirectly through fugitive dust generated by construction and operation related activities, such as construction vehicles driving on dirt roads, as well as earthwork activities and blasting.
- Lighting associated with the proposed Project may be visible during both day and night but is more likely to have an adverse visual impact during the night time. Since the study area is situated within high district brightness area, there various light sources contributing to sky glow, thus the proposed industrial activities are likely to contribute to sky glow and further reduce night sky quality. It is important to note that should the proposed facility make use of a stack flame, the indirect lighting visual impact may be of increased significance.

Based on the outcome of the assessment the proposed Project will most likely have a low visual impact on the receiving environment, due to the dense wooded grassland vegetation, plantations, existing industrial structures and undulating terrain partially obscuring and/ or completely screening the view from the visual receptors present within a 3 km radius.

13.17 Noise

The outcomes of the Noise Impact Assessment (Enviro-Acoustic Research, 2026) are presented below. The specialist report is contained in **Appendix E8**.

13.17.1 Impact Assessment

Construction Phase

The potential significance of noise impacts associated with the construction phase is summarised in Table 71 for daytime construction activities and Table 72 for the potential night-time construction scenario.

Table 71: Noise impact assessment: potential day-time construction activities (Enviro-Acoustic Research, 2026)

Nature of Impact: Precautious approach, with daytime ambient sound level measurements indicating noise levels typical of a suburban noise district, though it should be noted that measurements were collected further than 150m from the R619 road. Ambient sound levels closer to the R619 will be higher. Considering the developmental character, a rating level typical of a busy urban (main roads, business premises or workshops) noise district will be assumed (rating level of 60dBA).			
Impact description: Increase in ambient sound levels in the noise-sensitive residential areas north-east of, and the residential hostels to the south-east of the project site.			
Prior to Mitigation			
	Rating	Motivation	Significance
Magnitude	Minor (2)	Construction noises will not change the ambient sound levels during the day.	**Low (6)**
Duration	Short-term (2)	The noise impact relating to construction phase will last 1 – 2 years.	
Extent ($\Delta L_{Aeq,D}$>7dBA)	Local (2)	The noise impact would extent from the site, potentially as far as 1,000m.	
Probability	Improbable (1)	It is improbable that the higher noise level and change in ambient sound levels will impact on the closest Noise-Sensitive Receptors.	
Mitigation / Management Measures			
Mitigation: Significance of the construction noise impact is **low** for the scenario as conceptualised and additional mitigation measures are not required for daytime construction activities.			
Post Mitigation			
	Rating	Motivation	Significance
Magnitude	Minor (2)	Construction noises will not change the ambient sound levels during the day.	**Low (6)**
Duration	Short-term (2)	The noise impact relating to construction phase will last 1 – 2 years.	
Extent ($\Delta L_{Aeq,D}$>7dBA)	Local (2)	The noise impact would extent from the site, potentially as far as 1,000m.	
Probability	Improbable (1)	It is improbable that the higher noise level and change in ambient sound levels will impact on the closest Noise-Sensitive Receptors.	
Cumulative impacts: Potential of cumulative noise impact is low.			
Residual Risks: The significance of the noise impact for daytime construction activities is projected to be low.			

Table 72: Noise impact assessment: potential night-time construction activities (Enviro-Acoustic Research, 2026)

Nature of Impact: Precautious approach, with night-time ambient sound level measurements indicating noise levels typical of an urban noise district, though it should be noted that measurements were collected further than 150m from the R619 road. Ambient sound levels closer to the R619 will be higher. Considering the developmental character, a rating level typical of a busy urban (main roads, business premises or workshops) noise district will be assumed (rating level of 50dBA).			
Impact description: Increase in ambient sound levels in the noise-sensitive residential areas north-east of, and the residential hostels to the south-east of the project site.			
Prior to Mitigation			
	Rating	Motivation	Significance
Magnitude	Minor (2)	Construction noises will not change night-time ambient sound levels.	**Low (6)**
Duration	Short-term (2)	The noise impact relating to construction phase will last 1 – 5 years.	
Extent ($\Delta L_{Aeq,D}$>7dBA)	Local (2)	The noise impact would extent from the site, potentially as far as 1,000m.	

Probability	Improbable (1)	It is improbable that the higher noise level and change in ambient sound levels will impact on the closest Noise-Sensitive Receptors.	
Mitigation / Management Measures			
Mitigation: Significance of the construction noise impact is **low** for the scenario as conceptualized and additional mitigation measures are not required.			
Post Mitigation			
	Rating	Motivation	Significance
Magnitude	Minor (2)	Construction noises will not change night-time ambient sound levels.	**Low (6)**
Duration	Short-term (2)	The noise impact relating to construction phase will last 1 – 5 years.	
Extent ($\Delta L_{Aeq,D}$>7dBA)	Local (2)	The noise impact would extent from the site, potentially as far as 1,000m.	
Probability	Improbable (1)	It is improbable that the higher noise level and change in ambient sound levels will impact on the closest Noise-Sensitive Receptors.	
Cumulative impacts: Potential of cumulative noise impact is low.			
Residual Risks: The significance of the noise impact for night-time construction activities is projected to be low.			

Operational Phase

The potential significance of noise impacts associated with the operational phase is summarised in Table 73 for daytime operational activities and Table 74 for the night-time operational activities.

Table 73: Noise impact assessment: potential daytime operational activities (Enviro-Acoustic Research, 2026)

Nature of Impact: Precautious approach, with daytime ambient sound level measurements indicating noise levels typical of a suburban noise district, though it should be noted that measurements were collected further than 150m from the R619 road. Ambient sound levels closer to the R619 will be higher. Considering the developmental character, a rating level typical of a busy urban (main roads, business premises or workshops) noise district will be assumed (rating level of 60dBA).			
Impact description: Increase in ambient sound levels in the noise-sensitive residential areas north-east of, and the residential hostels to the south-east of the project site.			
Prior to Mitigation			
	Rating	Motivation	Significance
Magnitude	Minor (2)	Operational noises (power generation activities) will not change the ambient sound levels during the day.	**Low (8)**
Duration	Long-term (4)	The noise impact relating to the operational phase can last up to 25 years.	
Extent ($\Delta L_{Aeq,D}$>7dBA)	Local (2)	The noise impact would extent from the site, potentially as far as 1,000m.	
Probability	Improbable (1)	It is improbable that the higher noise level and change in ambient sound levels will impact on the closest Noise-Sensitive Receptors.	
Mitigation / Management Measures			
Mitigation: Significance of the construction noise impact is **low** for the scenario as conceptualized and additional mitigation measures are not required.			
Post Mitigation			
	Rating	Motivation	Significance
Magnitude	Minor (2)	Operational noises (power generation activities) will not change the ambient sound levels during the day.	**Low (8)**
Duration	Long-term (4)	The noise impact relating to the operational phase can last up to 25 years.	

Extent ($\Delta L_{Aeq,D}$>7dBA)	Local (2)	The noise impact would extent from the site, potentially as far as 1,000m.	
Probability	Improbable (1)	It is improbable that the higher noise level and change in ambient sound levels will impact on the closest Noise-Sensitive Receptors.	
Cumulative impacts: Potential of cumulative noise impact is low during the daytime period.			
Residual Risks: Noise levels will reduce after the operational phase, though noise levels may still be elevated (due to the other industrial activities associated with the industrial development zone).			

Table 74: Noise impact assessment: potential night-time operational activities (Enviro-Acoustic Research, 2026)

Nature of Impact: Precautious approach, with night-time ambient sound level measurements indicating noise levels typical of an urban noise district, though it should be noted that measurements were collected further than 150m from the R619 road. Ambient sound levels closer to the R619 will be higher. Considering the developmental character, a rating level typical of a busy urban (main roads, business premises or workshops) noise district will be assumed (rating level of 50dBA).			
Impact description: Increase in ambient sound levels in the noise-sensitive residential areas north-east of, and the residential hostels to the south-east of the project site.			
Prior to Mitigation			
	Rating	Motivation	Significance
Magnitude	Moderate (6)	Operational noises (power generation activities) will result in a moderate change in night-time ambient sound levels at NSR09. The operating CCPP will be audible in the residential areas.	**Low (24)**
Duration	Long-term (4)	The noise impact relating to the operational phase can last up to 25 years.	
Extent ($\Delta L_{Aeq,D}$>7dBA)	Regional (3)	The noise impact would extent from the site, potentially as far as 1,000m.	
Probability	Possible (2)	It is possible that the higher noise level and change in ambient sound levels will impact on the closest Noise-Sensitive Receptors.	
Mitigation / Management Measures			
Mitigation: Significance of the construction noise impact is **low** for the scenario as conceptualized and additional mitigation measures are not required.			
Post Mitigation			
	Rating	Motivation	Significance
Magnitude	Moderate (6)	Operational noises (power generation activities) will result in a moderate change in night-time ambient sound levels at NSR09. The operating CCPP will be audible in the residential areas.	**Low (24)**
Duration	Long-term (4)	The noise impact relating to the operational phase can last up to 25 years.	
Extent ($\Delta L_{Aeq,D}$>7dBA)	Regional (3)	The noise impact would extent from the site, potentially as far as 1,000m.	
Probability	Possible (2)	It is possible that the higher noise level and change in ambient sound levels will impact on the closest Noise-Sensitive Receptors.	
Cumulative impacts: There is a medium potential of a cumulative noise impact when other power generation activities take place simultaneously with the 750MW CCPP project. Night-time noise levels may result in a noise impact of medium significance due to cumulative effects during the night-time period.			
Residual Risks: Noise levels will reduce after the operational phase, though noise levels may still be elevated (due to the other industrial activities associated with the industrial development zone).			

13.17.2 Mitigation Measures

It was determined that the potential noise impact would be of a low significance for future activities, both day and night, including cumulative effects. While noise levels will be high onsite, no additional mitigation measures are recommended or are required to manage the potential impact of environmental noise on the surrounding Noise-Sensitive Receptors.

It is recommended that the applicant design the power generation plant to limit the noise emission levels from equipment and related activities to be less than 85 dBA (measured at 10m).

13.18 Plant Hazards

The outcomes of the Quantitative Risk Assessment (RISCOM, 2026) are presented below. The specialist report is contained in **Appendix E13**.

13.18.1 Impact Assessment

A risk assessment was done for each processing unit by firstly selecting a scenario and then completing consequence and outflow modelling. Consequences with possible impacts beyond the site boundary were retained for risk analysis of the unit. Finally, the risk of the entire facility was determined as a combination of the risk calculated for each unit.

The results are provided in the sub-sections to follow.

13.18.1.1 Natural Gas Pipeline Installation

Natural gas is proposed as a fuel for the gas turbines to be located onsite. Natural gas will be received by the site via the pipeline located under the facility fence. The gas would then be metered and its pressure reduced prior to entry into the gas engines. A line diameter of 381 mm has been assumed and is in line with the maximum flow from the pipeline. The pipeline was assumed to be above ground, from entering the property to the turbines.

The scenarios modelled for the natural gas pipeline included:

- Failure - 381 mm pipeline with the max. flow of 120 t/d; and
- Leak - This analysis assumes the hole size is 10% of the diameter.

Fires

The maximum distance to the 1% fatality from a release of the natural gas pipeline, is shown in Figure 87 below. The maximum distance would occur with a low wind speed and could cause severe damage along the length of the pipeline. Depending on the orientation of the release, the impacts from a large release could extend into the adjacent industrial area of Alton, but would not reach residential areas.

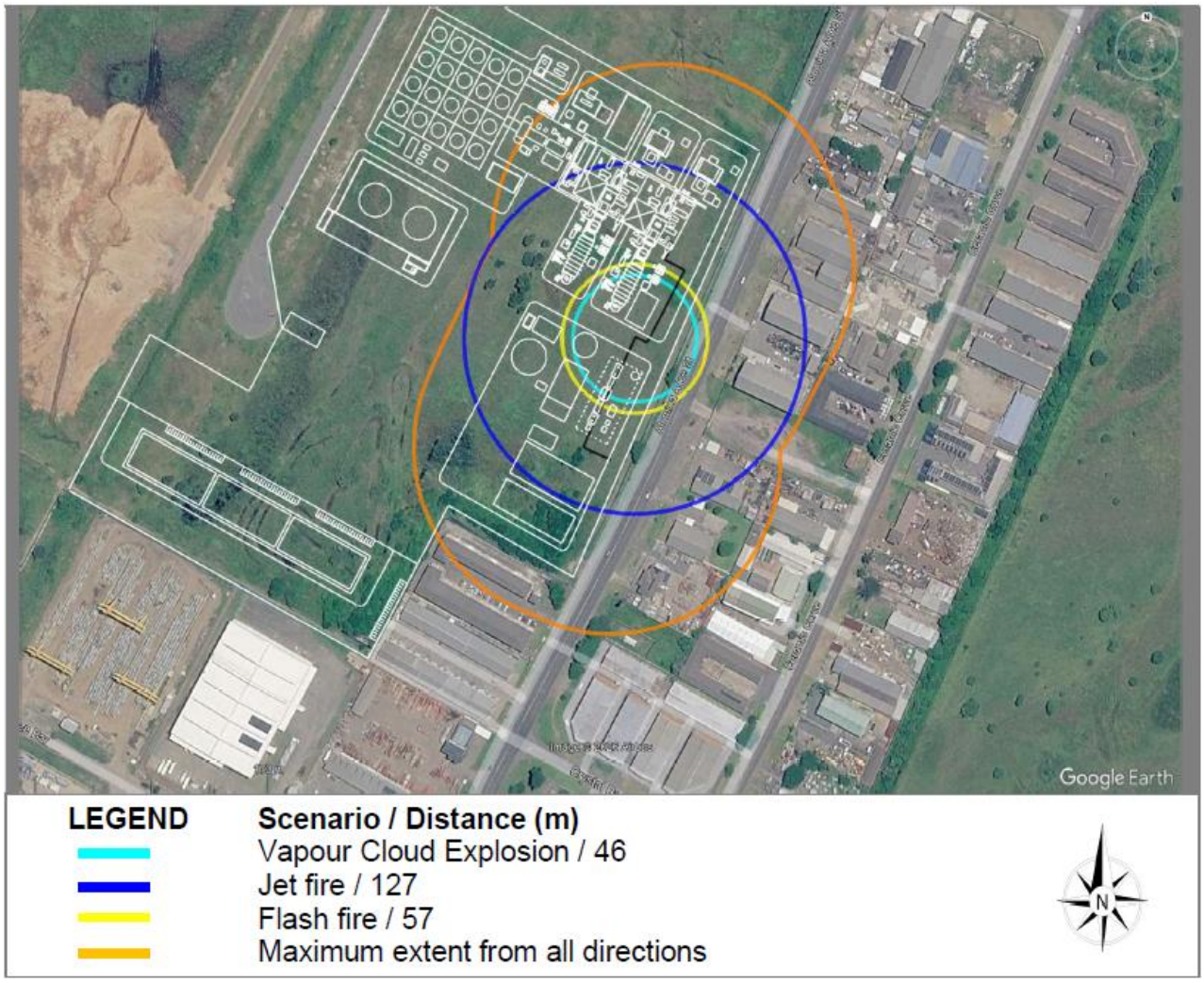

Figure 87: The maximum extent to the 1% fatality from the natural gas pipeline failure (RISCOM, 2026)

Maximum Individual Risk

The risk of $1x10^{-6}$ fatalities per person per year isopleth, due to a release of natural gas from the gas pipeline, as shown in Figure 88 below, were found to extend a short distance beyond the site boundary. The risks from fires and explosions from a natural gas release at the storage area to both the workers on site and the general offsite public, would be within the ALARP range and are considered tolerable.

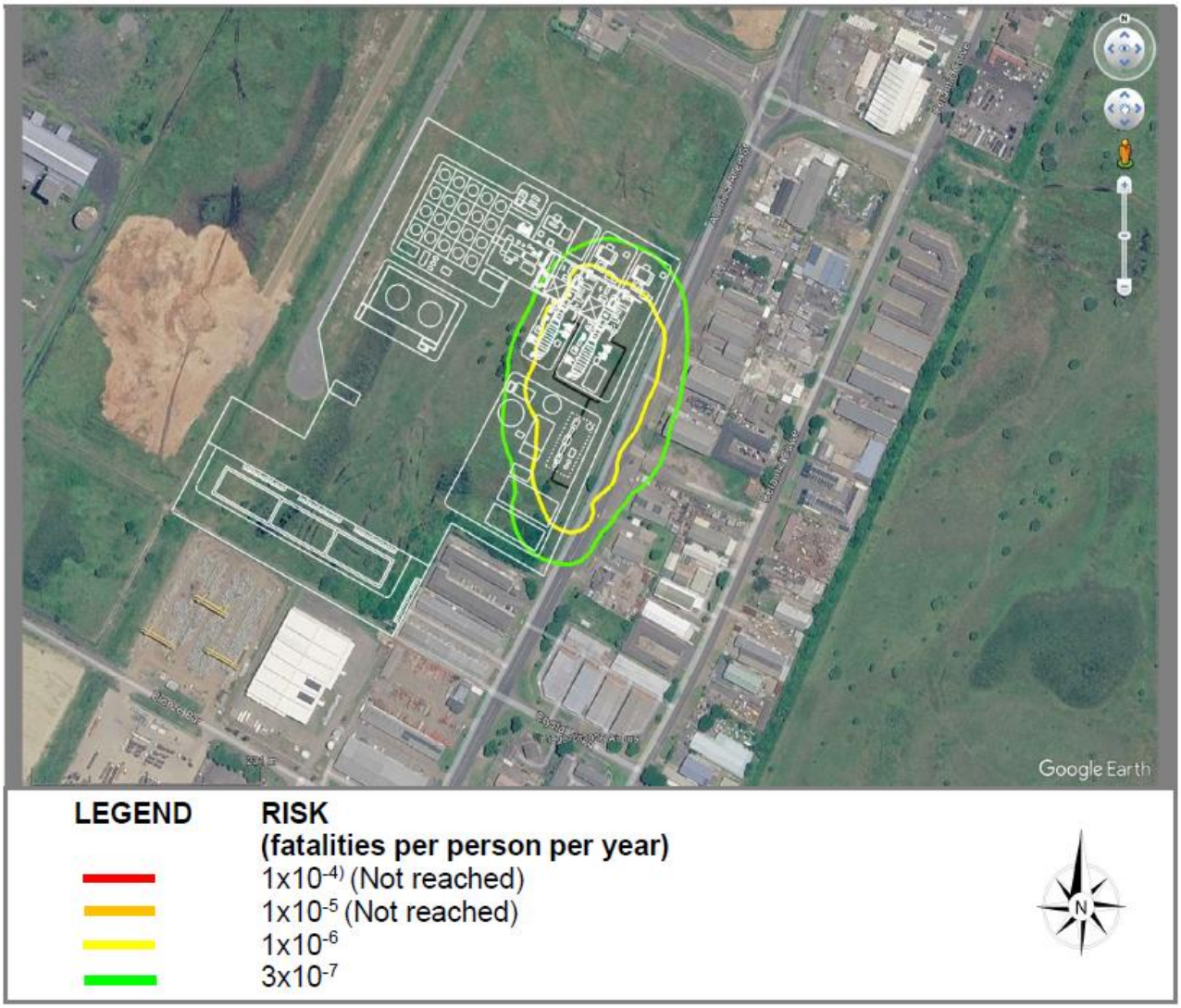

Figure 88: Lethal probability isopleths associated with the natural gas installation (RISCOM, 2026)

13.18.1.2 Diesel Installation

Diesel would be used as a back-up fuel for the gas turbines. As such, bulk storage would be required and achieved through storage in 2 x 6 500 m^3 bunded tanks.

The scenarios modelled for the diesel installation are listed in Table 75 below.

Table 75: Scenarios modelled for the Diesel installation (RISCOM, 2026)

Equipment	Scenario	Remarks
Diesel tank	Catastrophic failure	2 × 6 500 m³ tanks Bunded area of 3 450 m² Catastrophic failure release area = 1.5 m × bunded area
	Serious release into bund	Release into bund
	Overfilling	Assumes 2 × independent overfilling instruments
Diesel tanker	Tanker failure	Compartment: 5 m³ failure

Equipment	Scenario	Remarks
	Tanker nozzle failure	Release area: 75 m²
	Hose failure	Release area: 75 m²
	Hose leak	Release area: 75 m²

Fires

Diesel or light oil would be used as a backup in the event of a natural gas supply failure. In the event of a large fire, the maximum extent to the 1% fatality, is shown in Figure 89 below. The impacts from a large bund fire could extend beyond the site boundary, but not the IDZ boundary.

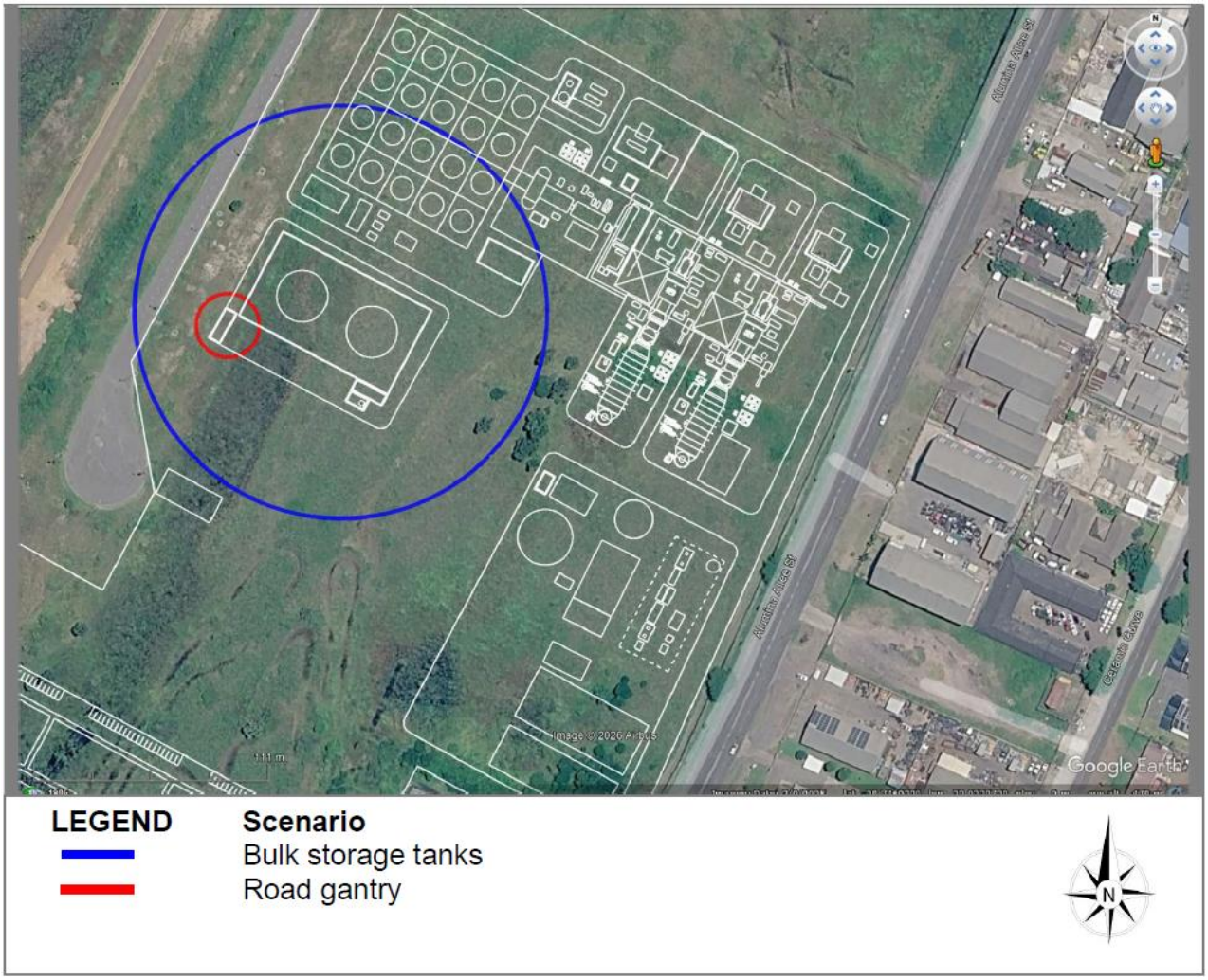

Figure 89: The maximum extent to the 1% fatality from a large LO / Diesel fire (RISCOM, 2026)

Maximum Individual Risk

The risk from the bulk storage tanks is shown in Figure 90 below. The risk of $1x10^{-6}$ fatalities per person per year isopleth will remain within the Mabasa PP site boundary.

Risks greater than $1x10^{-4}$ fatalities per person per year, considered tolerable for industrial areas but excessive for residential areas, was not reached.

The risk of $3x10^{-7}$ fatalities per person per year isopleth indicates the extent for land-use that would be suitable for vulnerable populations, such as hospitals, retirement homes, nursery schools, prisons, large gatherings in the open, and so forth. This was found to remain within the Mabasa PP site boundary.

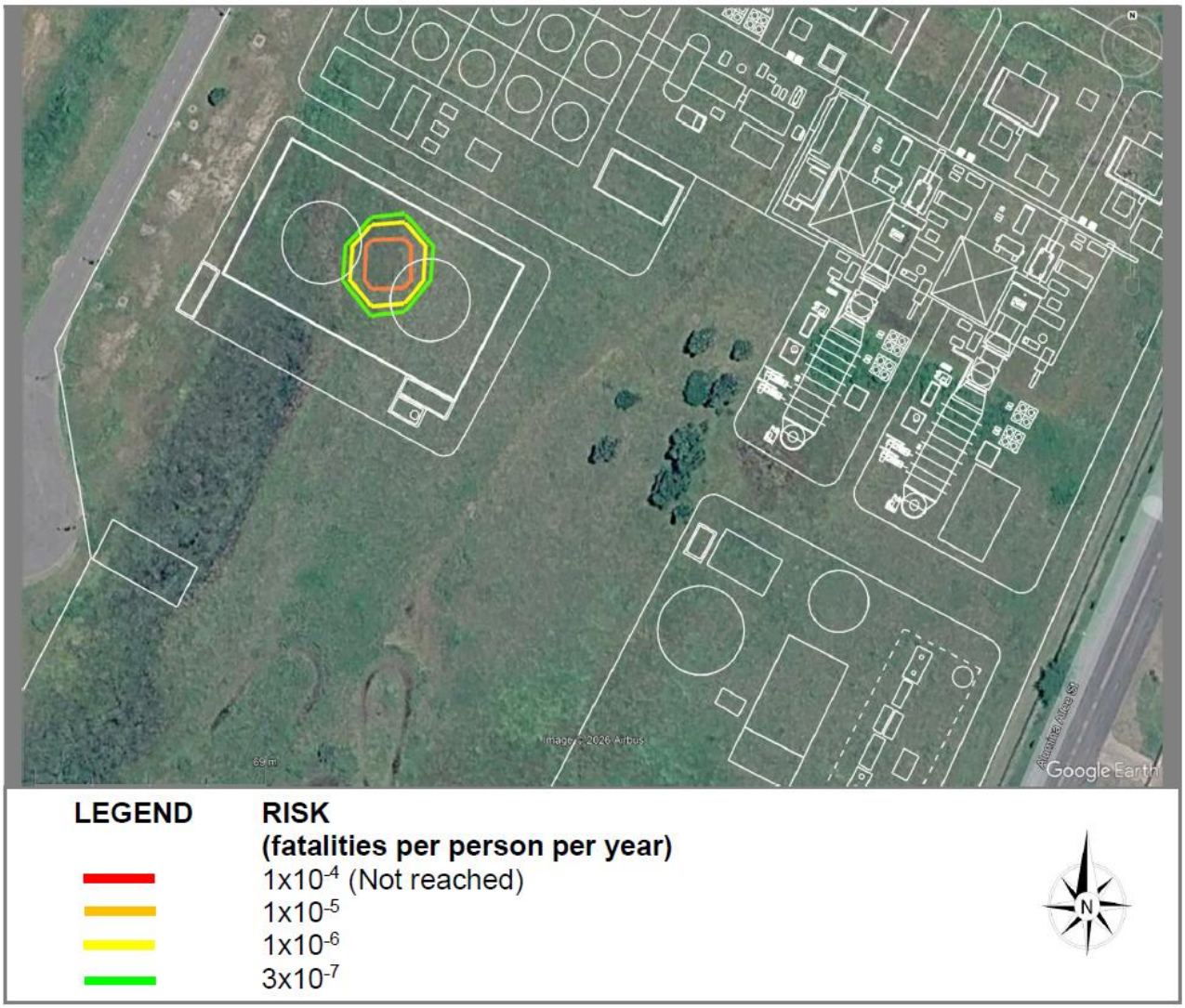

Figure 90: Lethal probability isopleths associated with the bulk storage tanks (RISCOM, 2026)

13.18.1.3 Combined Site Individual Risk

Considering the extent of the consequences of the releases assessed, as well as the frequency of occurrence of each release, the combined site risk is the summation of all the individual risks and is shown in Figure 91 below.

Individual risks describe the chance of fatality of an individual situated at a particular location, due to the operations on site. The maximum individual risk assumes that an individual is situated at a

particular location 24 hours per day for 365 days per year. This tends to be an overstatement of risk, but one which is generally accepted as sufficiently conservative.

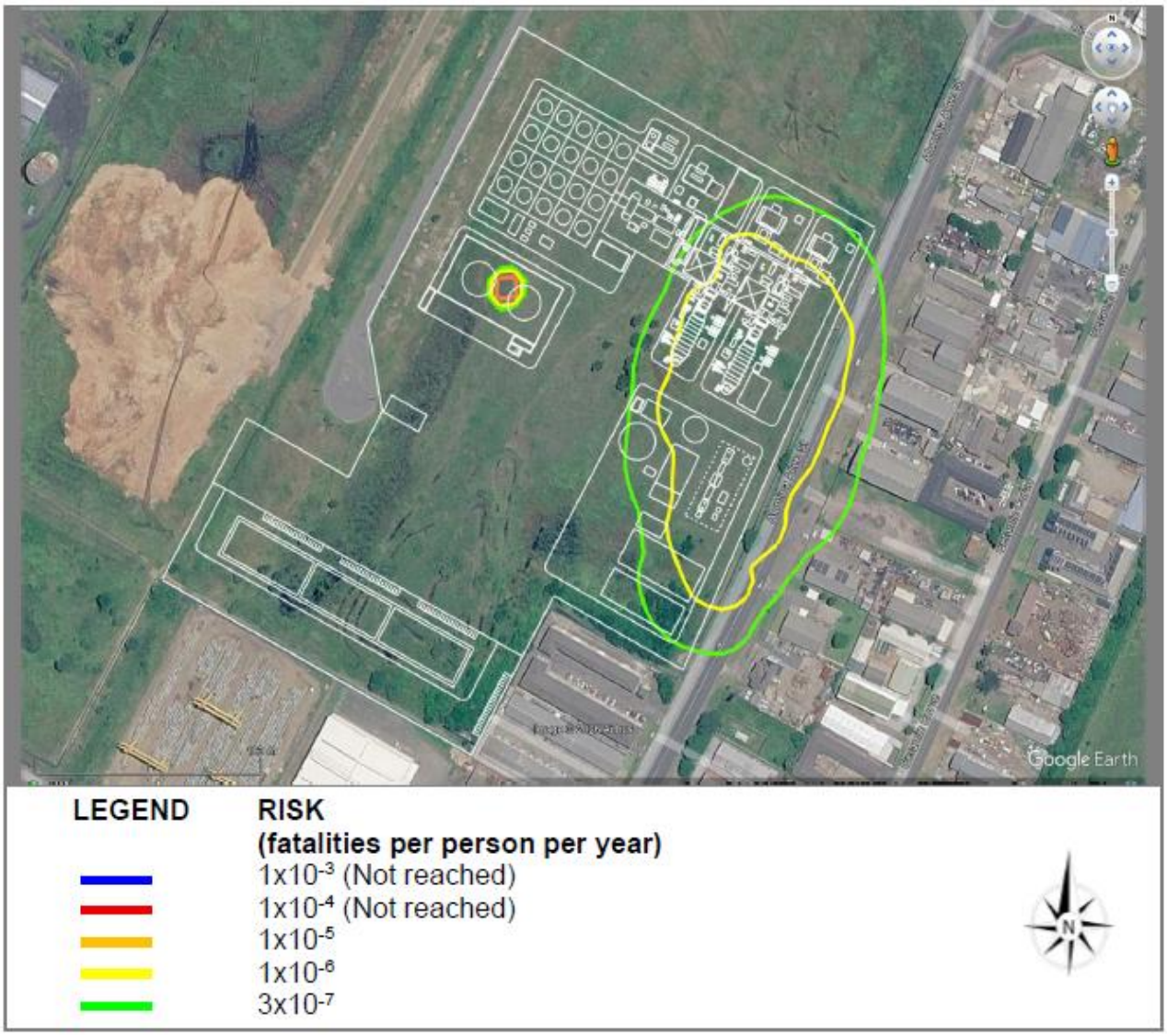

Figure 91: Individual risk contours – combined risk (RISCOM, 2026)

The individual risk contours illustrated in Figure 91 extend as follows:

- The $3x10^{-7}$ fatalities per person per year contour extends beyond the site boundary. This contour represents the threshold for 'trivial' risk and represent acceptability to vulnerable people outside of the isopleth. Risks below this threshold is considered trivial;
- The risks between the $3x10^{-7}$ and $1x10^{-5}$ fatalities per person per year is considered 'broadly acceptable' to the general public, but 'tolerable if proven to be within ALARP for vulnerable populations such as hospitals, retirement homes, nursery schools, prisons, large gatherings in the open, and so forth;
- The $1x10^{-4}$ fatalities per person per year extends offsite indicating acceptable risks to both the workers and the public; and

- The $1x10^{-3}$ fatalities per person per year contour, is considered excessive to workers and would have to be mitigated prior to construction. This is related to the assumed LNG storage and particularly the overfilling protection.

No new land planning should be approved without the consultation of the Planning Advice for Developments near Hazardous Installations (PADHI) land-planning tables described in Appendix C of the of the Quantitative Risk Assessment Report.

13.18.2 Mitigation Measures

The key risk reduction measures identified in the Quantitative Risk Assessment include:

- Natural gas pipeline installation:
  - Instrumentation, to determine significant loss of containment, such as pressure transmitters could be used to activate emergency shutdown systems reducing the loss of containment impacts. As the risks from the hydrogen storage are currently not excessive to both the workers and the public, risks reduction would be at the discretion of the owner and the engineering contractor.
  - An Emergency Shutdown Valve has been included at the interface between the main incoming pipeline and the power plant pipeline. This will reduce the impacts in the event of a loss of containment
- Minimisation of hazardous material inventories, where practicable, to reduce the potential consequences of accidental releases while maintaining operational requirements.
- Substitution of hazardous substances with less hazardous alternatives where feasible, thereby reducing inherent process risks.
- Undertaking detailed Process Hazard Analyses, including formal hazard identification studies such as HAZOPs, to identify process hazards, evaluate safeguards and inform additional risk reduction measures.
- Compliance with recognised engineering codes, standards and industry best practices for the design, construction and operation of facilities handling hazardous materials.
- Implementation of Safety Instrumented Systems designed in accordance with applicable international standards to ensure adequate protection against abnormal operating conditions and major accident scenarios.
- Independent review and auditing of safety systems and risk management measures to confirm that safety functions remain effective throughout the operational life of the facility.

The volumes of hazardous materials present on the site during normal operations are listed in Table 22 above. Measures for the safe and correct storage of hazardous materials are further provided in Section 9.6.1.16 above.

13.19 Waste and Wastewater

13.19.1 Impact Description

Typical waste streams associated with a CCGT Power Plant are listed in Table 76 below. Refer to Sections 9.5.5 and 9.5.11.20 above for a discussion on the liquid waste to be produced during the operational phase of the Plant.

Table 76: Typical waste streams associated with a CCGT Power Plant

Waste Category	Waste Type	Source / Activity
General Waste	Domestic refuse	Offices, control rooms, ablutions and canteens
	Paper and cardboard	Administrative and packaging activities
	Plastic waste	Packaging materials and consumables
	Glass	Domestic and office activities
	Scrap wood and pallets	Deliveries and maintenance activities
Hazardous Waste	Waste lubricating oil	Gas turbines, steam turbine, pumps and rotating equipment
	Hydraulic oil	Steam turbine hydraulic systems
	Transformer oil	Transformer maintenance and replacement
	Oil sludge	Oil-water separator system
	Oily rags and absorbents	Maintenance and spill response activities
	Contaminated soil	Fuel, oil or chemical spill incidents
	Used oil and fuel filters	Equipment maintenance
	Spent chemical containers	Water treatment and chemical dosing systems
	Waste batteries	UPS systems, vehicles and emergency systems
	Fluorescent lamps and bulbs	Buildings and ancillary infrastructure
	Electronic waste (e-waste)	Control systems, instrumentation and office equipment
Process Waste	Spent ion exchange resins	Demineralisation (Demin) Plant
	Spent RO membranes	Reverse osmosis water treatment system
	Cooling tower sludge	Cooling water treatment processes
	Scale and fouling deposits	Cooling water and steam systems
	Scrap metal	Equipment replacement and maintenance outages
	Insulation, gaskets and maintenance debris	Planned maintenance and outages
Wastewater / Effluent	Domestic sewage	Ablutions and kitchens
	Cooling tower blowdown	Cooling water system
	Oily wastewater	Floor drains, turbines, transformers and maintenance areas
	Turbine wash water	Turbine cleaning activities
	Floor wash water	Maintenance and housekeeping activities
	Demin plant regeneration wastewater	Ion exchange resin regeneration
	RO brine	Reverse osmosis system
	Chemical-contaminated wastewater	Chemical storage and handling areas
	Oil-contaminated stormwater	Bunded areas and oil handling areas
	Chemical-contaminated stormwater	Chemical storage and handling areas

The potential impacts associated with the waste streams to be generated by the proposed Plant include:

- Soil contamination from oils, fuels, chemicals and hazardous wastes;
- Groundwater contamination due to the site's highly permeable sandy soils and shallow groundwater conditions;
- Surface water contamination associated with wastewater discharges, contaminated stormwater and accidental spills;
- Increased waste generation requiring disposal, recycling and treatment capacity;
- Human health and safety risks associated with hazardous wastes and contaminated materials;
- Visual and nuisance impacts associated with poor waste management practices; and
- Resource consumption and loss of recyclable materials where waste minimisation and recycling measures are not implemented.

13.19.2 Impact Assessment

Theme	**Waste & wastewater**
Relevant Alternatives & Activities	**Generation of project-related waste**
Project life-cycle	**Construction and operational phases**
Proposed Management Objectives / Mitigation Measures	
▪ Implement an integrated waste management hierarchy focused on avoidance, minimisation, reuse, recycling and disposal as a last resort. ▪ Segregate waste streams at source and provide clearly labelled waste receptacles. ▪ Store hazardous waste in designated, covered and bunded areas. ▪ Waste to be disposed of at a licenced waste disposal facility. ▪ Maintain waste manifests and disposal records for all waste transported off site. ▪ Recycle scrap metal, waste batteries, electronic waste and other recyclable materials through approved recyclers. ▪ Route oily wastewater through oil-water separators before discharge. ▪ Route chemical-contaminated wastewater to the neutralisation system for treatment prior to discharge. ▪ Manage cooling tower blowdown and process effluents in accordance with applicable discharge requirements. ▪ Implement spill prevention and emergency response procedures. ▪ Conduct regular inspections of waste storage, wastewater infrastructure and containment systems. ▪ Train personnel in waste handling, storage and emergency response procedures.	

	+/- Impacts	**Extent**	**Magnitude**	**Duration**	**Probability**	**Significance**
Before Mitigation	-	local	medium-high	long-term	likely	Moderate
After Mitigation	-	local	low	long-term	unlikely	Minor

13.20 Health

The outcomes of the Community Health Impact Assessment (Niara Environmental Consultants, 2026) are presented below. The specialist report is contained in **Appendix E10**.

13.20.1 Impact Assessment

The Community Health Impact Assessment considered health effects arising from:

- Stack emissions and cumulative airshed exposure;
- Construction dust, diesel exhaust and vehicle emissions;
- Cooling tower drift and biological aerosol risk;
- Stormwater and wastewater contamination pathways;
- Occupational hazards linked to combustion turbines, HRSGs, steam systems, electrical infrastructure, confined spaces and heat load;
- Project-related traffic and heavy vehicle movement;
- Labour influx and changes in social determinants of health;
- Health system pressure;
- Psychosocial risk perception associated with visible industrial expansion.

The assessment distinguished between community health impacts and occupational health impacts. Community impacts are typically lower-dose, longer-duration and cumulative, while occupational exposures may be higher intensity and more immediate. The site is located in an already industrialised area where surrounding communities are exposed to existing air emissions, industrial traffic, port-related activity and socio-economic vulnerability. For this reason, several impact ratings are driven by cumulative exposure rather than project emissions or activities in isolation.

The sub-sections to follow assess potential health impacts across the various EHAs listed in 12.11.4 above.

13.20.1.1 EHA #1: Vector-related Diseases

Vector-related disease risk is not expected to be a dominant health impact of the proposed CCGT Power Plant under normal operating conditions. The project site is situated within an industrial estate and the baseline studies do not indicate an established vector-borne disease hotspot at the site. However, the hydrological assessment confirms that the site drains toward a man-made canal along the western boundary, which has developed wetland-like characteristics. The same assessment identifies flood-sensitive areas, stormwater management requirements and the need to manage runoff, sediment and potential contamination.

The project-specific vector pathway is therefore linked to standing water and poor housekeeping, not to the combustion process itself. Potential breeding environments may be created if construction materials, tyres, drums, open containers, poorly drained excavations, blocked drains, stormwater ponds or stagnant water around cooling and wastewater systems are not managed. During operation, cooling water infrastructure, drainage channels, sumps and stormwater retention structures must be designed and maintained to avoid stagnation and mosquito breeding.

The principal health outcomes would be nuisance vector proliferation, increased mosquito breeding, rodent attraction and secondary disease risk. Given the industrial context, formal

stormwater design and manageable nature of the pathway, the impact is rated as negligible before mitigation and remains negligible after mitigation.

Table 77: EHA #1 Impact Evaluation (Niara Environmental Consultants, 2026)

EHA #1: Vector-related Diseases	Impact Rating Without Mitigation	Impact Rating With Mitigation
Extent (Local, Regional, International)	Site or Local (2)	Site or Local (2)
Duration (Short term, Medium term, Long term)	Long Term > 5 years (4)	Long Term > 5 years (4)
Magnitude (Major, Moderate, Minor)	Low (2)	Very Low (1)
Probability (Definite, Possible, Unlikely)	Possible (2)	Unlikely (1)
Reversibility: (Reversible, Recoverable or Irreversible)	Reversible (1)	Reversible (1)
Calculated Significance Rating (Low, Medium, High)	Negligible (-18)	Negligible (-8)
Impact Status: (positive or negative)	Negative	Negative
Irreplaceable loss of resources: (Yes or No)	No	No
Can impacts be enhanced: (Yes or No)	No	No

Residual impacts

- Localised mosquito or nuisance vector breeding may occur in poorly drained stormwater areas, open containers, construction laydown areas, sumps or stagnant water bodies.
- Rodent attraction may occur where food waste and general waste are poorly managed.
- Residual risk is expected to remain negligible if drainage, waste management and cooling water systems are properly maintained.

Mitigation measures

- Design stormwater infrastructure to prevent stagnant water accumulation.
- Inspect and maintain drains, sumps, culverts, stormwater channels and retention structures.
- Remove standing water from construction areas, laydown yards and excavations.
- Store tyres, drums and containers under cover or upside down to prevent water accumulation.
- Implement strict waste management and housekeeping controls.
- Include vector monitoring in environmental inspections during construction and early operation.
- Maintain cooling water systems in accordance with Legionella and biological risk management requirements.

13.20.1.2 EHA #2: Acute Respiratory Infections and Respiratory Effects

Respiratory health is one of the most material health pathways for the proposed Project. The CCGT plant's combustion turbines will generate stack emissions containing NOx/NO_2, SO_2, PM_{10} and CO. Although the AIR indicates that project-alone concentrations are predicted to remain relatively low compared to NAAQS, cumulative scenarios with existing and approved future industrial sources

predict exceedances for short-term SO_2, NO_2 and PM_{10}. Existing Richards Bay monitoring also indicates elevated baseline SO_2 conditions.

The health concern is therefore not the Plant in isolation, but incremental emissions entering an already burdened airshed. The main exposure pathway is inhalation of pollutants from stack emissions, construction dust, diesel-powered construction equipment, vehicle emissions and cumulative industrial sources. Sensitive receptors include nearby residential areas, schools, clinics, children, elderly persons and individuals with pre-existing asthma, chronic obstructive pulmonary disease (COPD), cardiovascular disease or other chronic illness.

Construction-phase respiratory impacts will be driven primarily by dust from site clearance, earthworks, haul roads and diesel exhaust. Operational impacts will be driven by stack emissions from combustion turbines and cumulative airshed exposure. Cooling tower visible plumes are primarily water vapour and do not, on their own, constitute air pollution; however, they may heighten community perception of air quality risk.

With strict emissions control, compliance with the AEL, dust management and air quality monitoring, the residual respiratory health impact is reduced but not eliminated because cumulative airshed stress remains present.

Table 78: Impact Evaluation – EHA #2 (Niara Environmental Consultants, 2026)

EHA #2: Acute Respiratory Infections and Respiratory Effects	Impact Rating Without Mitigation	Impact Rating With Mitigation
Extent (Local, Regional, International)	Regional (3)	Regional (3)
Duration (Short term, Medium term, Long term)	Long Term > 5 years (4)	Long Term > 5 years (4)
Magnitude (Major, Moderate, Minor)	Medium (3)	Low (2)
Probability (Definite, Possible, Unlikely)	Likely (3)	Possible (2)
Reversibility: (Reversible, Recoverable or Irreversible)	Recoverable (3)	Recoverable (3)
Calculated Significance Rating (Low, Medium, High)	Low (-39)	Low (-24)
Impact Status: (positive or negative)	Negative	Negative
Irreplaceable loss of resources: (Yes or No)	Yes – severe respiratory events may result in irreversible morbidity or mortality among vulnerable receptors	Yes – residual risk remains for vulnerable receptors
Can impacts be enhanced: (Yes or No)	No	No

Residual impacts

- Residual respiratory risk remains for vulnerable groups due to cumulative airshed exposure.
- Short-term pollution peaks may still trigger asthma or COPD symptoms in sensitive individuals.
- Construction dust may cause localised irritation if controls lapse.
- Occupational respiratory exposures remain possible during maintenance, confined-space work and abnormal combustion conditions.

Mitigation measures

- ❑ Implement all Air Quality Impact Assessment and AEL emission controls.
- ❑ Maintain combustion efficiency and turbine tuning to minimise NOx and CO.
- ❑ Implement continuous or periodic stack emissions monitoring as required by the AEL.
- ❑ Monitor ambient air quality and complaints linked to odour, plume perception or respiratory symptoms.
- ❑ Implement dust suppression during construction.
- ❑ Maintain haul roads and minimise exposed surfaces.
- ❑ Avoid unnecessary idling of construction equipment and heavy vehicles.
- ❑ Provide occupational respiratory protection where task-based exposure assessments indicate need.
- ❑ Include respiratory health awareness in worker and community health communication.

The health outcomes associated with the identified pollutants are supported by established dose-response relationships, with epidemiological evidence demonstrating that incremental increases in pollutants such as $PM_{2.5}$, NO_2 and SO_2 are associated with measurable increases in morbidity and mortality, even at low concentrations (WHO, 2021; Burnett *et al*., 2018, as cited in (Niara Environmental Consultants, 2026). This reinforces the importance of controlling incremental emissions within an already burdened airshed.

These health outcomes are supported by well-established dose-response relationships, confirming that even incremental increases in pollutants such as $PM_{2.5}$ and NO_2 are associated with measurable increases in morbidity and mortality, particularly in already burdened environments.

13.20.1.3 EHA #3: Veterinary Medicine and Zoonotic Diseases

Zoonotic disease is not expected to be a material project-related health impact. The site is located within an industrial estate rather than an agricultural or livestock interface, and no evidence has been identified of active zoonotic disease risk linked to the project footprint. The possible pathway is indirect and limited: labour influx, informal food vending, waste mismanagement or increased stray animals around worker areas could attract rodents, dogs or other animals.

Given the absence of a clear project-specific zoonotic pathway and the lack of baseline evidence indicating a zoonotic disease hotspot, this EHA is discussed but not formally rated. The risk is managed through waste control, worker accommodation standards, pest control and prohibition of animals in construction camps or operational areas.

Mitigation measures

- ❑ Prohibit animals in construction camps, laydown areas and operational areas.
- ❑ Implement rodent and pest control.
- ❑ Ensure food waste is stored in sealed containers and removed regularly.
- ❑ Manage informal food vending around site access points through site rules and municipal liaison.

- ❑ Include rabies awareness and bite reporting in worker induction where relevant.

13.20.1.4 EHA #4: Sexually Transmitted Infections, including HIV/AIDS

HIV and STI risk is a relevant social health pathway for large infrastructure projects in KZN. The proposed Project will generate construction employment and may attract job seekers, contractors, transport workers and service providers into the Richards Bay area. The Socio-Economic Impact Assessment identifies employment creation and economic benefits, but also notes existing unemployment, labour market vulnerability and socio-economic inequality in the broader area.

The pathway is not linked to the CCGT technology itself. It is linked to labour influx, temporary workforce arrangements, increased disposable income, mobility, transactional relationships, alcohol use and unequal economic benefit distribution. The risk is highest during the construction phase, when the workforce is larger and more transient. Operational-phase risk is lower due to a smaller permanent workforce but may persist through contractors and maintenance shutdowns.

With a workplace and community HIV/STI programme, local recruitment, worker code of conduct and referral to existing health services, the residual impact is expected to be negligible.

Table 79: Impact Evaluation – EHA #42 (Niara Environmental Consultants, 2026)

EHA #4: Sexually Transmitted Infections, including HIV/AIDS	Impact Rating Without Mitigation	Impact Rating With Mitigation
Extent (Local, Regional, International)	Site or Local (2)	Site or Local (2)
Duration (Short term, Medium term, Long term)	Long Term > 5 years (4)	Long Term > 5 years (4)
Magnitude (Major, Moderate, Minor)	Low (2)	Very Low (1)
Probability (Definite, Possible, Unlikely)	Possible (2)	Unlikely (1)
Reversibility: (Reversible, Recoverable or Irreversible)	Recoverable (3)	Reversible (1)
Calculated Significance Rating (Low, Medium, High)	Low (-22)	Negligible (-8)
Impact Status: (positive or negative)	Negative	Negative
Irreplaceable loss of resources: (Yes or No)	Yes – unmanaged HIV infection may result in long-term morbidity and mortality	No, with effective prevention and treatment referral
Can impacts be enhanced: (Yes or No)	No	No

Residual impacts

- ❑ Possible increase in STI exposure linked to workforce mobility and transactional relationships.
- ❑ Possible increase in demand for HIV testing, condoms and Primary Health Care (PHC) services.
- ❑ Residual risk remains during peak construction and major maintenance shutdown periods.

Mitigation measures

- ❑ Develop and implement a workplace HIV/AIDS and STI prevention programme.

- ❑ Provide voluntary counselling and testing referral information.
- ❑ Provide condoms and sexual health information at worker facilities.
- ❑ Implement a worker code of conduct addressing sexual exploitation, harassment and gender-based violence.
- ❑ Prioritise local employment where feasible to reduce influx-related risk.
- ❑ Engage local clinics and NGOs for referral pathways.
- ❑ Provide targeted education during induction and toolbox talks.
- ❑ Monitor worker accommodation, transport and camp conditions.

13.20.1.5 EHA #5: Soil-, Water- and Waste-related Diseases

Soil-, water- and waste-related disease risk is linked to the Project's stormwater, wastewater, cooling water, fuel handling and waste management systems. The Hydrology Assessment confirms that the site drains toward a canal with wetland-like characteristics and that baseline water quality is generally acceptable. However, it also identifies flood risk, stormwater contamination, hydrocarbon contamination, sediment mobilisation and the need for clean/dirty water separation.

This impact is therefore not based on existing poor water quality. It is based on the potential for project-related failure events. Credible pathways include contaminated runoff from maintenance areas, transformer oil leaks, fuel or lube oil spills, cooling tower blowdown mismanagement, contaminated firewater, sewage mismanagement, waste storage failure and flooding that mobilises pollutants into receiving water systems.

Potential health outcomes include dermal irritation, gastrointestinal illness, nuisance odours, vector breeding, indirect ecological impacts and downstream environmental health effects. With proper stormwater engineering, wastewater handling, bunding, spill response and monitoring, the residual risk is negligible.

Table 80: Impact Evaluation – EHA #5 (Niara Environmental Consultants, 2026)

EHA #5: Soil-, Water- and Waste-related Diseases	Impact Rating Without Mitigation	Impact Rating With Mitigation
Extent (Local, Regional, International)	Site or Local (2)	Site or Local (2)
Duration (Short term, Medium term, Long term)	Long Term > 5 years (4)	Long Term > 5 years (4)
Magnitude (Major, Moderate, Minor)	Medium (3)	Low (2)
Probability (Definite, Possible, Unlikely)	Possible (2)	Unlikely (1)
Reversibility: (Reversible, Recoverable or Irreversible)	Recoverable (3)	Reversible (1)
Calculated Significance Rating (Low, Medium, High)	Low (-24)	Negligible (-9)
Impact Status: (positive or negative)	Negative	Negative
Irreplaceable loss of resources: (Yes or No)	No	No
Can impacts be enhanced: (Yes or No)	No	No

Residual impacts

- Localised contamination may occur if spill control, bunding or stormwater separation fails.
- Flooding may mobilise contaminants if storage areas are not designed above flood-sensitive zones.
- Cooling tower blowdown and wastewater mismanagement may affect receiving water quality.
- Poor waste handling may attract pests and contribute to nuisance conditions.

Mitigation measures

- Implement the stormwater management plan and maintain clean/dirty water separation.
- Bund all fuel, oil, chemical and transformer areas.
- Provide oil-water separators where hydrocarbon contamination is credible.
- Develop and implement a spill prevention and response plan.
- Store hazardous waste in designated, covered, bunded areas.
- Manage cooling tower blowdown according to authorised discharge or disposal requirements.
- Ensure sewage and ablution systems are adequate during construction.
- Undertake surface water monitoring upstream and downstream of the site.
- Prohibit washing, refuelling or maintenance outside designated controlled areas.
- Ensure firewater containment capacity for credible fire scenarios.

13.20.1.6 EHA #6: Food and Nutrition-related Issues

The proposed Project will not directly remove agricultural land or disrupt subsistence farming, as the site is within an industrial development zone. Food and nutrition impacts are therefore indirect and socio-economic. The Socio-Economic Impact Assessment indicates that the Project is expected to generate employment and household income benefits during construction, although local benefit capture will depend on procurement, recruitment and skills availability.

Positive nutrition-related outcomes may arise where local workers and suppliers benefit from income, improving household food security. Negative outcomes may occur if labour influx and increased demand place pressure on housing, food prices or essential services, particularly for low-income households. These effects are most likely during construction and are expected to be limited if local procurement, local employment and worker accommodation are managed.

Table 81: Impact Evaluation – EHA #6 (Niara Environmental Consultants, 2026)

EHA #6: Food and Nutrition-related Issues	Impact Rating Without Mitigation	Impact Rating With Mitigation
Extent (Local, Regional, International)	Regional (3)	Site or Local (2)
Duration (Short term, Medium term, Long term)	Short-Medium Term (2)	Short-Medium Term (2)
Magnitude (Major, Moderate, Minor)	Low (2)	Very Low (1)
Probability (Definite, Possible, Unlikely)	Possible (2)	Unlikely (1)
Reversibility: (Reversible, Recoverable or Irreversible)	Reversible (1)	Reversible (1)
Calculated Significance Rating (Low, Medium, High)	Negligible (-16)	Negligible (-6)
Impact Status: (positive or negative)	Negative	Negative

EHA #6: Food and Nutrition-related Issues	Impact Rating Without Mitigation	Impact Rating With Mitigation
Irreplaceable loss of resources: (Yes or No)	No	No
Can impacts be enhanced: (Yes or No)	Yes – positive income and local procurement benefits can be enhanced	Yes

Residual impacts

- Temporary pressure on local food prices, rentals and basic goods may occur during peak construction.
- Lower-income households may be more sensitive to price increases.
- Positive nutrition benefits may occur where local households receive employment or supplier income.

Mitigation measures

- Prioritise local recruitment and procurement where feasible.
- Avoid unmanaged worker accommodation that increases pressure on local housing.
- Support local catering and food suppliers where safe and compliant.
- Prevent informal, unhygienic food vending at site access points.
- Include worker nutrition, hydration and heat stress prevention in occupational health programmes.
- Communicate employment processes clearly to reduce unrealistic expectations.

13.20.1.7 EHA #7: Accidents and Injuries

Accidents and injuries represent a material health pathway for the proposed Project. The pathway is driven by construction activities, heavy vehicle movement, abnormal loads, road traffic, working at heights, lifting operations, pressurised steam systems, gas systems, electrical infrastructure, confined spaces, cooling water systems and maintenance activities.

The Traffic Impact Assessment confirms that the Project is located within an existing industrial transport network where roads such as the R619 and Alumina Allee already support industrial movement. Increased construction traffic, worker transport, deliveries and operational logistics may increase road safety risk, particularly where heavy vehicles interact with public roads, pedestrians, public transport users and nearby communities.

Occupational injury risks include falls, burns, electrocution, confined-space exposure, mechanical injury, steam release, heat stress, chemical exposure and emergency incidents. Without mitigation, the significance is moderate due to the potential for severe injury or fatality. With strict implementation of occupational health and safety systems, traffic management and emergency response controls, residual significance is reduced to low.

Table 82: Impact Evaluation – EHA #7 (Niara Environmental Consultants, 2026)

EHA #7: Accidents/Injuries	Impact Rating Without Mitigation	Impact Rating With Mitigation
Extent (Local, Regional, International)	Regional (3)	Regional (3)
Duration (Short term, Medium term, Long term)	Long Term > 5 years (4)	Long Term > 5 years (4)
Magnitude (Major, Moderate, Minor)	Medium (3)	Low (2)
Probability (Definite, Possible, Unlikely)	Likely (3)	Possible (2)
Reversibility: (Reversible, Recoverable or Irreversible)	Irreversible (5)	Recoverable (3)
Calculated Significance Rating (Low, Medium, High)	Moderate (-45)	Low (-24)
Impact Status: (positive or negative)	Negative	Negative
Irreplaceable loss of resources: (Yes or No)	Yes – severe incidents may result in loss of life	Yes – residual fatality risk remains but is materially reduced
Can impacts be enhanced: (Yes or No)	No	No

Residual impacts

- Residual road accident risk from heavy vehicles and abnormal loads.
- Residual occupational injury risk during maintenance, shutdowns and confined-space work.
- Residual emergency response risk associated with fire, gas release, steam release or electrical faults.

Mitigation measures

- Develop and implement a construction traffic management plan.
- Separate pedestrian, light vehicle and heavy vehicle routes where feasible.
- Enforce speed limits and driver fitness requirements.
- Schedule abnormal loads outside peak traffic periods where possible.
- Implement road signage, flagging and traffic control at access points.
- Apply the Occupational Health and Safety Act and project-specific OHS management system.
- Implement permit-to-work systems for hot work, confined spaces, electrical isolation and work at heights.
- Undertake emergency drills for gas release, fire, electrical incident and medical response.
- Maintain first aid, emergency transport and referral arrangements with local health facilities.
- Ensure contractor safety management and incident reporting.

13.20.1.8 EHA #8: Exposure to Potentially Hazardous Materials, Noise and Malodours

EHA #8 is directly linked to the technical process flow of the CCGT Plant. Relevant sources include stack emissions, gas supply interface, combustion turbines, HRSGs, cooling tower drift, transformer oils, lube oils, hydraulic fluids, maintenance chemicals, diesel backup systems, fire suppression systems, wastewater systems and hazardous waste storage.

The AQIA identifies NOx, SO_2, PM_{10} and CO as the principal operational pollutants. The noise assessment found low community noise significance, although Wild en Weide and nearby hostels

were identified as noise-sensitive receptors and occupational noise compliance remains required. The hydrology study identifies hydrocarbon contamination and stormwater failure as potential risks.

Community exposure is expected to be mainly chronic and cumulative through air emissions and perception of industrial risk. Occupational exposure is more direct and includes chemicals, fumes, heat, noise, confined spaces and electrical hazards. Malodour is not expected to be a dominant routine impact, but abnormal events, poor waste management, fuel spills or wastewater issues could create nuisance and health concern.

Table 83: Impact Evaluation – EHA #8 (Niara Environmental Consultants, 2026)

EHA #8: Exposure to Potentially Hazardous Materials, Noise and Malodours	Impact Rating Without Mitigation	Impact Rating With Mitigation
Extent (Local, Regional, International)	Regional (3)	Site or Local (2)
Duration (Short term, Medium term, Long term)	Long Term > 5 years (4)	Long Term > 5 years (4)
Magnitude (Major, Moderate, Minor)	Medium (3)	Low (2)
Probability (Definite, Possible, Unlikely)	Likely (3)	Possible (2)
Reversibility: (Reversible, Recoverable or Irreversible)	Recoverable (3)	Recoverable (3)
Calculated Significance Rating (Low, Medium, High)	Low (-39)	Low (-22)
Impact Status: (positive or negative)	Negative	Negative
Irreplaceable loss of resources: (Yes or No)	Yes – acute hazardous incidents may cause serious injury or mortality	Yes – low residual risk remains
Can impacts be enhanced: (Yes or No)	No	No

Residual impacts

- Residual cumulative air emissions exposure.
- Occupational exposure to maintenance chemicals, lube oils, transformer oils, heat, noise and confined-space hazards.
- Potential cooling tower drift and Legionella risk if water systems are poorly managed.
- Potential nuisance or perceived risk from visible plumes, odours or abnormal events.
- Low residual community noise exposure.

Mitigation measures

- Implement hazardous chemical substance risk assessments.
- Maintain updated Safety Data Sheets and chemical inventories.
- Store chemicals, oils and fuels in bunded, labelled, controlled areas.
- Implement occupational hygiene monitoring for noise, heat, fumes and chemicals.
- Implement hearing conservation for relevant workers.
- Maintain cooling tower water treatment and Legionella monitoring programme.
- Maintain transformer bunding, firewater containment and spill response capability.
- Monitor and investigate odour, plume and health-related complaints.
- Ensure noise controls are applied to plant equipment and worker exposure areas.

- ❑ Include hazardous material and emergency response training in induction.

13.20.1.9 EHA #9: Social Determinants of Health

13.20.1.9.1 Negative Pathways

The Project may influence social determinants of health through labour influx, employment expectations, local procurement, income distribution, pressure on housing, pressure on services, perceptions of unequal benefit, social tension, gendered vulnerability and psychosocial stress. These impacts are particularly relevant in the CoU and KCDM, where unemployment and inequality remain material baseline vulnerabilities.

Negative impacts may arise if communities perceive employment opportunities as unfair, if non-local workers dominate employment, if temporary workers increase pressure on housing and services, or if increased disposable income contributes to alcohol use, substance use, transactional relationships or gender-based violence. These impacts are not caused by combustion technology itself but by the social dynamics associated with large infrastructure projects.

Table 84: Impact Evaluation – EHA #9 (Niara Environmental Consultants, 2026)

EHA #9: Social Determinants of Health – Negative Pathways	Impact Rating Without Mitigation	Impact Rating With Mitigation
Extent (Local, Regional, International)	Regional (3)	Regional (3)
Duration (Short term, Medium term, Long term)	Long Term > 5 years (4)	Long Term > 5 years (4)
Magnitude (Major, Moderate, Minor)	Medium (3)	Low (2)
Probability (Definite, Possible, Unlikely)	Likely (3)	Possible (2)
Reversibility: (Reversible, Recoverable or Irreversible)	Recoverable (3)	Recoverable (3)
Calculated Significance Rating (Low, Medium, High)	Low (-39)	Low (-24)
Impact Status: (positive or negative)	Negative	Negative
Irreplaceable loss of resources: (Yes or No)	No	No
Can impacts be enhanced: (Yes or No)	No	No

Residual impacts

- ❑ Continued expectation pressure around employment and procurement.
- ❑ Possible psychosocial stress, community tension or grievance escalation.
- ❑ Possible pressure on housing, transport and services during construction.
- ❑ Possible gendered vulnerability and substance-related harms.

Mitigation measures

- ❑ Develop a transparent local employment and procurement plan.
- ❑ Communicate recruitment criteria clearly through recognised channels.
- ❑ Establish a grievance mechanism accessible to workers and communities.
- ❑ Implement worker code of conduct.

- ❑ Provide Gender Based Violence (GBV), harassment, substance abuse and community conduct training.
- ❑ Manage worker accommodation to avoid pressure on local housing.
- ❑ Monitor social grievances, protest risk and community perceptions.
- ❑ Coordinate with local government and community structures on development expectations.

13.20.1.9.2 Positive Pathways

The proposed Project may generate positive health outcomes through employment, household income, skills development, local procurement and improved regional energy security. The Socio-Economic Impact Assessment indicates that construction will generate employment and household income effects, including direct, indirect and induced economic benefits.

Positive health outcomes may include improved household resilience, improved food security, improved access to healthcare, better educational continuity and reduced economic stress among beneficiary households. These benefits are most significant during construction but may also persist through operational employment, local supplier development and improved industrial energy reliability.

Table 85: Impact Evaluation – EHA #9 (Niara Environmental Consultants, 2026)

EHA #9: Social Determinants of Health – Positive Pathways	Impact Rating Without Enhancement	Impact Rating With Enhancement
Extent (Local, Regional, International)	National (4)	National (4)
Duration (Short term, Medium term, Long term)	Short-Medium Term (2)	Short-Medium Term (2)
Magnitude (Major, Moderate, Minor)	Medium (3)	Medium (3)
Probability (Definite, Possible, Unlikely)	Definite (5)	Definite (5)
Reversibility: (Reversible, Recoverable or Irreversible)	Recoverable (3)	Recoverable (3)
Calculated Significance Rating (Low, Medium, High)	Moderate (+60)	Moderate (+60)
Impact Status: (positive or negative)	Positive	Positive
Irreplaceable loss of resources: (Yes or No)	No	No
Can impacts be enhanced: (Yes or No)	Yes	Yes

Residual positive impacts

- ❑ Temporary household income increase.
- ❑ Local employment and supplier opportunities.
- ❑ Skills development and work experience.
- ❑ Improved household resilience among beneficiaries.
- ❑ Contribution to regional energy security and industrial stability.

Enhancement measures

- ❑ Prioritise local employment where skills are available.

- ❑ Develop skills development and training programmes.
- ❑ Use local subcontractors and suppliers where feasible.
- ❑ Provide transparent procurement processes.
- ❑ Track local employment, gender participation and supplier spend.
- ❑ Support youth and semi-skilled labour participation.
- ❑ Align social investment with health, skills and community resilience priorities.

13.20.1.10 EHA #10: Cultural Health Practices

The project area lies within a culturally diverse KZN context where health-seeking behaviour may include biomedical care, traditional medicine, spiritual care and complementary practices. Project-related health concerns such as respiratory symptoms, stress, perceived pollution, chronic illness or psychosocial distress may therefore not always be interpreted through biomedical frameworks alone.

The impact pathway is primarily linked to communication, trust and care-seeking behaviour. If project health communication is poorly designed, communities may delay formal care, misunderstand exposure risks or rely solely on informal channels. Conversely, culturally competent engagement can strengthen referral, early symptom recognition and community trust.

Table 86: Impact Evaluation – EHA #10 (Niara Environmental Consultants, 2026)

EHA #10: Cultural Health Practices	Impact Rating Without Mitigation	Impact Rating With Mitigation
Extent (Local, Regional, International)	Site or Local (2)	Site or Local (2)
Duration (Short term, Medium term, Long term)	Long Term > 5 years (4)	Long Term > 5 years (4)
Magnitude (Major, Moderate, Minor)	Medium (3)	Low (2)
Probability (Definite, Possible, Unlikely)	Possible (2)	Unlikely (1)
Reversibility: (Reversible, Recoverable or Irreversible)	Reversible (1)	Reversible (1)
Calculated Significance Rating (Low, Medium, High)	Negligible (-20)	Negligible (-9)
Impact Status: (positive or negative)	Negative	Negative
Irreplaceable loss of resources: (Yes or No)	No	No
Can impacts be enhanced: (Yes or No)	Yes – culturally appropriate health communication may improve care-seeking	Yes

Residual impacts

- ❑ Some community members may interpret project-related symptoms through cultural or spiritual frameworks.
- ❑ Delay in formal health-seeking may occur where symptoms are not recognised as requiring clinical care.
- ❑ Mistrust may persist if health messaging is not culturally appropriate.

Mitigation measures

- Develop culturally appropriate health communication material.
- Use isiZulu and English communication where appropriate.
- Engage community leaders, health workers and recognised local structures.
- Encourage early referral to clinics for respiratory symptoms, persistent cough, chest tightness, fever or acute illness.
- Avoid dismissing traditional health systems; instead, promote safe referral and complementary communication.
- Include project health information in stakeholder engagement and grievance processes.

13.20.1.11 EHA #11: Health Systems Issues

Health system impacts may occur through increased demand for PHC services, emergency care, occupational injury response, respiratory complaints, STI/HIV services and health surveillance. The report baseline identifies several healthcare facilities within the zone of influence, including public clinics, private facilities and hospitals, but also recognises capacity constraints within the broader municipal and district health system.

Project-related pressure is most likely during construction, when workforce numbers, traffic, injury risk and labour influx are highest. Operational demand may be lower but more specialised, involving occupational health, emergency preparedness, respiratory surveillance and potential industrial incident response.

The Project also creates an opportunity to strengthen health systems through referral planning, occupational health services, emergency response coordination and data-sharing mechanisms.

Table 87: Impact Evaluation – EHA #11 (Niara Environmental Consultants, 2026)

EHA #11: Health Systems Issues	Impact Rating Without Mitigation	Impact Rating With Mitigation
Extent (Local, Regional, International)	Regional (3)	Regional (3)
Duration (Short term, Medium term, Long term)	Long Term > 5 years (4)	Long Term > 5 years (4)
Magnitude (Major, Moderate, Minor)	Medium (3)	Low (2)
Probability (Definite, Possible, Unlikely)	Likely (3)	Possible (2)
Reversibility: (Reversible, Recoverable or Irreversible)	Recoverable (3)	Recoverable (3)
Calculated Significance Rating (Low, Medium, High)	Low (-39)	Low (-24)
Impact Status: (positive or negative)	Negative	Negative
Irreplaceable loss of resources: (Yes or No)	No	No
Can impacts be enhanced: (Yes or No)	Yes – referral and emergency systems can be strengthened	Yes

Residual impacts

- Increased demand for clinics and emergency services during construction.

- Residual risk of delayed emergency response if coordination is weak.
- Increased need for respiratory, STI/HIV and occupational health services.
- Potential health system pressure during major incidents.

Mitigation measures

- Develop a project health management plan.
- Establish referral arrangements with nearby clinics and hospitals.
- Maintain on-site first aid and occupational health capacity.
- Develop emergency medical response procedures.
- Coordinate with local emergency management services, fire services and healthcare providers.
- Conduct drills for gas release, fire, electrocution, heat illness and mass casualty scenarios.
- Maintain occupational health records and report notifiable incidents.
- Monitor health complaints and referral patterns during construction and operation.

13.20.1.12 EHA #12: Non-Communicable Diseases

Non-communicable disease impacts are linked to cumulative environmental exposure, psychosocial stress and socio-economic determinants. The most relevant project-related pathways are air emissions, particulate exposure, noise, stress, heat exposure and indirect changes in income and access to care.

The Air Quality Impact Assessment confirms that cumulative scenarios are more significant than project-alone emissions. Long-term exposure to PM, NO_2 and SO_2 is associated with respiratory and cardiovascular disease. Noise exposure is predicted to be low for communities, but occupational noise and cumulative industrial stress remain relevant. The noise study identifies low environmental significance overall, but recognises existing industrial and traffic noise conditions.

Non-communicable disease risk is not expected to be caused by the Project alone. Rather, the Project may contribute incrementally to pre-existing chronic disease vulnerability in an industrial airshed. Vulnerable groups include people with asthma, COPD, cardiovascular disease, diabetes, elderly persons and children.

Table 88: Impact Evaluation – EHA #12 (Niara Environmental Consultants, 2026)

EHA #12: Non-Communicable Diseases	Impact Rating Without Mitigation	Impact Rating With Mitigation
Extent (Local, Regional, International)	Regional (3)	Regional (3)
Duration (Short term, Medium term, Long term)	Long Term > 5 years (4)	Long Term > 5 years (4)
Magnitude (Major, Moderate, Minor)	Medium (3)	Low (2)
Probability (Definite, Possible, Unlikely)	Likely (3)	Possible (2)
Reversibility: (Reversible, Recoverable or Irreversible)	Irreversible (5)	Recoverable (3)

EHA #12: Non-Communicable Diseases	Impact Rating Without Mitigation	Impact Rating With Mitigation
Calculated Significance Rating (Low, Medium, High)	Moderate (-45)	Low (-24)
Impact Status: (positive or negative)	Negative	Negative
Irreplaceable loss of resources: (Yes or No)	Yes – chronic disease outcomes may be irreversible	Yes – residual risk remains for vulnerable receptors
Can impacts be enhanced: (Yes or No)	Yes – positive socio-economic determinants can indirectly improve NCD resilience	Yes

Residual impacts

- Residual cumulative respiratory and cardiovascular disease risk.
- Vulnerable individuals may experience worsening symptoms during pollution episodes.
- Occupational heat, noise and chemical exposure may contribute to chronic worker health risks.
- Psychosocial stress and perceived pollution risk may contribute to chronic stress burden.

Mitigation measures

- Implement air quality mitigation and monitoring required by the Air Quality Impact Assessment and AEL.
- Track respiratory and environmental health complaints.
- Provide worker medical surveillance for respiratory, hearing, heat stress and chemical exposure risks.
- Maintain occupational hygiene monitoring.
- Include non-communicable disease risk messaging in worker wellness programmes.
- Encourage early healthcare seeking for asthma, chest pain, shortness of breath, chronic cough and heat illness.
- Coordinate with local health facilities on referral pathways where appropriate.
- Maintain transparent communication on emissions, complaints and corrective actions.

13.21 Socio-Economic Environment

The outcomes of the Socio-Economic Impact Assessment (Urban-Econ, 2026) are presented below. The specialist report is contained in **Appendix E11**.

13.21.1 Impact Assessment

13.21.1.1 Construction Phase

The following impacts have been identified as likely to arise during the construction phase of the proposed CCPP.

13.21.1.1.1 Temporary increase in Production

Nature: **Temporary increase in Production**			
Impact Description: The initial capital investment in the Project will inject new business sales (production) into the economy, with multiplier effects benefitting related sectors. Based on the Social Accounting Matrix (SAM) modelling, approximately R33.3 billion in total production output across the economy is expected to be generated by the CAPEX. This total impact comprises the direct production generated by contractors and suppliers working on the Project, as well as the indirect and induced impacts that arise along the supply chain and through additional household spending, together forming the overall multiplier effect. The spatial distribution of this impact will depend on where goods and services are procured. While some sectors in and around Richards Bay may benefit directly, the bulk of higher-value manufacturing and engineering activity is expected to be captured by established national supply chains rather than being confined to the immediate municipal area. Most of the production output will likely accrue to those parts of the South African economy with the industrial and service capacity to support large-scale power infrastructure for example, major metros and industrial hubs such as Gauteng and eThekwini, alongside activity in Richards Bay and the CoU linked to on-site construction, logistics and support services. To maximise local benefits and deepen the positive production impact at regional and local level, it will be important to prioritise local procurement with a deliberate focus on contracting small and emerging businesses in and around the host area wherever this is technically and commercially feasible.			
	Rating	**Motivation**	**Significance (S=(E+D+M) P**
Before Mitigation/Enhancement			
Duration	Short-term (2)	This impact is confined to the 3-year construction period therefore it is short term in nature.	**Medium Positive (40)**
Extent	National (4)	Most of the production output will likely accrue to those parts of the South African economy with the industrial and service capacity to support large-scale power infrastructure developments such as the major metros and industrial hubs like Gauteng and eThekwini.	
Magnitude	Minor (2)	The impact magnitude within the Area of Influence (AOI) will therefore be limited by the spatial distribution of the impact.	
Probability	Definite (5)	The impact is considered definite because it arises directly from the project's capital expenditure. The resulting production effect is therefore expected to occur with certainty, provided the project proceeds.	
Mitigation/Enhancement Measures			
Enhancement measures: • Prioritise local procurement for direct construction activities as well as for support services where feasible. • Where feasible, encourage main contractors to sub-contract to local businesses for construction goods and services required.			
Post Mitigation/Enhancement Measures			
Duration	Short-term (2)	Unchanged as the enhancement measures do not influence this aspect of the impact.	**Medium Positive (50)**
Extent	National (4)	The extent remains national because the project will rely heavily on specialised inputs, technical services and supply chains that extend beyond the AOI.	
Magnitude	Low (4)	Magnitude rises to a limited extent as proposed enhancement measures increase the likelihood that a greater share of project-related expenditure will circulate within the AOI thus can improve local capture of construction-related production benefits.	
Probability	Definite (5)	Unchanged as the enhancement measures do not influence this aspect of the impact.	

13.21.1.1.2 Temporary increase in GDP

Nature: **Temporary increase in GDP**
Impact Description: During the construction phase, the capital investment is expected to generate a temporary increase in GDP (value added) within the economy. The stimulus will be driven by heightened demand for goods and services in sectors such as construction, materials supply, logistics, accommodation, catering and other services.

Nature: **Temporary increase in GDP**			
The SAM modelling results indicate that the capital expenditure is projected to result in a total GDP impact of approximately R10.27 billion across the South African economy. This total impact comprises the direct value added created by contractors and suppliers working on the Project, as well as the indirect and induced impacts that arise along the supply chain and through additional household spending, together forming the GDP multiplier effect. As with production, local firms in Richards Bay and the CoU will benefit from construction, logistics and service contracts but it is likely that a portion of the GDP impact will accrue to national industrial and service hubs (e.g. Gauteng, eThekwini and other major metros) where large engineering contractors, fabricators and professional service firms are based. The Project thus provides a positive but distributed GDP stimulus, with benefits felt at national, provincial and municipal levels rather than being confined solely to the immediate AOI. To maximise the retention of GDP benefits in the host region, it will be important to prioritise local procurement and contracting with a deliberate focus on small and emerging businesses that are based in or near the AOI where technically and commercially feasible.			
	Rating	**Motivation**	**Significance (S=(E+D+M) P**
Before Mitigation/Enhancement			
Duration	Short-term (2)	This impact is confined to the 3-year construction period therefore it is short term in nature.	**Medium Positive (40)**
Extent	National (4)	Most of the GDP output will likely accrue to those parts of the South African economy with the industrial and service capacity to support large-scale power infrastructure developments such as the major metros and industrial hubs like Gauteng and eThekwini.	
Magnitude	Minor (2)	The impact magnitude within the AOI will be limited by the spatial distribution of the impact.	
Probability	Definite (5)	The impact is considered definite because it arises directly from the project's capital expenditure. The resulting GDP effect is therefore expected to occur with certainty, provided the project proceeds.	
Mitigation/Enhancement Measures			
Enhancement measures: • Prioritise local procurement for direct construction activities as well as for support services where feasible.			
Post Mitigation/Enhancement Measures			
Duration	Short-term (2)	Unchanged as the enhancement measures do not influence this aspect of the impact.	**Medium Positive (40)**
Extent	National (4)	The extent remains national because the project will rely heavily on specialised inputs, technical services and supply chains that extend beyond the AOI.	
Magnitude	Minor (2)	Unchanged as, while the proposed enhancements may improve local participation to some extent, they are not expected to materially alter the magnitude of the GDP impact.	
Probability	Definite (5)	Unchanged as the enhancement measures do not influence this aspect of the impact.	

13.21.1.1.3 Temporary Employment Creation

Nature: **Temporary Employment Creation**
Impact Description: The construction phase of the proposed CCPP will generate temporary employment over an estimated three-year construction period. Based on information provided by the developer, approximately 300 direct jobs will be created on-site comprising construction workers, technical personnel and subcontractors (Mabasa Energy and Fuels, 2026, as cited in Urban-Econ, 2026). Due to the technical nature of the proposed project, the employment profile will be skewed toward skilled (40.1%) and semi-skilled (45.0%) labour with a smaller share of low-skilled opportunities (14.9%). In addition to direct employment, the Project is expected to support indirect and induced employment across the broader economy. These employment effects arise through supply chain linkages and increased household spending associated with construction activities. While a portion of specialised roles may be filled by workers sourced beyond the immediate area, the extent of local participation will depend on recruitment practices and the availability of required skills. Notwithstanding this, opportunities for local employment and income generation are expected, particularly in semi-skilled and support roles, where local labour is more likely to be competitively positioned since according to the socio-economic profile most of

***Nature:* Temporary Employment Creation**			
the residents are low-semiskilled. The impact is positive and significant in scale but inherently temporary with employment levels ceasing upon completion of construction.			
	Rating	**Motivation**	**Significance (S=(E+D+M) P**
Before Mitigation/Enhancement			
Duration	Short-term (2)	This impact is confined to the 3-year construction period therefore it is short term in nature.	**Medium Positive (60)**
Extent	National (4)	Employment opportunities likely to extend to those parts of the South African economy with the skills capacity to support large-scale power infrastructure developments such as the major metros and industrial hubs like Gauteng and eThekwini.	
Magnitude	Moderate (6)	While these opportunities will not resolve underlying structural unemployment challenges, they are expected to provide meaningful, albeit temporary, relief to unemployed and underemployed individuals in the region.	
Probability	Definite (5)	The impact is considered definite because the construction of the plant infrastructure will necessarily require labour inputs.	
Mitigation/Enhancement Measures			
Enhancement measures: • Prioritise local hiring as far as possible especially from nearby settlements within Richards Bay and in high-density settlements such as Empangeni and surrounding township areas. • Encourage use of local subcontractors and suppliers where feasible to improve indirect and induced employment.			
Post Mitigation/Enhancement Measures			
Duration	Short-term (2)	Unchanged as the enhancement measures do not influence this aspect of the impact.	**Medium Positive (60)**
Extent	National (4)	The extent remains national because the project will rely heavily on specialised skills and technical services that extend beyond the AOI.	
Magnitude	Moderate (6)	Unchanged as the enhancement measures improve local capture of employment benefits but not enough to materially shift labour market conditions at a wider local economy scale, especially against a high-unemployment baseline.	
Probability	Definite (5)	Unchanged as the enhancement measures do not influence this aspect of the impact	

13.21.1.1.4 Temporary increase in Household Income

Nature: Temporary increase in Household Income			
Impact Description: The capital investment is expected to generate a temporary increase in household income. This impact arises from increased wages and salaries paid to workers directly employed on the Project, as well as additional income generated indirectly through firms in the supply chain and induced effects as households spend part of their additional income in the local economy. The short-term increase in household income will therefore not only support immediate consumption needs but also generate wider multiplier effects as income accrues to households and circulates through local businesses and service providers. The SAM modelling results indicate that the domestic capital expenditure associated with the Project is projected to result in a total household income impact of approximately R4.4 billion across the South African economy. The spatial distribution of these gains will reflect the origin of contractors and workers. Prioritisation of local recruitment will ensure that households in Richards Bay and the CoU (where a substantial share of residents are middle to low-income earners) can benefit from temporary employment and income opportunities during the construction period.			
	Rating	**Motivation**	**Significance (S=(E+D+M) P**
Before Mitigation/Enhancement			**Medium Positive (60)**
Duration	Short-term (2)	This impact is confined to the 3-year construction period therefore it is short term in nature.	
Extent	National (4)	Since the procurement and employment effects will extend across local, regional and national economies the household income impact will mirror it as this production and employment is renumerated.	

Nature: Temporary increase in Household Income			
Magnitude	Moderate (6)	While this improvement will not resolve underlying structural poverty and household income challenges, they are expected to provide meaningful, albeit temporary, relief to households in the region.	
Probability	Definite (5)	The impact is considered definite because it arises directly from the project's capital expenditure. The resulting income effect is therefore expected to occur with certainty, provided the project proceeds.	
Mitigation/Enhancement Measures			
Enhancement measures: • Where feasible, prioritise local recruitment from communities in and around the CoU for suitable construction and support roles, to ensure a larger share of income accrues to local households.			
Post Mitigation/Enhancement Measures			
Duration	Short-term (2)	Unchanged as the enhancement measures do not influence this aspect of the impact.	**Medium Positive (60)**
Extent	National (4)	The extent remains national because the procurement and employment effects will extend beyond the AOI.	
Magnitude	Moderate (6)	Unchanged as the enhancement measures improve local capture of employment benefits but not enough to materially shift household income conditions at a wider local economy scale, especially against a low-income baseline.	
Probability	Definite (5)	Unchanged as the enhancement measures do not influence this aspect of the impact.	

13.21.1.1.5 Temporary increase in Tax Income

Nature: Temporary increase in Tax Income			
Impact Description: During the construction phase of the CCPP, tax revenues will be generated through several channels. The most immediate impact will be from value-added tax (VAT) on construction materials, equipment and services purchased for the development. Additionally, corporate income tax will be levied on the profits of construction firms and subcontractors involved in the project. Income tax will also be collected from the wages paid to the local labour force, contributing to the overall tax revenue. These tax benefits will be time-bound and associated primarily with the period of active construction.			
	Rating	**Motivation**	**Significance (S=(E+D+M) P)**
Before Mitigation/Enhancement			**Low positive (40)**
Duration	Short-term (2)	This impact is confined to the 3-year construction period therefore it is short term in nature.	
Extent	National (4)	The impact is rated at national scale as the tax benefits associated with CAPEX will accrue to the national fiscus rather than being confined to the local or regional economy.	
Magnitude	Minor (2)	The tax revenue generated through project CAPEX will contribute positively to the national fiscus, but the scale of this contribution is expected to be limited relative to total national tax revenues.	
Probability	Definite (5)	The impact is considered definite because it arises directly from the project's capital expenditure. The resulting tax effect is therefore expected to occur with certainty, provided the project proceeds.	
Mitigation/Enhancement Measures			
Enhancement measures: • Where feasible, prioritise local recruitment and procurement to reduce tax leakages out of the local economy.			
Post Mitigation/Enhancement Measures			
Duration	Short-term (2)	Unchanged as the enhancement measures do not influence this aspect of the impact.	**Medium Positive (40)**
Extent	National (4)	The extent remains national because the project expenditure will extend beyond the AOI.	

Magnitude	Minor (2)	Unchanged as enhancement measures not expected to increase the taxable expenditure associated with the project.	
Probability	Definite (5)	Unchanged as the enhancement measures do not influence this aspect of the impact.	

13.21.1.1.6 Temporary increase in noise, visual disruption and dust associated with construction activities

***Nature:* Temporary increase in noise, visual disruption and dust associated with construction activities**			
Impact Description: During the construction phase of the CCPP, there is expected to be an increase in noise, visual disruption and dust associated with construction activities. Dust generation from site preparation, excavation and the movement of materials can also temporarily reduce air quality in the immediate vicinity, affecting nearby land uses and potentially causing health impacts such as respiratory issues. These air quality concerns are further exacerbated by the wind-carrying dust beyond the construction site. Although the site's existing industrial context reduces the potential for severe visual disruptions there may experience a diminished visual experience as the industrial activities increase during this phase due to the presence of construction machinery, materials and temporary structures. However, these impacts are not expected to be significant due to the industrialised nature of the RBIDZ. This assessment is supported by the findings of the AIR undertaken by uMoya-NILU which states that, the increase in level of air pollution, noise pollution and negative visuals from the proposed development during construction are not expected to be major since the site is in a well-developed industrial area. Furthermore, the findings and recommendations of the Visual Impact Assessment also confirm that the visual impact will be low. The assessment is also supported by the Noise Study conducted by Enviro-Acoustic Research (2026) which states that there is low noise impact in the construction phase.			
	Rating	**Motivation**	**Significance (S=(E+D+M) P)**
Before Mitigation/Enhancement			
Duration	Short-term (2)	This impact is confined to the 3-year construction period therefore it is short term in nature.	**Low Negative (24)**
Extent	Local (2)	Only areas close to the site will be impacted.	
Magnitude	Low (4)	The increase in level of air pollution, noise pollution and negative visuals from the proposed development are not expected to be major since the site is in a well-developed industrial area.	
Probability	Probable (3)	There is a distinct likelihood that the impact could occur without mitigation.	
Mitigation Measures: • Apply dust suppression measures in active work areas especially during dry and windy conditions. • Apply Implement visual screening (e.g. hoarding, fencing, or temporary barriers) around active construction areas • Optimise site layout and material storage to reduce visual clutter • Maintain good housekeeping practices to minimise debris and disorder • Limit height and prominence of temporary structures where feasible • Use neutral colours for temporary infrastructure where practical			
Post Mitigation/Enhancement Measures			
Duration	Short-term (2)	Unchanged as the mitigation measures do not influence this aspect of the impact.	**Low Negative (18)**
Extent	Local (2)	Unchanged as the mitigation measures do not influence this aspect of the impact	
Magnitude	Minor (2)	Following mitigation, the significance is rated as low because the recommended measures are expected to substantially reduce the significance of the impact.	
Probability	Probable (3)	Unchanged as the mitigation measures do not influence this aspect of the impact.	

13.21.1.1.7 Short-term Traffic Congestion and associated disturbances

***Nature:* Short-term Traffic Congestion and associated disturbances**
Impact Description: During the construction phase, the proposed development is expected to result in temporary increases in traffic volumes within the area of influence. Construction activities will generate an increase in vehicle

***Nature:* Short-term Traffic Congestion and associated disturbances**			
movements, particularly heavy-duty trucks transporting materials and equipment to and from the site. This may place additional pressure on existing road infrastructure and contribute to short-term traffic congestion. Although the project is located within an established industrial zone that already experiences a relatively high volume of heavy vehicles, construction-related transport and associated activities (including road works, excavations, trenching and ancillary construction operations) are likely to generate periods of localised congestion and delays. These effects may result in short-term disruptions to traffic flow, restricted access and general inconvenience for businesses and road users in the vicinity along key construction routes. Given the short-term and temporary nature of the construction phase, traffic conditions are expected to return to normal once construction is complete and construction traffic ceases. The Updated Traffic Impact Assessment for Richards Bay Industrial Development Zone Phase 1F (2024), shows that some intersections exhibit high congestion levels during peak hours and others maintain acceptable traffic levels indicating sufficient capacity for current traffic volumes. Traffic congestion can also be reduced to an acceptable level through the implementation of appropriate traffic management measures, route planning and scheduling of heavy vehicle movements.			
	Rating	**Motivation**	**Significance (S=(E+D+M) P)**
Before Mitigation/Enhancement			
Duration	Short-term (2)	This impact is confined to the 3-year construction period therefore it is short term in nature.	**Medium Negative (40)**
Extent	Local (2)	Effects are confined to roads and access points in the immediate vicinity of the site.	
Magnitude	Moderate (6)	The impact is considered moderate as increased heavy vehicle movements may place additional pressure on roads in the Richards Bay area, where freight and industrial traffic already contribute to congestion and infrastructure strain.	
Probability	Highly Probable (4)	Highly probable as construction activities will require regular transport of materials and equipment. High probability of negative traffic impact from increased traffic volumes.	
Mitigation Measures: • Implement temporary traffic control measures where required at site access points and areas of excavation or trenching. • Maintain ongoing communication with affected businesses and stakeholders, providing advance notice of any road works, noise, lane closures or abnormal load movements.			
Post Mitigation/Enhancement Measures			
Duration	Short-term (2)	Unchanged as the mitigation measures do not influence this aspect of the impact.	**Medium Negative (32)**
Extent	Local (2)	Unchanged as the mitigation measures do not influence this aspect of the impact.	
Magnitude	Low (4)	Effective traffic management measures may reduce congestion and improve flow efficiency.	
Probability	Highly Probable (4)	Unchanged as the mitigation measures do not influence this aspect of the impact.	

13.21.1.1.8 Short-term influx of work seekers due to construction activities

***Nature:* Short-term influx of work seekers due to construction activities**
Impact Description: Large-scale developments such as the proposed Project are typically associated with expanded employment opportunities, which can, in turn, influence local demographic dynamics. In the case of the proposed development, a degree of in-migration of work seekers to the project area is anticipated, including individuals originating from outside the host municipality. These individuals are likely to be attracted by the prospect of temporary construction employment as well as ancillary informal economic activities, such as informal trading in proximity to the site and along key transport routes. If not appropriately managed, even a moderate influx of job seekers may give rise to a range of secondary socio-economic impacts. These may include increased competition for a limited number of employment opportunities, potential dissatisfaction or unrest where recruitment processes are perceived to lack transparency or fairness and an elevated risk of opportunistic crime, petty theft and conflict associated with informal trading activities. In addition, a transient or semi-permanent population increase may exert pressure on existing local services and infrastructure, including public transport systems, healthcare facilities and waste management services. There may also be

Nature: **Short-term influx of work seekers due to construction activities**			
associated public health considerations, such as an increased risk of communicable diseases, as well as alcohol- and substance-related incidents. Overall, while the proposed development may result in some short-term demographic and social pressures, these effects are expected to be moderate and manageable and broadly commensurate with the scale and duration of construction-related employment opportunities. The increase in population numbers must be mitigated to avoid a situation where there is added pressure on limited resources.			
	Rating	**Motivation**	**Significance (S=(E+D+M) P**
Before Mitigation/Enhancement			
Duration	Short-term (2)	This impact is confined to the 3-year construction period therefore it is short term in nature.	**Low Negative (24)**
Extent	Local (2)	Effects are concentrated within the project area and surrounding communities, including nearby settlements and service nodes.	
Magnitude	Low (4)	The anticipated influx is expected to be low relative to project scale but may still create localised social and service pressures if unmanaged.	
Probability	Probable (3)	Large construction projects typically attract work seekers making some level of in-migration likely.	
Mitigation/Enhancement Measures			
Mitigation measures: • Prioritise local recruitment where feasible to limit unnecessary in-migration • Engage regularly with local communities and stakeholders to communicate employment opportunities and requirements • Enforce access control at the site to discourage unauthorised job-seeking presence • Implement a transparent and well-communicated recruitment process to manage expectations and reduce perceptions of unfairness			
Post Mitigation/Enhancement Measures			
Duration	Short-term (2)	Unchanged as the mitigation measures do not influence this aspect of the impact.	**Low Negative (18)**
Extent	Local (2)	Unchanged as the mitigation measures do not influence this aspect of the impact.	
Magnitude	Minor (2)	The anticipated influx after mitigations is expected to be minor if effectively managed.	
Probability	Probable (3)	Unchanged as the mitigation measures do not influence this aspect of the impact.	

13.21.1.2 Operational Phase

The following impacts have been identified as likely to arise during the operational phase of the proposed CCPP.

13.21.1.2.1 Sustained Increase in Production

Nature: **Sustained increase in Production**			
Impact Description: During the operational phase, the proposed development will generate a sustained increase in economic production over an estimated 25-year lifespan. Ongoing expenditure on operations and maintenance (O&M) will support continuous business activity, resulting in increased output (production) within the South African economy. Based on the SAM modelling, total production impacts of approximately R1.42 billion per annum are anticipated, reflecting direct output from firms contracted to operate and maintain the facility, as well as indirect and induced effects across the supply chain. While the CoU and the Richards Bay area will benefit from on-site operations and local service provision, a significant share of specialised maintenance, engineering and professional services is likely to be sourced from established industrial and service hubs elsewhere in the country. As such, the production benefits will extend beyond the immediate locality to the broader national economy. It is also important to note that LNG fuel inputs are expected to be fully imported and are therefore treated as economic leakage, limiting the extent of domestic production gains. Nevertheless, the operational-phase impact is positive and recurring over the long term, contributing to sustained economic activity, supply chain linkages and overall economic output throughout the plant's lifespan.			
	Rating	**Motivation**	**Significance**

***Nature:* Sustained increase in Production**			
			(S=(E+D+M) P
Before Mitigation/Enhancement			
Duration	Long-term (4)	Impact persists over the full operational life of the plant (±25 years), reflecting continuous O&M expenditure.	**Medium Positive (50)**
Extent	National (4)	Benefits will likely be distributed across national supply chains, including regional and major industrial hubs where specialised services are located. As such, the production benefits will extend beyond the immediate locality to the broader national economy.	
Magnitude	Minor (2)	Although production is sustained, the domestic impact is moderated by reliance on imported LNG.	
Probability	Definite (5)	The impact is considered definite because it arises directly from the project's operational expenditure. The resulting production effect is therefore expected to occur with certainty over the plant's lifespan.	
Mitigation/Enhancement Measures			
Enhancement Measures: • Maximise local procurement for O&M where feasible to strengthen regional production linkages • Support development of local supplier capacity to capture a greater share of O&M expenditure			
Post Mitigation/Enhancement Measures			
Duration	Long-term (4)	Unchanged as the enhancement measures do not influence this aspect of the impact.	**Medium Positive (50)**
Extent	National (4)	The extent remains national because the project will rely heavily on specialised inputs, technical services and supply chains that extend beyond the AOI.	
Magnitude	Minor (2)	Unchanged as a substantial portion of operational expenditure is expected to be associated with LNG imports, meaning that much of the expenditure will not circulate meaningfully within the local or domestic economy.	
Probability	Definite (5)	Unchanged as the enhancement measures do not influence this aspect of the impact.	

13.21.1.2.2 Sustained Increase in GDP

***Nature:* Sustained increase in GDP**			
Impact Description: During the operational phase, the proposed development will generate a sustained increase in GDP over its estimated 25-year lifespan. Ongoing O&M expenditure will support continuous economic activity with SAM modelling indicating a total GDP impact of approximately R613.61 million per annum. This includes direct value added from firms operating and maintaining the facility, as well as indirect and induced effects across the supply chain and through household spending. While a portion of these benefits will accrue locally within the CoU, a significant share will flow to regional and national economic centres where specialised engineering, technical and professional services are based. The extent of local benefit can be enhanced through targeted localisation of O&M activities, supplier development and skills programmes, particularly where these support the inclusion of small and emerging enterprises within the area of influence.			
	Rating	**Motivation**	**Significance (S=(E+D+M) P**
Before Mitigation/Enhancement			
Duration	Long-term (4)	Impact persists over the full operational life of the plant (±25 years), reflecting a sustained increase in GDP.	**Medium Positive (50)**
Extent	National (4)	Although a portion of benefits will accrue locally within the CoU, most of the GDP effects will extend to regional and national economic centres through procurement of specialised engineering, technical and professional services.	
Magnitude	Minor (2)	While the absolute GDP contribution is material in project terms, it remains small relative to the overall size of the local, provincial and national economies, indicating a minor macroeconomic effect.	
Probability	Definite (5)	The impact is considered definite because it arises directly from the project's operational expenditure. The resulting GDP effect is therefore expected to occur with certainty over the plant's lifespan.	
Mitigation/Enhancement Measures			
Enhancement Measures:			

***Nature:* Sustained increase in GDP**			
• Prioritise inclusion of SMMEs in O&M contracting where commercially viable. • Maximise local procurement and value retention within the host municipality where feasible.			
Post Mitigation/Enhancement Measures			
Duration	Long-term (4)	Unchanged as the enhancement measures do not influence this aspect of the impact.	**Medium Positive (60)**
Extent	National (4)	The extent remains national because the project will rely heavily on specialised inputs, technical services and supply chains that extend beyond the AOI.	
Magnitude	Low (4)	The magnitude increases from minor to low due to enhanced local participation in O&M activities, improved SMME inclusion and increased local multiplier effects, resulting in stronger local economic spillovers and value retention.	
Probability	Definite (5)	Unchanged as the enhancement measures do not influence this aspect of the impact.	

13.21.1.2.3 Sustained Employment Opportunities

***Nature:* Sustained employment opportunities**			
Impact Description: During the operational phase, the proposed development will support sustained employment over an estimated 25-year lifespan. Direct employment will comprise 54.2% skilled, 37.9% semi-skilled and 7.9% unskilled. Indirect employment will arise in sectors supplying goods and services to the facility, while induced employment will result from expenditure by workers in the broader economy. According to the project information provided by Mabasa Energy and Fuels (Pty) Ltd (2024) (as cited in Urban-Econ, 2026), during the commissioning and operational phases, approximately 50 local personnel will be employed and provided with hands-on training in power plant operations and maintenance. Throughout the 25 years, it is projected that around 300 highly trained operations and maintenance professionals will graduate from the on-site training programme facilitated by Mabasa Energy (Mabasa Energy and Fuels (Pty) Ltd, 2024, as cited in Urban-Econ, 2026). Due to the specialised nature of combined-cycle gas plant operations, a portion of employment is likely to be sourced from established industrial and service centres outside the AOI. Nonetheless, the CoU and surrounding region will benefit from some stable, long-term employment opportunities and associated income flows. The impact is therefore positive, sustained and partially localised, with scope to enhance local employment outcomes through targeted skills development and localisation initiatives.			
	Rating	**Motivation**	**Significance (S=(E+D+M) P**
Before Mitigation/Enhancement:			
Duration	Long-term (4)	Impact persists over the full operational life of the plant (±25 years), reflecting a sustained increase in employment generation.	**Medium Positive (50)**
Extent	National (4)	A portion of employment is likely to be sourced from established industrial and service centres outside the AOI due to the highly specialised nature of plant operations.	
Magnitude	Minor (2)	Operational job creation is expected to be limited in scale, with only a relatively small number of direct jobs likely to be generated during the operational phase. In addition, some of the required skills and services may need to be sourced from established industrial and service centres outside the AOI, which will further limit the extent of local employment benefit.	
Probability	Definite (5)	Impact is considered definite because the operation of the facility will necessarily require labour inputs for plant operation, maintenance and support functions.	
Mitigation/Enhancement Measures			
Enhancement Measures: • Prioritise local hiring as far as possible especially from nearby settlements within Richards Bay and in high-density settlements such as Empangeni and surrounding township areas. • Encourage use of local subcontractors and suppliers where feasible to improve indirect and induced employment.			
Post Mitigation/Enhancement Measures			
Duration	Long-term (4)	Unchanged as the enhancement measures do not influence this aspect of the impact.	**Medium Positive (50)**

Nature: Sustained employment opportunities			
Extent	National (4)	The extent remains national because the project will rely heavily on specialised skills and technical services that extend beyond the AOI.	
Magnitude	Minor (2)	Unchanged as the enhancement measures improve local capture of employment benefits but not enough to materially shift labour market conditions at a wider local economy scale, especially against a high-unemployment baseline.	
Probability	Definite (5)	Unchanged as the enhancement measures do not influence this aspect of the impact.	

13.21.1.2.4 Increase in Household Income

Nature: Increase in Household Income			
Impact Description: During the operational phase, the proposed development will generate a sustained increase in household income over its estimated 25-year lifespan. Based on the OPEX modelling, total income impacts of approximately R260.95 million per annum are expected to be supported across the economy. This includes direct income earned by employees at the Plant, as well as indirect and induced income generated through supply chain activities and additional household spending. Direct income will accrue to workers employed at the facility, while indirect income will benefit employees of firms providing goods and services to the plant. Induced income effects will arise as increased earnings are spent within the economy, supporting further economic activity. As with other economic impacts, a portion of these income benefits will accrue outside the immediate project area due to the specialised nature of services required. However, local households within the CoU will benefit from stable, long-term income opportunities associated with direct employment and supporting services. The impact is therefore positive, recurring and distributed across local, regional and national economies, with potential for greater local retention through targeted localisation and skills development initiatives.			
	Rating	**Motivation**	**Significance (S=(E+D+M) P**
Before Mitigation/Enhancement			**Medium Positive (60)**
Duration	Long-term (4)	Impact persists over the full operational life of the plant (±25 years), reflecting a sustained increase in household income.	
Extent	National (4)	Income benefits are distributed across local, regional and national economies in line with employment and supply chain linkages.	
Magnitude	Low (4)	Annual income impact is meaningful but moderated by the likely high levels of external sourcing of labour and procurement.	
Probability	Definite (5)	The impact is considered definite because it arises directly from the project's operational expenditure. The resulting income effect is therefore expected to occur with certainty over the plant's lifespan.	
Mitigation/Enhancement Measures			
Enhancement Measures: • As far as possible, prioritise local recruitment with clear targets for hiring residents from the CoU and surrounding areas where possible so that a larger share of income accrues to local households.			
Post Mitigation/Enhancement Measures			
Duration	Long-term (4)	Unchanged as the enhancement measures do not influence this aspect of the impact.	**Medium Positive (60)**
Extent	National (4)	The extent remains national because the procurement and employment effects will extend beyond the AOI.	
Magnitude	Low (4)	Unchanged as the enhancement measures improve local capture of employment benefits but not enough to materially shift household income conditions at a wider local economy scale, especially against a low-income baseline and the limited direct employment opportunities.	
Probability	Definite (5)	Unchanged as the enhancement measures do not influence this aspect of the impact.	

13.21.1.2.5 Increased Electricity Generation

***Nature:* Increased electricity generation**			
Impact Description: The proposed Plant is expected to add a block of dispatchable generation capacity to the national grid. In principle, this additional capacity can contribute to a more stable and reliable electricity supply, particularly during periods of high demand and can help to reduce the frequency and severity of load shedding. In the CoU, where manufacturing accounts for roughly 40.7% of GVA, reliable electricity is a critical input into production. According to IGUA-SA, industries in Richards Bay and Empangeni currently face recurring constraints stemming from limited gas availability, ageing infrastructure and unstable supply from upstream networks (IGUA-SA, 2024 as cited in Urban-Econ, 2026). In this context, the CCPP can play an important role in supporting energy-intensive manufacturing and logistics activities, limiting production losses due to power interruptions and providing a more predictable environment for investment and operations. However, the actual scale of the benefit will depend on how the proposed Plant is integrated and operated within the broader power system. If high gas prices or grid constraints limit its utilisation, the improvement in security of supply may be smaller than the installed capacity suggests. Additionally, as a gas-fired plant, the CCPP will add to South Africa's fossil fuel generation portfolio which will need to be managed within the country's long-term energy transition and emissions-reduction commitments. While gas is often positioned as a "transition fuel", long-term reliance on imported LNG could expose the system to fuel price volatility, foreign exchange risk and future carbon-policy constraints. On balance, the impact of the CCPP on energy security and regional production capacity is assessed as positive but conditional. It can make a meaningful contribution to system reliability and industrial performance, particularly in a manufacturing-heavy region such as uMhlathuze, but the scale of this benefit will depend on how it is dispatched and how fuel and transition risks are managed.			
	Rating	**Motivation**	**Significance (S=(E+D+M) P**
Before Mitigation/Enhancement			
Duration	Long-term (4)	Impact persists over the full operational life of the plant (±25 years) through sustained electricity generation.	**High Positive (80)**
Extent	National (4)	Additional generation capacity contributes to the national grid, with benefits extending across regions connected to the system.	
Magnitude	High (8)	The addition of 750 MW of dispatchable capacity provides a meaningful contribution to grid stability and supports energy-intensive industries.	
Probability	Definite (5)	The plant will generate electricity as part of normal operations, although the extent of system benefit depends on dispatch and fuel conditions.	
Mitigation/Enhancement Measures			
Enhancement: • Optimise plant dispatch and integration with the grid to prioritise operation during peak demand periods and system constraints, thereby maximising its contribution to energy security and reliability.			
Post Mitigation/Enhancement Measures			
Duration	Long-term (4)	Unchanged as the enhancement measures do not influence this aspect of the impact.	**High Positive (80)**
Extent	National (4)	Unchanged as the enhancement measures do not influence this aspect of the impact.	
Magnitude	High (8)	While enhancement measures improve system integration and operational efficiency, the scale of the benefit cannot be significantly increased beyond a certain threshold by the enhancement measures.	
Probability	Definite (5)	Unchanged as the enhancement measures do not influence this aspect of the impact.	

13.21.1.2.6 Operational Noise Impact

***Nature*: Operational Noise Impact**
During operation, the proposed Plant will generate continuous mechanical and process noise from turbines, generators, cooling systems, transformers and ancillary equipment. According to the Noise Study conducted by Enviro-Acoustic Research (2026) Plant noise may increase general annoyance levels, particularly at night or in locations where several noisy activities occur simultaneously. However, because the plant is located in an already noisy

***Nature*: Operational Noise Impact**			
industrial environment and residential areas lie further away, material impacts on community amenity in residential neighbourhoods are not expected, provided that plant noise is kept within licensed limits. According to the Noise Study conducted by Enviro-Acoustic Research (2026), ambient sound levels in the area are generally elevated and often exceed typical thresholds for residential environments, largely due to the concentration of industrial operations and transport activities associated with the Port of Richards Bay and the RBIDZ. Within this context, the addition of noise from a new plant is unlikely to result in a clearly perceptible increase in overall ambient noise levels, provided that appropriate design measures and operational controls are implemented. Accordingly, operational noise impacts are expected to be localised in extent and of low significance, largely confined to the industrial area and not materially affecting the broader surrounding community.			
	Rating	**Motivation**	**Significance (S=(E+D+M) P)**
Before Mitigation/Enhancement			
Duration	Long-term (4)	Noise is a continuous by-product of plant operations and will persist throughout the ±25-year operational lifespan.	**Low Negative (24)**
Extent	Local (2)	Noise effects are largely confined to the immediate industrial area, with limited propagation to distant residential receptors due to separation distance and existing background noise levels.	
Magnitude	Minor (2)	Incremental noise from the plant is small relative to already elevated ambient noise levels in the industrial zone, resulting in limited perceptible change.	
Probability	Probable (3)	There is some possibility, but with low likelihood	
Mitigation/Enhancement Measures			
Mitigation: • Incorporate noise control measures in the plant design. • Design and operate the plant to comply with applicable noise guidelines.			
Post Mitigation/Enhancement Measures			
Duration	Long-term (4)	Unchanged as the mitigation measures do not influence this aspect of the impact.	**Low Negative (24)**
Extent	Local (2)	Unchanged as the mitigation measures do not influence this aspect of the impact.	
Magnitude	Minor (2)	Unchanged as mitigation measure may reduce noise emissions but the relative change to ambient conditions remains marginal and cannot eliminate operational noise.	
Probability	Probable (3)	Unchanged as the mitigation measures do not influence this aspect of the impact.	

13.21.1.2.7 Accidental gas release, fire or explosion risk during operation

***Nature*: Accidental gas release, fire or explosion risk during operation**			
During the operational phase an unintended gas release could occur due to equipment failure, corrosion, human error, poor maintenance or third-party interference. Although such events are generally low probability, they are high consequence. Given that the immediate surrounding land use is predominantly industrial and commercial the principal socio-economic receptors are therefore workers, businesses, logistics operations and industrial assets, rather than sensitive residential receptors. In this context, the most material socio-economic consequences would relate to occupational health and safety (injury or fatality risk), temporary shutdown of plant operations and adjacent businesses, access restrictions within the industrial precinct, disruption to supply chains and freight movement and direct and indirect financial losses. Even where physical impacts are contained within an industrial footprint, a major incident can create broader economic and reputational effects by reducing confidence in the precinct's safety, affecting investor perceptions and placing short-term pressure on local emergency and health services.			
	Rating	**Motivation**	**Significance (S=(E+D+M) P)**
Before Mitigation/Enhancement			
Duration	Long-term (4)	The risk persists for the entire operational lifespan of the plant (±25 years).	**Low Negative (14)**
Extent	Site (1)	Potential impacts would be largely contained within the plant footprint and immediate industrial surroundings.	
Magnitude	Minor (2)	While consequence severity can be high in the event of an incident, the *expected magnitude* is rated low due to the very low likelihood of occurrence and containment within an industrial setting with limited sensitive receptors.	

***Nature*: Accidental gas release, fire or explosion risk during operation**			
Probability	Improbable (2)	Accidental releases, fires or explosions are low-probability events under standard operating conditions, particularly where modern plant design and safety protocols are applied.	
Mitigation/Enhancement Measures			
Mitigation: • Ensure robust early detection and rapid response systems are in place to enhance preparedness. • Maintain exclusion zones and controlled access around high-risk infrastructure.			
Post Mitigation/Enhancement Measures			
Duration	Long-term (4)	Unchanged as the mitigation measures do not influence this aspect of the impact.	**Low Negative (14)**
Extent	Site (1)	With improved controls, any incident is expected to remain confined to the site or immediate industrial area, with minimal off-site effects.	
Magnitude	Minor (2)	Unchanged as enhanced safety systems, monitoring and response protocols reduce the potential scale and consequences of an incident, but residual risk remains inherent to gas-based operations.	
Probability	Improbable (2)	Unchanged as the mitigation measures do not influence this aspect of the impact.	

13.21.1.2.8 Degradation of Air Quality

***Nature*: Degradation of Air Quality**			
Impact Description: Degradation of air-quality will arise from the combustion of natural gas, which releases a mix of pollutants into the atmosphere. Although gas is cleaner than coal and heavy fuel oil, the plant will still emit nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOCs) and, to a lesser extent, sulphur dioxide (SO_2) and particulate matter (PM). Given the long-term nature of plant operations and the cumulative effect of emissions in an already industrialised airshed, the AIR (uMoya-NILU, 2026) shows a risk of localised worsening of air quality, particularly in relation to NO_2. Under unmitigated conditions, modelled NO_x levels could exceed legal air-quality limits just beyond the site boundary, especially during start-up events and in parts of the industrial area that are most often downwind of the plant (Belelie, *et al*, 2019 as cited in Urban-Econ, 2026). In addition, climate change and environmental degradation act as "threat multipliers" in coastal contexts, where declining air quality and broader ecological stressors can indirectly undermine food availability, affordability and nutritional outcomes, particularly for fisheries-dependent and low-income households. Fisheries-dependent and low-income households are particularly affected as declining marine ecosystem health reduces fish stocks and catches, while rising costs and reduced availability of affordable protein sources further strain already limited household incomes and food security. From a socio-economic and health perspective, this matters because elevated NO_2 levels can irritate the lungs and worsen existing respiratory conditions, such as asthma or chronic bronchitis. Small-scale and subsistence fishers in and around the Port of Richards Bay are particularly vulnerable, as cumulative exposure to air pollution can compromise their respiratory health and reduce their capacity to work, while interacting environmental stressors linked to climate change further threaten fish stocks, thereby undermining both their livelihoods and the affordability and availability of a key food source. The AIR (uMoya-NILU, 2026) states that, the increase in level of air pollution from the proposed development during operation are not expected to be major since the site is in a well-developed industrial area .The AIR indicates that concentrations of CO, VOCs, SO_2 and PM are expected to remain within guideline values and that residential areas, schools and medical facilities are unlikely to experience material deterioration in air quality as a result of the plant (uMoya-NILU, 2026). Therefore, the people most likely to be affected are not the general public in distant suburbs, but those who spend long periods in the industrial area for example, employees at nearby plants and other workers who are exposed repeatedly over time. It is therefore more of a localised nuisance and occupational issue than a community-wide health concern. Overall, in an already industrialised airshed, the operational emissions from the CCPP are expected to have a negative but generally low to moderate socio-economic impact, concentrated mainly on workers and businesses within the industrial area rather than on surrounding residential communities. The significance of this impact is strongly dependent on how effectively emission controls, operational practices and ongoing compliance monitoring are implemented over the life of the plant. If these are well managed, air-quality and health risks should remain moderate and manageable.			
	Rating	**Motivation**	**Significance (S=(E+D+M) P)**
Before Mitigation/Enhancement			

***Nature*: Degradation of Air Quality**			
Duration	Long-term (4)	The impact persists for the entire operational lifespan of the plant (±25 years).	**Medium Negative (52)**
Extent	Regional (3)	Impact contributes to a broader regional industrial airshed affecting nearby receptors.	
Magnitude	Moderate (6)	Direct impacts occur locally but contribute to a broader industrial airshed affecting nearby receptors.	
Probability	Highly Probable (4)	Emissions will occur as an inherent result of plant operation.	
Mitigation/Enhancement Measures			
Mitigation: • Implement advanced emission control technologies (e.g. low-NOx burners, high-efficiency turbines). • Install and maintain Continuous Emissions Monitoring Systems. • Ensure strict compliance with NAAQS and emission standards. • Optimise operational efficiency to minimise fuel use and emissions intensity.			
Post Mitigation/Enhancement Measures			
Duration	Long-term (4)	Unchanged as the mitigation measures do not influence this aspect of the impact.	**Medium Negative (44)**
Extent	Regional (3)	Unchanged as the mitigation measures do not influence this aspect of the impact.	
Magnitude	Low (4)	Emissions reduced to within regulatory limits and managed effectively with mitigation.	
Probability	Highly Probable (4)	Unchanged as the mitigation measures do not influence this aspect of the impact.	

13.21.1.3 Decommissioning Phase

In the event of a partial or total decommissioning of the CCPP the following associated socioeconomic impacts are likely to arise.

13.21.1.3.1 Increased Waste Generation and Disposal Risks

Nature: Increased Waste Generation and Disposal Risks			
Impact Description: During the decommissioning phase, the dismantling and removal of plant infrastructure will generate substantial volumes of waste, including scrap metal, construction debris and potentially hazardous materials such as oils, lubricants and chemical residues. These materials will require appropriate handling, storage, transport and disposal in accordance with applicable regulations. If not effectively managed, these activities may pose environmental and health risks, including soil and water contamination, exposure to hazardous substances and improper disposal practices. In addition, the scale of waste generated may place temporary pressure on local and regional waste management infrastructure, particularly licensed hazardous waste facilities. Notwithstanding these risks, a significant proportion of materials, particularly metals, can be recovered and recycled, reducing the volume of waste sent to landfill and generating secondary economic value. The overall impact is therefore negative but short-term and manageable with appropriate waste management planning and regulatory compliance.			
	Rating	**Motivation**	**Significance (S=(E+D+M) P)**
Before Mitigation/Enhancement			
Duration	Very Short term (1)	Impact is limited to the decommissioning period.	**Medium Negative (36)**
Extent	Local (2)	Effects occur at the site and along transport routes to disposal or recycling facilities.	
Magnitude	Moderate (6)	High volumes of waste and presence of hazardous materials present meaningful environmental and handling risks.	
Probability	Highly Probable (4)	Waste generation is inevitable during decommissioning activities, but the scale and composition of that waste may change over time as future technologies, material recovery systems and waste management practices evolve.	
Mitigation/Enhancement Measures			
Mitigation: • Develop and implement a comprehensive Waste Management Plan. • Segregate hazardous and non-hazardous waste at source.			

Nature: Increased Waste Generation and Disposal Risks			
• Maximise recycling and recovery of materials of decommissioned components to maximise economic value recovery and reduce environmental and social impacts associated with disposal. • Use licensed contractors for transport and disposal of hazardous waste. • Ensure compliance with all waste management regulations and standards. • Monitor waste handling and disposal practices throughout decommissioning.			
Post Mitigation/Enhancement Measures			
Duration	Very Short term (1))	Unchanged as the mitigation measures do not influence this aspect of the impact.	**Low Negative (28)**
Extent	Local (2)	Unchanged as the mitigation measures do not influence this aspect of the impact.	
Magnitude	Low (4)	Effective waste management, recycling and compliance measures reduce risks and impacts from moderate to low.	
Probability	Highly Probable (4)	Unchanged as the mitigation measures do not influence this aspect of the impact.	

13.21.1.3.2 Short-Term Increases in Employment and Local Spending Associated with Decommissioning Works

Nature: Short-Term Increases in Employment and Local Spending Associated with Decommissioning Works			
Impact Description: Decommissioning activities would require a specialised decommissioning workforce, generating temporary employment across skill levels. Additional indirect employment would arise in firms supplying equipment, transport, waste management and other services, with further induced benefits through local spending by workers. Because of the nature of the equipment and materials used in gas to power plants, there is need for specialised skills and equipment to demolish a gas to power plant. Many of the decommissioning contracts may therefore be awarded to firms outside the immediate area, the geographic distribution of these benefits would therefore extend beyond the CoU, but there would nonetheless be a short-term economic uplift for those workers and businesses directly involved.			
	Rating	**Motivation**	**Significance (S=(E+D+M) P)**
Before Mitigation/Enhancement			
Duration	Very Short term (1)	Impact is limited to the decommissioning period.	**Medium Positive (55)**
Extent	National (4)	Procurement and employment opportunities likely to extend to those parts of the South African economy with the skills capacity to support decommissioning activities such as the major metros and industrial hubs like Gauteng and eThekwini.	
Magnitude	Moderate (6)	The impact magnitude within the AOI will therefore be limited by the spatial distribution of the impact.	
Probability	Definite (5)	The impact is considered definite because the decommissioning of the plant infrastructure will necessarily require labour inputs and expenditure.	
Mitigation/Enhancement Measures			
Enhancement: • Prioritise local procurement both directly as well as for support services.			
Post Mitigation/Enhancement Measures			
Duration	Very short-term (1)	Unchanged as the enhancement measures do not influence this aspect of the impact.	**Medium Positive (55)**
Extent	National (4)	The extent remains national because the project will rely heavily on specialised skills and technical services that extend beyond the AOI.	
Magnitude	Moderate (6)	Unchanged as the enhancement measures improve local capture of employment benefits but not enough to materially shift labour market conditions at a wider local economy scale.	
Probability	Definite (5)	Unchanged as the enhancement measures do not influence this aspect of the impact.	

13.21.1.3.3 Cessation of energy supply, employment and associated economic benefits

***Nature:* Cessation of energy supply, employment and associated economic benefits**			
Impact Description: Decommissioning would result in the cessation of the Plant's operational benefits. Firstly, all direct operational employment opportunities would fall away, together with associated indirect and induced employment supported through operations and maintenance expenditure. While operational employment at such facilities is typically limited relative to construction, these jobs are more stable and longer-term in nature. Their loss therefore remains important, particularly in a context of constrained formal employment opportunities and continued socio-economic pressure within the broader area. Secondly, the energy supply benefit associated with the facility would cease. Once decommissioned, the Plant would no longer contribute to electricity generation, energy security, or supply diversification. This is significant in a context where reliable energy availability remains important for economic activity, industrial operations, and broader development outcomes. Thirdly, the GDP, production, and household income benefits linked to ongoing operational expenditure would also come to an end. The Plant would no longer generate continued demand for inputs, services, and supporting economic activity during its operational phase. As a result, the positive production and income effects sustained through OPEX would no longer accrue.			
	Rating	**Motivation**	**Significance (S=(E+D+M) P)**
Before Mitigation/Enhancement			
Duration	Permanent (5)	The loss of employment, income streams and energy contribution is irreversible once operations cease.	**High Negative (85)**
Extent	National (4)	Effects are distributed across local, regional and national economies due to supply chain linkages and the plant's role in the broader national electricity system.	
Magnitude	High (8)	The cessation of a large-scale, long-operating facility results in a substantial loss of direct, indirect and induced economic activity, including jobs, income and production.	
Probability	Definite (5)	The impact is inevitable, as plant closure will definitively result in the termination of operational activities and associated economic benefits.	
Mitigation/Enhancement Measures			
Mitigation: • Re-use of the site in line with its industrial zoning so that existing infrastructure can anchor new investment and employment opportunities. • Workforce transition measures, such as retraining, redeployment within the company or assistance to access new employment, to reduce the negative impact on workers employed at the plant.			
Post Mitigation/Enhancement Measures			
Duration	Permanent (5)	Unchanged as the enhancement measures do not influence this aspect of the impact.	**High Negative (75)**
Extent	National (4)	Unchanged as the enhancement measures do not influence this aspect of the impact.	
Magnitude	Moderate (6)	Reduced through site re-use and workforce transition measures, which partially offset job losses and support new economic activity, but do not fully replace the scale of lost benefits.	
Probability	Definite (5)	Unchanged as the enhancement measures do not influence this aspect of the impact.	

13.22 Social Environment

The outcomes of the Social Impact Assessment (Nemai Consulting, 2025) are presented below. The specialist report is contained in **Appendix E12**.

13.22.1 *Impact Assessment*

13.22.1.1 *Pre-Construction & Construction Phases*

Environmental Feature		Planning Impacts				
Project Phase:		Pre- construction Phase				
Potential Impact		Proposed Management Objectives / Mitigation Measures				
Attitude formation & Compliance with Municipal by laws		• Early consultation between the project authorities, adjacent landowners, tenants and other relevant stakeholders must take place to allow sufficient time before construction activity commences. • Public declaration outlining their governance frameworks and ethical values. • Clear, competitive bidding procedures should be used for contracting and procurement in order to avoid inappropriate influence.				
Local Empowerment and Inclusivity		• Avoid overstating economic benefits. • Provide a transparent job assessment. • Prioritise local hiring for project-related jobs. Create specific programmes to train and upskill local residents. • Encourage local businesses to participate in the project by sourcing equipment, materials, and services locally. • Make provisions for a Community Liaison Officer.				
Compliance with Municipal By-Laws		• Conduct a legal and regulatory compliance assessment to identify all applicable municipal by-laws.				
	Nature	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	Negative	Local	Medium	Short Term	Likely	2
After Mitigation	Negative	Local	Low	Short Term	Moderate	1

Environmental Feature	Construction Impacts
Project Phase:	Construction Phase
Potential Impact	Proposed Management Objectives / Mitigation Measures
Local Business and employment opportunities	• Establish a local hiring policy to prioritise the employment of residents. • Collaborate with local training institutions to develop skills training programmes to prepare local workers for available positions. • Monitor and report on the number of local residents employed to ensure targets are being met.
Job Seeker Influx	• Develop and implement transparent communication channels between the project team and the community about local hiring processes. • Establish a skilled and unskilled database for unemployed residents to ensure that locals are prioritised.
Local Empowerment and Inclusivity	• Prioritise local hiring for project-related jobs. Create specific programs to train and upskill local residents • Encourage local businesses to participate in the project by sourcing equipment, materials, and services locally. • Make provisions for a Community Liaison Officer • Establish a Project Steering Committee
Noise and Dust Pollution	• Ensure that environmental management plan includes health risk monitoring. • Use temporary windbreakers and dust suppression techniques such as water spraying. • Limit construction activities to specific hours of the day to minimize disturbances for the nearby community. • Install noise barriers and use low-noise equipment where possible.
Traffic flows	• Identify and use specific routes for transporting equipment to avoid high-traffic areas and sensitive zones. • Install clear warning signs, speed limit indicators, and road safety measures to alert pedestrians and drivers of construction-related traffic if required. • Inform the community/local businesses in advance about construction schedules and potential traffic disruptions.

Environmental Feature		Construction Impacts				
Project Phase:		Construction Phase				
Potential Impact		Proposed Management Objectives / Mitigation Measures				
Security Concerns		• Hire security personnel to monitor the construction site and surrounding areas. • Install surveillance systems to discourage theft and vandalism. • Conduct regular security audits to identify and address potential vulnerabilities.				
Construction Waste		• Develop a waste management plan. • Establish regular waste collection and disposal schedules. • Promote recycling initiatives to minimise waste.				
	Nature	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	Negative	Local	Medium	Short Term	Likely	2
After Mitigation	Negative	Local	Low	Short Term	Moderate	1

13.22.1.2 Operational Phase

Environmental Feature		Operational Impacts				
Project Phase:		Operation Phase				
Potential Impact		Proposed Management Objectives / Mitigation Measures				
Local Economy Development		• Prioritise hiring residents from the local community (Ward 2) and for general labour positions, such as cleaning services, landscaping, and maintenance. This will create job opportunities and boost the local economy. • Seek service providers within the local and regional area of the project.				
Improved Energy supply		• Implement regular infrastructure maintenance to prevent power outages and ensure consistent service delivery.				
Security Concerns		• Ensure that all pedestrian walkways, entrances, and public spaces are equipped with adequate lighting to eliminate dark or hidden areas that could encourage criminal activities. • Prioritise hiring security staff from the local community. This not only creates job opportunities but also fosters trust and familiarity between security personnel and residents, enhancing the sense of safety.				
	Nature	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	Negative	Local	Medium	Short Term	Likely	2
After Mitigation	Negative	Local	Low	Short Term	Moderate	1

13.23 Traffic

13.23.1 Impact Description

There will be an increase in construction-related traffic associated with the transport of personnel, equipment, construction materials, abnormal loads and waste.

The Project could cause the following traffic-related impacts during the construction phase:

- ❑ Increased traffic volumes on local and regional roads, particularly Alumina Allee Road and access routes servicing the RBIDZ.

- Increased interaction between construction vehicles, heavy goods vehicles and existing road users, potentially increasing the risk of traffic accidents and road safety incidents.
- Temporary traffic congestion and delays, particularly during peak construction periods involving large deliveries or workforce movements.
- Temporary deterioration of road conditions resulting from frequent use by heavy vehicles and abnormal loads.
- Potential disruption to existing industrial operations and road users within the RBIDZ due to the movement of abnormal loads and large equipment.

Vehicular traffic during normal operations at the proposed Plant is described in Section 9.5.9 above in terms of the following:

- Staff traffic;
- General traffic;
- Hazardous materials delivery traffic;
- General (non-hazardous) delivery traffic; and
- Water treatment sludge and oil-water separator collection.

The potential impacts related to traffic during the operation and maintenance of the Plant include:

- Increased traffic volumes associated with operational personnel, maintenance contractors and routine service vehicles.
- Increased heavy vehicle traffic associated with the delivery of chemicals, lubricants, transformer oil, diesel (if required for backup operation) and other consumables required for plant operation.
- Traffic associated with the collection and transportation of waste materials, including waste oil, sludge and other hazardous wastes generated by the facility.
- Increased risk of vehicle accidents involving staff, service providers and heavy vehicles.
- Localised increases in noise and air emissions associated with operational traffic.
- Wear and deterioration of road infrastructure over the life of the facility due to repeated heavy vehicle usage.
- Potential impacts associated with hazardous material transport, including the risk of accidental spills or releases during transportation.

A Traffic Impact Assessment for the broader Phase 1F development of the RBIDZ was previously undertaken in 2013, which was updated in 2024 (see Section 12.15 above). The assessment evaluated the existing road network, projected traffic growth associated with industrial development within Phase 1F, and identified road infrastructure upgrades required to accommodate future development within the precinct.

13.23.2 Impact Assessment

Theme	Traffic
Relevant Alternatives & Activities	All activities that may affect existing road networks

Project life-cycle	Construction phase
Proposed Management Objectives / Mitigation Measures	
▪ Make use of the existing and planned road infrastructure serving RBIDZ Phase 1F and comply with any traffic management and road upgrade requirements implemented by the RBIDZ and relevant road authorities. ▪ Schedule deliveries outside peak traffic periods, where practical. ▪ Utilise designated routes approved by the relevant authorities (including SANRAL, KZN DoT and CoU, a relevant). ▪ Ensure all abnormal loads comply with applicable permitting requirements. ▪ Implement road safety measures and appropriate signage. ▪ Maintain all construction vehicles in a roadworthy condition. ▪ Repair any damage caused to roads by construction-related traffic. ▪ Strict adherence to speed limits by construction vehicles on public roads and access roads. ▪ Maintain road signage and flag personnel at critical points.	

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	local	medium-high	short- to medium-term	likely	Moderate
After Mitigation	-	local	low	short-term	unlikely	Minor

Project life-cycle	Operational phases
Proposed Management Objectives / Mitigation Measures	
▪ Restrict heavy vehicle movements to approved access routes. ▪ Maintain a Traffic Management Plan throughout the operational phase. ▪ Ensure hazardous material transportation complies with applicable legislation and standards. ▪ Schedule deliveries to minimise congestion and operational disruptions. ▪ Conduct routine road safety awareness training for drivers and contractors. ▪ Maintain internal roads and traffic control infrastructure. ▪ Implement emergency response procedures for traffic accidents and hazardous material spills.	

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	local	low	long-term / permanent	unlikely	Minor
After Mitigation	-	local	low	long-term / permanent	rare	Negligible

13.24 Existing Structures and Infrastructure

13.24.1 Impact Description

The Project could cause the following impacts to existing structures and infrastructure:

- ❑ Construction phase –
  - Accidental damage to existing underground and above-ground services, including water pipelines, sewer infrastructure, stormwater systems, electricity infrastructure, telecommunication services and other utilities.
  - Temporary disruption or interruption of services to existing RBIDZ tenants and infrastructure users.

- Damage to existing roads, kerbs, culverts and stormwater infrastructure due to construction traffic and abnormal load movements.
- Potential conflicts with existing or planned utility corridors and servitudes.
- Health and safety risks associated with working in proximity to existing services and infrastructure.

❑ Operational phase –

- Increased demand on existing utility infrastructure, including water supply and wastewater systems.
- Potential disruption to services during maintenance or repair activities.
- Long-term wear and deterioration of access roads associated with operational traffic and maintenance activities.
- Risks associated with failure or interruption of external utility services required for Plant operation.
- Requirement for ongoing access to utility servitudes and existing operational infrastructure.

A detailed survey will be conducted to identify all physical features that are located within the final project footprint. Optimisation of the layout during the design phase will seek to avoid existing structures and infrastructure, where possible. The setbacks / conditions required by the custodians of infrastructure in proximity to the site will need to be adhered to.

13.24.2 Impact Assessment

Theme	**Existing structures and infrastructure**
Relevant Alternatives & Activities	**All activities that may affect existing structures and infrastructure**
Project life-cycle	**Construction and operational phases**
Proposed Management Objectives / Mitigation Measures	
▪ Identify, record and safeguard existing services and infrastructure. ▪ Liaise with RBIDZ, utility providers and relevant infrastructure custodians prior to commencing construction activities. ▪ Conform to requirements of relevant service providers and infrastructure custodians. Adhere to setback requirements and servitude restrictions applicable to existing infrastructure. ▪ Ensure access to infrastructure is available to service providers at all times. ▪ Immediately notify the relevant authority or service provider of any disturbance or damage to infrastructure. Repair or reinstate damaged infrastructure in consultation with the relevant infrastructure owner. ▪ Maintain records of infrastructure disturbances, incidents and corrective actions. ▪ Implement routine inspections and maintenance of operational infrastructure and service connections.	

	+/- Impacts	**Extent**	**Magnitude**	**Duration**	**Probability**	**Significance**
Before Mitigation	-	local	medium-high	long-term to permanent	Possible to Likely	Major
After Mitigation	-	local	low	short-term	unlikely	Minor

13.25 Palaeontology

The outcomes of the Desktop Palaeontology Impact Assessment (Banzai Environmental, 2026) are presented below. The specialist report is contained in **Appendix E15**.

13.25.1 Impact Assessment

A summary of the impacts from a palaeontological perspective is provided in Table 89 below.

Table 89: Summary of impacts from palaeontological perspective (Banzai Environmental, 2026)

NATURE	Loss of fossil heritage by destruction, movement or sealing in of fossil heritage in or below the earth's surface.							
DEVELOPMENT PHASE	DEVELOPMENT IMPACT			IMPACT RATING		RECOMMENDED MITIGATION	IS IMPACT ACCEPTABLE?	
	CRITERIA	*BM	**AM	BEFORE MITIGATION	AFTER MITIGATION		*BM	**AM
Planning Phase	Extent			No Impact	No Impact	NONE	None	None
	Probability							
	Reversibility							
	Irreplaceability							
	Duration							
	Cumulative Effect							
	Magnitude							
	Impact Significance							
Construction Phase	Extent	1	1	Negative Low impact	Negative low impact	NONE	NO	YES
	Probability	2	2					
	Reversibility	4	4					
	Irreplaceability	2	2					
	Duration	4	4					
	Cumulative Effect	1	1					
	Magnitude	1	1					
	Impact Significance	14	16					
Operational Phase	Extent			No Impact	No Impact	NONE	None	None
	Probability							
	Reversibility							
	Irreplaceability							
	Duration							
	Cumulative Effect							
	Magnitude							
	Impact Significance							
Decommissioning Phase	Extent			No Impact	No Impact	NONE	None	None
	Probability							
	Reversibility							
	Irreplaceability							
	Duration							
	Cumulative Effect							
	Magnitude							
	Impact Significance							

* BM = before mitigation; AM = After mitigation

13.25.2 Mitigation Measures

If significant fossil remains or trace fossils are discovered during construction, either on the surface or exposed by excavations, a Chance Finds Procedure be implemented.

13.26 "No-Go" Impacts

The "no-go option" is the alternative of not implementing the activity / development. The "no-go option" also provides the baseline against which the impacts of other alternatives are compared.

The "no go option" needs to be considered in light of the motivation for the Project (see Section 3 above). The implications of the "no-go option" are discussed in Section 10.3 above. While the 'no-go option' eliminates the potential environmental impacts of the Project, it would also result in the loss of the socio-economic and strategic benefits associated with the Project.

The assessment identified a number of potentially significant environmental impacts associated with the proposed development. However, based on the findings of the specialist studies, these impacts are not considered to be fatal flaws and are expected to be effectively manageable through the implementation of the mitigation and management measures contained in this EIA Report and the EMPr.

In light of the above, the proposed Project is considered preferable to the "no-go option".

13.27 Cumulative Impacts

13.27.1 Introduction

A cumulative impact, in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.

Cumulative impacts can be identified by combining the potential environmental implications of the Project with the impacts of projects and activities that have occurred in the past, are currently occurring, or are proposed in the future within the Project's Area of Influence (AOI). It is noted that the accurate characterisation of the future state of the project area is inherently speculative to an extent, due to the dynamic nature of future decisions related to land use, water use (consumptive, waste-related and encroachments), protection of terrestrial and aquatic biological resources, etc.

According to the International Finance Corporation (IFC) Good Practice Handbook (Cardinale & Greig, 2013), cumulative impacts are contextual and encompass a broad spectrum of impacts at different spatial and temporal scales. The spatial AOI encompasses the geographical area impacted by the Project. The timescale over which the Project is likely to cause impacts include the

construction and operational phases. Should decommissioning be required in the future, the activity will need to comply with the appropriate and prevailing environmental legislation and best practices at that time.

13.27.2 Current and Reasonably Defined/Foreseeable Third-Party Projects

13.27.2.1 Introduction

Key considerations for identifying past, existing and future third-party projects in the context of the proposed CCGT Power Plant include the following:

- ❑ Industrial developments and operations;
- ❑ PoRB operations and expansion;
- ❑ Urban-related developments;
- ❑ Ongoing agricultural and mining activities in the region; and
- ❑ Change in land uses from agricultural and natural areas to accommodate development.

The sections to follow focus on industrial developments and proposed expansion of the PoRB.

13.27.2.2 Industrial Developments

The known existing industrial facilities or projects within a 10 km radius of the site are listed in Table 90 and shown in Figure 92 below.

Table 90: List of known industrial facilities/projects within a 10 km radius of the site

No.	Industrial Facilities/Projects	Status
1.	Richards Bay Alloys	Existing
2.	Bayside Aluminium Richards Bay	Existing
3.	Hillside Aluminium Richards Bay	Existing
4.	Foskor Richards Bay	Existing
5.	Richards Bay Woodchip Mill	Existing
6.	Wilmar Processing	Existing
7.	Fermentech	Existing
8.	Mondi Richards Bay	Existing
9.	PoRB Coal Terminal	Existing
10.	PoRB Multi Purpose Terminal	Existing
11.	PoRB Tank Terminal	Existing
12.	Richards Bay Gas to Power	Authorised (ref.: 14/12/16/3/3/2/867)
13.	Richards Bay CCPP	Authorised (ref.: 14/12/16/3/3/2/1123)
14.	Phinda Power 320MW Emergency Risk Mitigation Power Plant (RMPP)	Authorised (ref.: 14/12/16/3/3/2/2041)
15.	Phakwe Gas Power 3 CCPP	Authorised (ref. 14/12/16/3/3/2/2117)
16.	Chlor-Alkali Plant	Authorised (ref.: DC28-0003-2018)
17.	PoRB Gas to Power via Powership	*To be confirmed by TNPA*

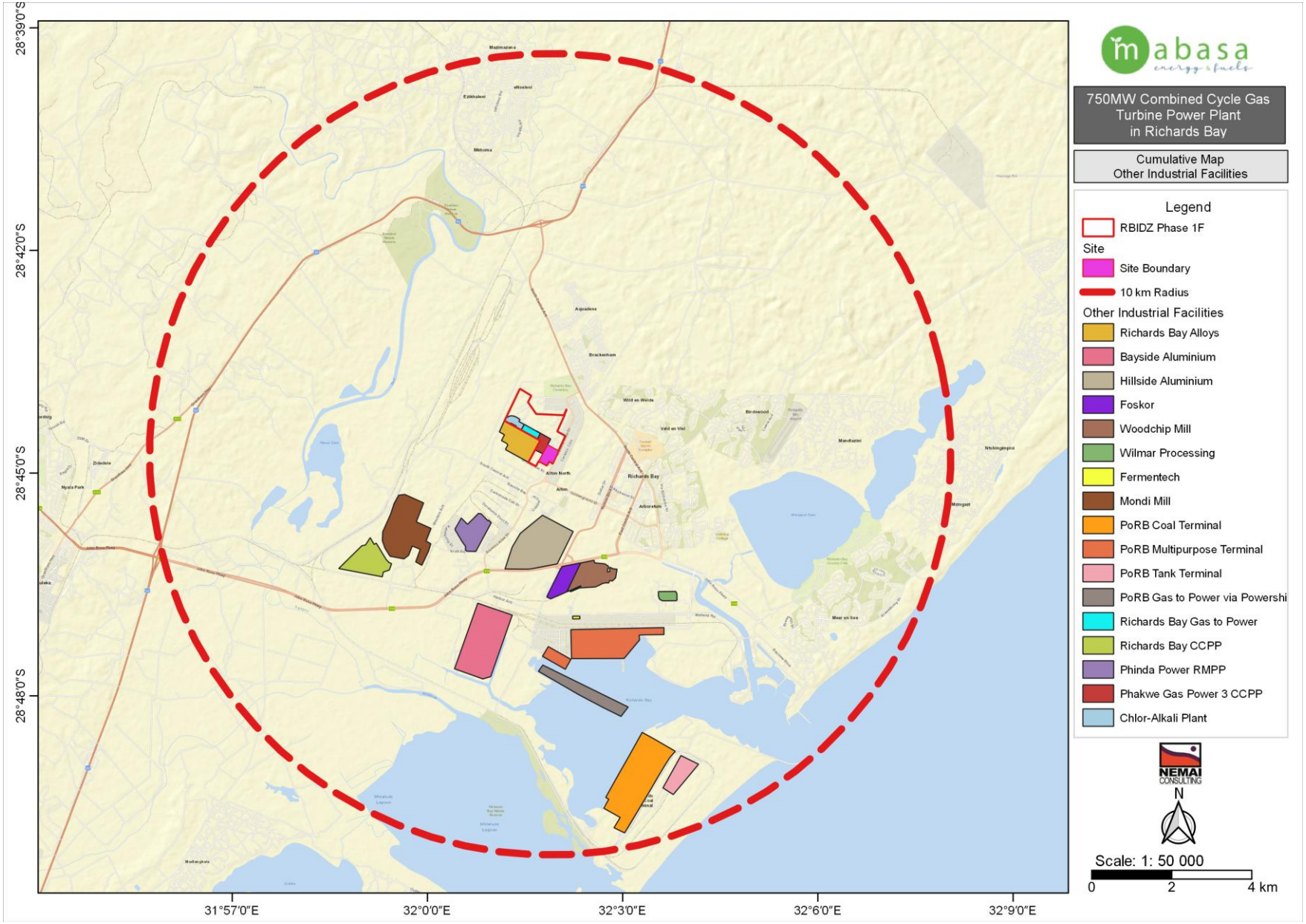

Figure 92: Cumulative map – industrial facilities within a 10 km radius of the site

13.27.2.3 PoRB Proposed Expansion

The PoRB is divided into the following three precincts (shown in Figure 93 below):

- Bayvue – accommodates the Multi Purpose Terminal and Dry Bulk Terminal;
- South Dunes – accommodates coal and liquid bulk terminals; and
- Newark – includes a small craft harbour, repair quay and tug jetty.

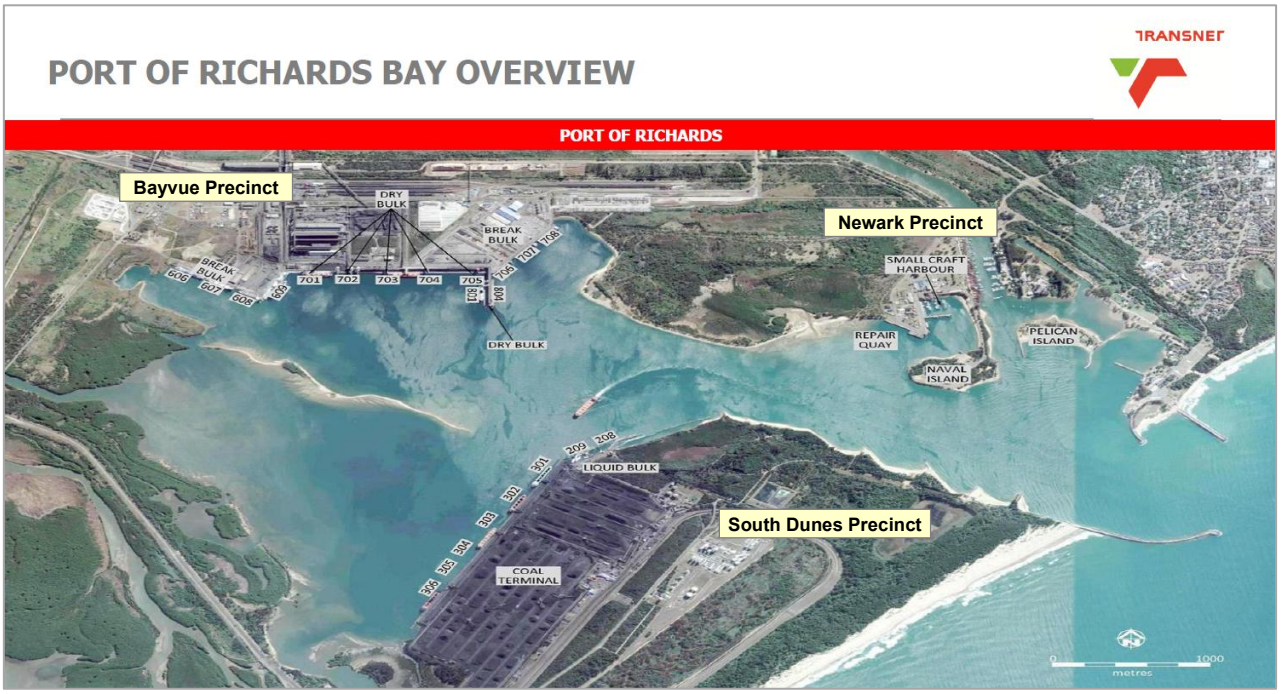

Figure 93: PoRB Overview

The National Ports Act (Act No. 12 of 2005) prescribes that TNPA is to prepare and periodically update a Port Development Framework Plan (PDFP) for each port. This process ensures that the development plans remain current, aligned with national policies and inclusive of changes in the respective ports' environments. The PDFP addresses the projected demand and capacity requirements of each port. The Port Master Plan (PMP) for the PoRB serves to fast track priority developments for 2021 – 2035.

The projects proposed in the PMP are listed in Table 91 and shown in Figure 94 below.

Table 91: Description of PoRB PMP Projects

PMP Project	Project Description
Bayvue Precinct	
1. Truck Staging Upgrade	Improve efficiency to accommodate the growth demand of Road Motor Transport (RMT).
2. Tippler 3	Improve efficiency. Rail unloading equipment to increase offloading capacity.
3. Expand Bulk Stockyard	Create capacity as part of Port Growth Initiatives. The stockyards for growing volumes in the long term will expand to allocated space adjacent to the northern boundary of the PoRB.

PMP Project	Project Description
4. Internal Road Link	Improve efficiency to support the proposed Expansion Projects. Create a direct road link between RBIDZ and the Port.
5. East Gate Upgrade	Improve efficiency to manage the entry and exit within the Port. Resolve current RMT constraints.
6. Ph2 Rail Yard Upgrade	Improve efficiency to deal with the current rail yard constraints/bottlenecks, as well as handling new generation of trains.
7. Rail Balloon	Create capacity to increase rail handing from 100 to 150 wagons.
8. Mega Chrome Terminal	The strategy for the PoRB is to centralise the Mega Chrome Terminal. The proposed project aims to create capacity by consolidating all chrome to be handled at one terminal. This will also serves to improve efficiency.
9. Container Stackyard	Create capacity and improve efficiency by increasing container handling from 50 000 twenty-foot equivalent units (TEU) to 200 000 TEU's.
10. Container Handling Berth	Create capacity and improve efficiency by increasing container handling from 50 000 TEU's to 200 000 TEU's.
11. Berth 708 Lengthening	Create capacity to be able to handle Newer Generation.
12. Mega Chrome Berths	Create capacity by consolidating all chrome to be handled at one terminal also help with efficiency. Berths currently at capacity. The proposed project entails the development of new berths 802 and 803 to compliment the Mega Chrome Terminal.
13. Mixed Bulk Berths	Create capacity as part of Port Growth Initiatives.
South Dunes Precinct	
14. Berth 210 - Liquid Bulk	Create capacity as part of Port Growth Initiatives.
15. LNG Berth 207	Create capacity as part of Port Growth Initiatives. Enable the importation of LNG.
16. LNG Storage	Expand by supplying LNG to land-based regasification facility.
17. Liquid Bulk Precinct Expansion	Create capacity as part of Port Growth Initiatives. Required for increase in demand forecast.
18. Green Belt Offset	The Green Belt Offset project was identified to mitigate impacts associated with the unlocking of future liquid bulk lease sites in South Dunes Precinct. This is thus not a project that proposes development in the Port, but rather entails setting aside land for conservation purposes as a form of mitigation.
Newark Precinct	
19. Relocation of Navy to Naval & Pelican Islands	Complementary Port System: Port of Durban Growth Initiatives. The intention is for the Navy to relocate from the Port of Durban to the PoRB. The scope of work for this project includes building a new Navy base comprising quays, buildings, services, roads, etc.
20. Cruise Terminal	Capacity Creation: Port Growth Initiatives. Currently, passenger vessels are handled at the 600 series and the repair quay in the PoRB. The 600 series is not conducive for a cruise liner. The repair quay is used to respond to emergency maintenance of crafts. The intention is to develop the back of quay area into a passenger terminal facility in line with CoU's plans for a waterfront development, which will increase tourism in the area. The scope of work for this project is to develop a new cruise terminal and to construct the associated bulk services.

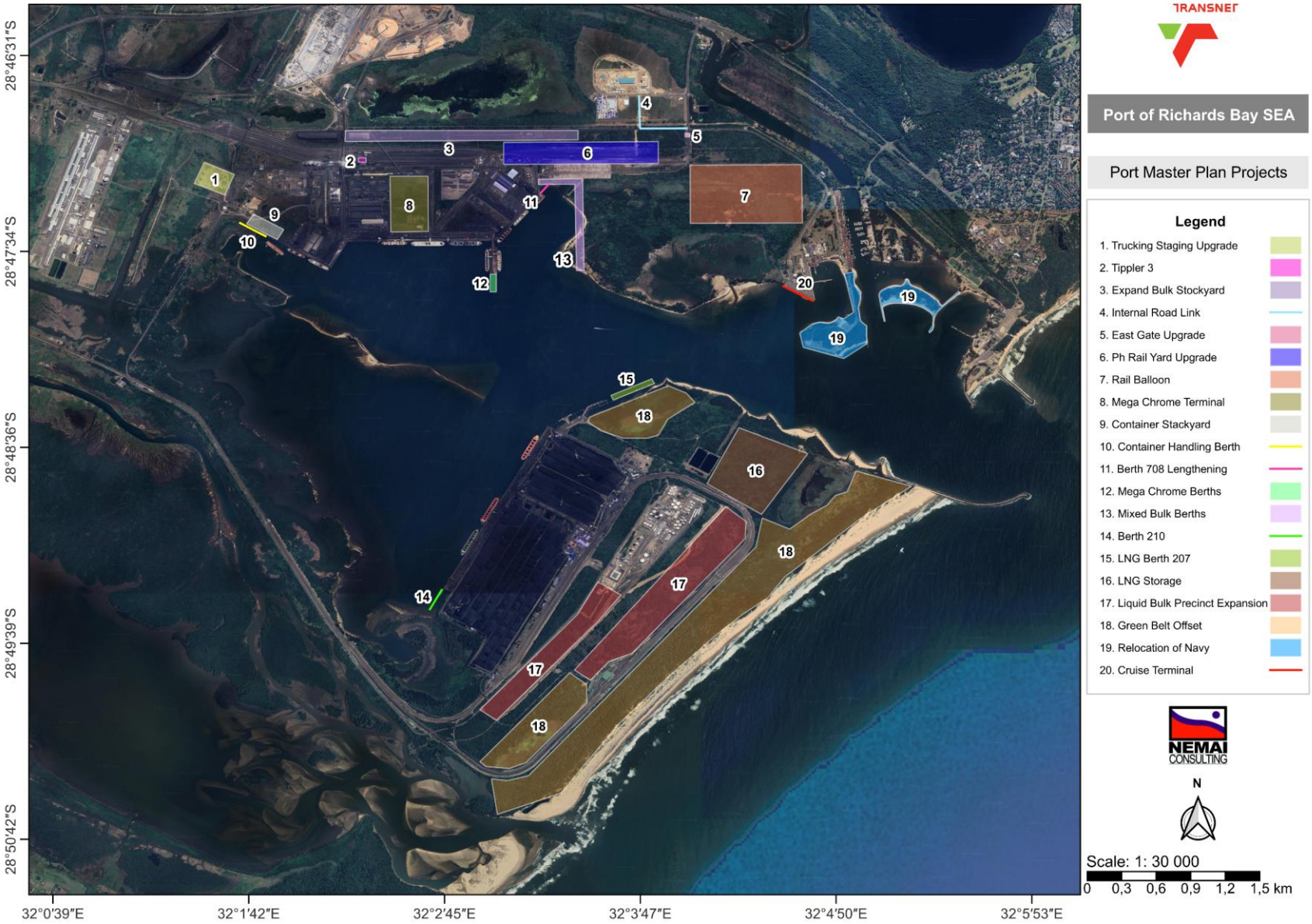

Figure 94: Projects in the PoRB PMP (Nemai Consulting, 2024)

13.27.3 Cumulative Impacts Assessed by Specialists

13.27.3.1 Climate Change

The evaluation of cumulative impacts from the Climate Change Impact Assessment (Promethium Carbon, 2026) (refer to report contained in **Appendix E1**) is presented below.

The Climate Change Impact Assessment concluded that the proposed Plant will result in a net increase in GHG emissions over its operational life and will therefore contribute incrementally to the cumulative concentration of GHGs in the atmosphere. The majority of lifecycle emissions are associated with the operational phase of the facility, while smaller contributions arise from construction activities, the upstream natural gas supply chain, and decommissioning activities. The cumulative climate change impact is global in nature, as project emissions combine with emissions from other sources worldwide and contribute to long-term climate change.

Although the Project's contribution represents a relatively small proportion of global emissions, the emissions are considered material in a South African context and must be viewed against the country's climate change mitigation commitments and emissions-reduction objectives. The assessment notes that natural gas-fired generation is generally less carbon-intensive than coal-fired power generation and may support the integration of renewable energy by providing dispatchable capacity. However, the Project would nevertheless add to the national greenhouse gas inventory and contribute to cumulative climate change impacts over the lifespan of the facility.

The assessment further indicates that the Project may be exposed to climate-related risks associated with rising temperatures, changes in rainfall patterns, flooding, water scarcity, and extreme weather events. These risks could affect plant efficiency, infrastructure integrity, water availability, and supply-chain reliability. Consequently, climate resilience measures should be incorporated into the design, construction, operation, and decommissioning phases of the Project. Recommended measures include maximising plant efficiency, minimising fugitive methane emissions, implementing climate-resilient infrastructure design, providing adequate stormwater and flood protection measures, and incorporating climate risks into operational and emergency response planning.

Overall, the cumulative climate change impact of the Project is considered to arise primarily from its contribution to long-term atmospheric GHG concentrations, with significance determined by the scale and duration of emissions and their relevance to South Africa's emissions trajectory and energy transition objectives.

13.27.3.2 Air Quality

The evaluation of cumulative impacts from the Air Quality Impact Assessment (uMoya-NILU, 2026) (refer to report contained in **Appendix E2**) is presented below.

The following two scenarios were included in the assessment of cumulative air quality impacts:

- Scenario 3: Cumulative - Mabasa CCPP in combined-cycle mode with the contribution of existing industrial sources (Mondi, Foskor, Richards Bay Minerals, Tongaat Hullet Felixton, Transnet Port Terminals, South 32 and MPACT).
- Scenario 4: Cumulative - Mabasa CCPP in combined-cycle mode with the contribution of industrial sources (listed under Scenario 3 above) and the following approved future facilities:
  - Elegant Afro Chemicals Chlor-Alkali Plant in the RBIDZ;
  - Eskom 3000 MW CCPP in the RBIDZ;
  - Nseleni Power Corporation Limited Floating CCPP in the Port of Richards Bay;
  - Nyanza Light Metals Titanium Dioxide Pigment Plant in the RBIDZ;
  - Phakwe Richards Bay Gas 3 CCPP in the RBIDZ; and
  - Phinda Richards Bay 320 MW gas PP in Alton industrial.

The following is noted in terms of the cumulative air quality impact ratings linked to the above scenarios (see Table 62 above):

- For Scenarios 3, emissions from the proposed Mabasa CCPP operating in Combined Cycle mode with the contribution of other industries. This is a hypothetical case for two reasons. One, the suite of industries generally operates below the permitted maximum emissions, and two, it is unlikely, but not impossible, that the suite of industries simultaneously emits at the permitted maximum concentration. Using the permitted maximum emissions rather than actual emissions therefore present a possible worst-case scenario. The predicted ambient SO_2, NO_2 and PM_{10} concentrations exceed the NAAQS, and the cumulative assessments of other industries with the Mabasa CCPP is predicted to be medium. A medium rating is applied considering the hypothetical nature of the emissions used. Note that the relative contribution from the Mabasa CCPP to this scenario is low.
- For Scenarios 4, emissions from the proposed Mabasa CCPP operating in Combined Cycle mode with the contribution of other industries and approved projects, the predicted ambient SO_2, NO_2 and PM_{10} concentrations exceed the NAAQS. This is also a hypothetical case for a few reasons. Firstly, the suite of industries generally operates below the permitted maximum emissions. Secondly, the approved projects are natural gas projects and will operate well below the MES for SO_2 and particulates due to the nature of natural gas. Lastly, but not impossible that the suite of industries simultaneously emits at the permitted maximum concentration. Using the permitted maximum emissions rather than actual emissions therefore present a possible worst-case scenario. The predicted ambient concentrations for Scenario 4 are somewhat higher than for Scenario 3. In other words, the collective of the approved projects has a relatively small additive effect to industries assessed. The cumulative assessments of other industries and approved projects with the Mabasa CCPP is predicted to be medium. A medium rating is applied considering the hypothetical nature of the emissions used. Note that the relative contribution from the Mabasa CCPP to this scenario is low.

The cumulative assessment of the Mabasa CCPP with other industrial sources and with future sources raises an important flag for air quality management in Richards Bay. These hypothetical

assessments demonstrate that ambient air quality in Richards Bay can be significantly affected if the industrial facilities simultaneously operate at their maximum permitted emissions, or generate electricity with fuel other than Natural Gas.

13.27.3.3 Hydrology

The evaluation of cumulative impacts from the Hydrology Assessment (GCS, 2026) (refer to report contained in **Appendix E7**) is presented below.

Based on the site's hydrological conditions, identified hydrological linkages, and potential local-scale impacts, no impacts to the greater hydrological cycle are anticipated. Runoff will still be allowed to enter the watercourses (canal) to maintain the current ecology.

The hydrology impact assessment assessed the cumulative impacts of the projects within a 30 km radius of the site (retrieved from the SA Renewable Energy EIA Applications Website, hosted by DFFE – date of access 12/03/2026) (refer to Table 92 and Figure 95 below).

Table 92: Summary of other projects within a 30km radius of the site (GCS, 2026)

DEA Reference	Project Title	Application Received	Applicant	Project Status
14/12/16/3/3/2/2041	The 320MW emergency PV mitigation power plant (RMPP) and associated infrastructure on sites located in Alton, Richards Bay within the uMhlathuze Local Municipality in KwaZulu-Natal Province	30/11/2020	Phinda Power Projects (Pty) Ltd	Approved
14/12/16/3/3/2/867	400 MW Richards Bay Power Facility on Erven 17455, 17443 and 17442 within the Richards Bay Industrial Development Zone, uMhlathuze Local Municipality in the KwaZulu-Natal Province	15/06/2016	Richards Bay Gas Power 2 (Pty) Ltd	Approved
14/12/16/3/3/2/2117	The construction and operation of the Phakwe Richards Bay gas power 3 combined cycle power plant (ccpp), Richards Bay, KwaZulu-Natal Province.	12/11/2021	Richards Bay Gas Power 3 (Pty) Ltd	Approved
14/12/16/3/3/1/2258	The proposed 132kV underground transmission infrastructure and associated switching station on sites located in Alton, Richards Bay, KwaZulu-Natal Province	13/11/2020	Phinda Power Projects (Pty) Ltd	Approved
14/12/16/3/3/2/2032	Proposed Nseleni Independent Floating Power Plant (NIFPP) and associated infrastructure for the evacuation of power from the NIFPP to the National Grid, Port of Richards Bay, KwaZulu-Natal	05/11/2020	Nseleni Power Corporation Pty (Ltd)	Refused
14/12/16/3/3/2/2033	Proposed Liquefied Natural Gas (LNG) receiving and storage facility and associated physical infrastructure to support the Nseleni Independent Floating Power Plant, Port of Richards Bay, KwaZulu-Natal.	05/11/2020	Anchor Energy Pty (Ltd)	Refused

14/12/16/3/3/2/2007	The Proposed Gas to Power Powership Project at Port of Richards Bay within uMhlathuze Local Municipality, King Cetshwayo District, KwaZulu-Natal Province.	08/10/2020	Karpowership SA (Pty) Ltd	Refused

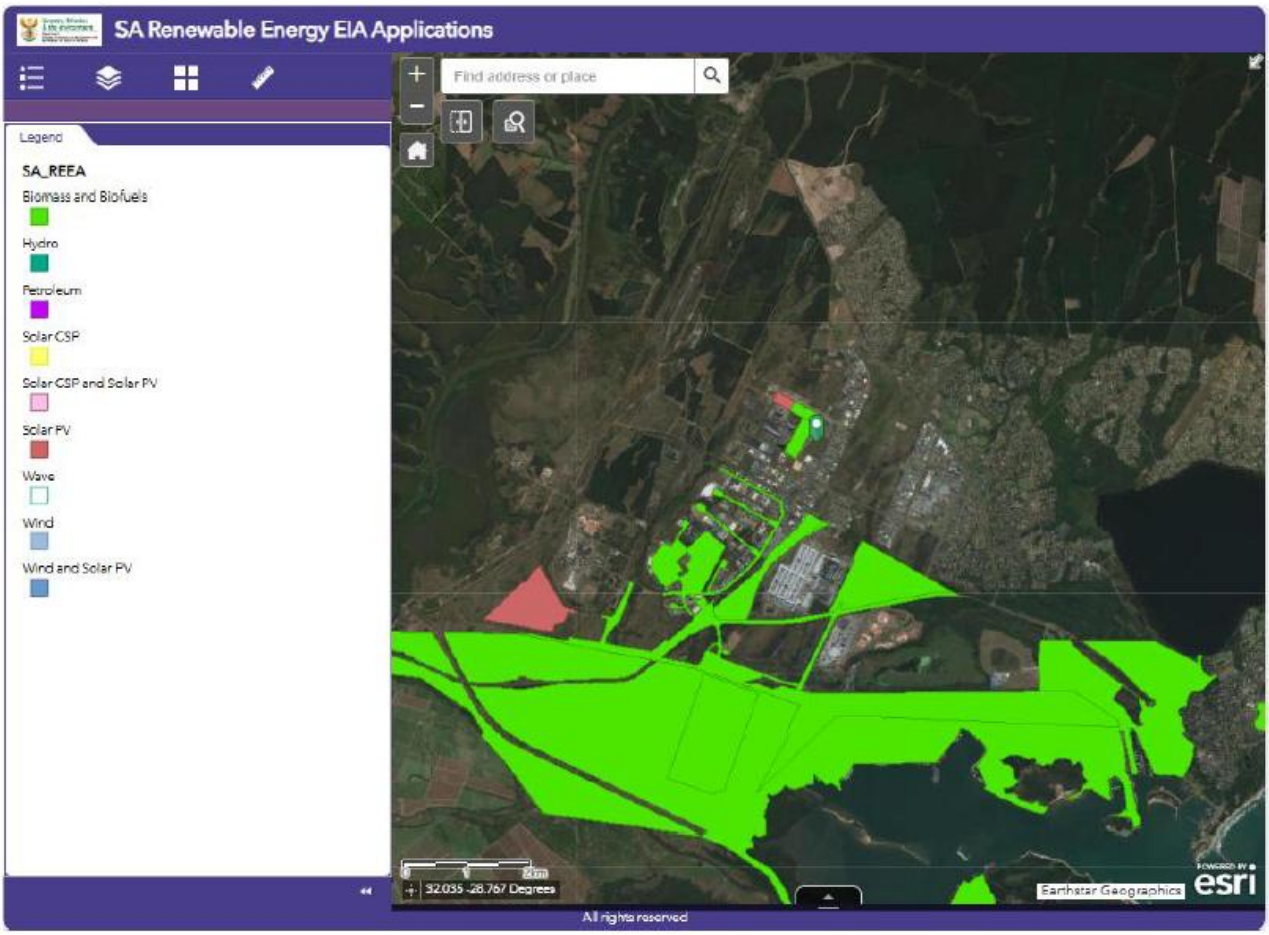

Figure 95: Overview of other projects associated with the project area (DFFE, 2024 as cited in GCS, 2026)

In terms of the construction and operational phases, there are expected cumulative hydrological impacts on the site soils. The impact is expected to improve once development has ceased. No cumulative hydrological impacts are expected from the proposed projects mentioned above. The increase in runoff volumes from the site will be marginal, due to the proposed project scale.

13.27.3.4 Aquatic Biodiversity

The evaluation of cumulative impacts from the Freshwater Ecosystem Assessment (SAS, 2026) (refer to report contained in **Appendix E3**) is presented below.

Freshwater ecosystems within the region are already under sustained pressure from ongoing residential expansion, agricultural activities, and mining operations (including sand and coal extraction), which have collectively contributed to the progressive degradation of ecological integrity

and functioning. These pressures have resulted in the ongoing loss, fragmentation, and modification of freshwater habitats, particularly wetlands.

Within the broader RBIDZ and surrounding areas, the expansion of industrial infrastructure has intensified these pressures, with significant cumulative losses of inter-dunal wetlands and swamp forest systems. These systems are groundwater-dependent and are therefore highly sensitive to changes in hydrological processes, particularly reductions in recharge and alterations to diffuse flow regimes. The proposed development will result in the complete infilling of wetlands within the study area, and as such, avoidance of impacts to these systems has not been achieved. This represents a direct and permanent loss of wetland habitat and associated ecological functions and will contribute to the existing cumulative trajectory of wetland transformation within the region. Furthermore, these impacts must be considered in the context of not only wetlands within the immediate study area, but also the wetlands within the surrounding landscape, which collectively contribute to catchment-scale hydrological functioning and ecological resilience.

The cumulative loss of wetlands and vegetated areas within the catchment increases the risk of flooding, particularly during high rainfall events, due to reduced attenuation capacity and increased impervious surfaces associated with development. Given that impacts to wetlands will not be avoided, and that the loss is permanent and irreversible, the proposed development is expected to contribute to high cumulative impacts within the region, particularly in relation to groundwater-driven wetland systems.

As mentioned in various sections of this report, an EA in terms of NEMA was granted by the former DEA, now known as DFFE, for the RBIDZ Phase 1F in Sept 2016 (reference no.: 14/12/16/3/3/2/665). The listed activities covered in this EA included, amongst others, the infilling of wetlands to enable the development of the site for industrial purposes (see Figure 5 above). This is also acknowledged in the Freshwater Ecosystem Assessment Report. Section 5.1.4.2 further explains that approval was also obtained in terms of the NWA for the infilling of the wetlands on the site (see Figure 6 above).

13.27.3.5 Terrestrial Biodiversity

The evaluation of cumulative impacts from the Floral Assessment (STS, 2026b) (contained in **Appendix E5**) and Faunal Assessment (STS, 2026c) (contained in **Appendix E6**) are presented below.

13.27.3.5.1 Floral Assessment

To assess potential cumulative impacts on vegetation and plant species associated with the proposed development, consideration was given to past, present, and reasonably foreseeable future land-use changes in the Richard's Bay area. The region has experienced sustained urban and industrial expansion, resulting in the progressive transformation and fragmentation of natural habitats historically associated with the Maputaland Wooded Grassland ecosystem.

The study area is situated within a landscape that is already substantially modified, with surrounding land uses characterised by industrial infrastructure, road development, and transformed open areas. While some remnant habitat persists in the broader area, these are generally fragmented and occur as isolated patches with varying levels of ecological integrity. The vegetation within the study area itself reflects this broader trend, with much of the site being degraded and only partially representative of the reference ecosystem. The following cumulative considerations are relevant:

- The proposed development will contribute to the continued loss of vegetation within a landscape already undergoing transformation. However, the affected area is limited in extent and of reduced ecological condition, and therefore its contribution to cumulative habitat loss is considered to be lower.
- While cumulative habitat fragmentation is a concern at a regional scale, the study area is already functionally disconnected from larger natural systems due to surrounding development and existing barriers. As such, the loss of this site is not expected to materially influence landscape-scale connectivity.
- Expansion of developed areas may increase edge interfaces, potentially resulting in localised disturbance to adjacent habitats (where present). However, given the already transformed nature of the surrounding environment, these effects are expected to be limited and manageable.
- Disturbance associated with development may contribute to increased propagule pressure within the landscape. This represents an ongoing cumulative risk, although it is not unique to the proposed development and can be effectively managed through appropriate mitigation measures.
- Changes to surface runoff associated with increased impervious surfaces may contribute cumulatively to altered drainage patterns. However, given the scale of the development and the modified nature of surrounding systems, these impacts are expected to remain localised and unlikely to significantly affect broader ecological functioning.

Given the above, the proposed development is expected to contribute incrementally, but not significantly, to cumulative ecological pressures within the broader Richard's Bay area. The loss of habitat within the study area is localised, occurs within a disturbed and partially transformed system, and does not represent a meaningful contribution to the decline of the Maputaland Wooded Grassland ecosystem at a regional scale.

With the implementation of appropriate mitigation measures, cumulative impacts associated with the proposed development are expected to remain low to moderate and consistent with existing land use trends. The development is therefore not anticipated to compromise the long-term persistence of the Maputaland Wooded Grassland ecosystem within the broader region.

13.27.3.5.2 Faunal Assessment

The study area has experienced several anthropogenic impacts over time, with mowing of grass and clearing of vegetation taking place in much of the study area at some point in time; and fragmentation, through extensive fencing and edge effects, have occurred within and surrounding

the study area due to its close proximity to human settlements and industry. These activities have degraded the habitat. As a result, common faunal classes, that are more resilient to disturbance, are anticipated to occur within the study area in intermediate abundances.

In the context of the largely disturbed surrounding environment, these fragmented habitats have become important refugia for faunal diversity. Any further loss or fragmentation of the remaining habitat and connected natural vegetation will reduce habitat continuity and further weaken ecological linkages across the landscape. Cumulatively, this will result in increasingly isolated natural areas that are no longer connected by functional corridors, with consequent declines in ecosystem functioning and the delivery of ecosystem services.

The development will lead to common faunal species being displaced from the proposed footprint areas into adjacent habitats. This will lead to increased competition for space and food resources within the study area and adjacent habitat units. Edge effects and AIP proliferation are more concerning over the long-term. AIP proliferation will ultimately lead to loss of viable habitat, on a potentially increased scale, in the surrounding areas, displacing faunal species further as indigenous floral species (faunal habitat and food resources) are displaced and lost. An additional cumulative impact that could increase substantially over the life of the development, if not mitigated, is littering and dumping of other waste material in sensitive areas or outside designated areas, which may negatively impact faunal habitat on an increased scale over time.

13.27.3.6 Noise

The evaluation of cumulative impacts from the Noise Impact Assessment (Enviro-Acoustic Research, 2026) (refer to report contained in **Appendix E8**) is presented below.

There is a very low risk of cumulative noises during the construction phase, as noises from other potential construction activities would be minor and have an insignificant impact on all noise sensitive receptors.

There is a potential cumulative noise risk should the proposed CCPP operate simultaneously with other power generation projects, with the risk limited to NSR09. The probability of a noise impact occurring on NSR09 and NSR10 is considered only possible, due to these noise sensitive receptors being located within the industrial area.

Other industrial projects are too far from the site to pose any potential risk for cumulative effects and their contribution can be excluded. The potential significance of the cumulative noise impacts summarised in Table 93 below.

Table 93: Potential cumulative operational noise impacts (Enviro-Acoustic Research, 2026)

Nature of Impact: Precautious approach, with night-time ambient sound level measurements indicating noise levels typical of an urban noise district though it should be noted that measurements were collected further than 150m from the R619 road. Ambient sound levels closer to the R619 will be higher. Considering the developmental character, a

rating level typical of a busy urban (main roads, business premises or workshops) noise district will be assumed (rating level of 50dBA).			
Impact description: Increase in ambient sound levels in the noise-sensitive residential areas north-east of, and the residential hostels to the south-east of the project site.			
Prior to Mitigation			
	Rating	Motivation	Significance
Magnitude	Moderate (6)	Operational noises (power generation activities) will result in a moderate change in night-time ambient sound levels at NSR09. The operating CCPP will be audible in the residential areas.	**Low (24)**
Duration	Long-term (4)	The noise impact relating to the operational phase can last up to 25 years.	
Extent ($\Delta L_{Aeq,D}$>7dBA)	Regional (3)	The noise impact would extent from the site, potentially as far as 1,000m.	
Probability	Possible (2)	It is possible that the higher noise level and change in ambient sound levels will impact on the closest noise sensitive receptor.	
Mitigation / Management Measures			
Mitigation: Significance of the construction noise impact is **low** for the scenario as conceptualized and additional mitigation measures are not required.			
Post Mitigation			
	Rating	Motivation	Significance
Magnitude	Moderate (6)	Operational noises (power generation activities) will result in a moderate change in night-time ambient sound levels at NSR09. The operating CCPP will be audible in the residential areas.	**Low (24)**
Duration	Long-term (4)	The noise impact relating to the operational phase can last up to 25 years.	
Extent ($\Delta L_{Aeq,D}$>7dBA)	Regional (3)	The noise impact would extent from the site, potentially as far as 1,000m.	
Probability	Possible (2)	It is possible that the higher noise level and change in ambient sound levels will impact on the closest noise sensitive receptor.	
Cumulative impacts: There is a medium potential of a cumulative noise impact when other power generation activities take place simultaneously with the 750MW CCPP project. Night-time noise levels may result in a noise impact of medium significance due to cumulative effects during the night-time period.			
Residual Risks: Noise levels will reduce after the operational phase, though noise levels may still be elevated (due to the other industrial activities associated with the industrial development zone).			

13.27.3.7 Health

The evaluation of cumulative impacts from the Community Health Impact Assessment (Niara Environmental Consultants, 2026) (refer to report contained in **Appendix E10**) is presented below.

The cumulative impact assessment confirms that the proposed Plant is located within an already industrially burdened, air quality-stressed, socially vulnerable and medically capacity-sensitive environment. The Project's standalone impacts are generally manageable; however, cumulative significance is materially higher for air quality, respiratory health, traffic safety, social determinants, health systems and psychosocial wellbeing.

The most important cumulative finding is that the proposed Plant adds incremental emissions and activity to a Richards Bay airshed where existing SO_2 exceedances and cumulative modelled

exceedances are already present. This makes cumulative respiratory and cardiovascular health the most sensitive pathway and the most likely basis for challenge if not addressed transparently.

The Project remains acceptable from a community health perspective only if its incremental contribution to cumulative impacts is actively minimised, monitored and transparently managed. The cumulative assessment therefore supports authorisation subject to strict emissions control, health-protective monitoring, effective stormwater and emergency systems, road safety measures, social management and meaningful community engagement.

The cumulative health impacts associated with the proposed Project are described in Table 94 below.

Table 94: Cumulative Impacts of the proposed Project (Niara Environmental Consultants, 2026)

EHA #	EHAs	Cumulative Impacts	Significance without Mitigation	Significance with Mitigation
1	Vector-related diseases	The project may contribute cumulatively to local vector nuisance where stormwater infrastructure, cooling water systems, laydown areas, containers, waste storage areas, blocked drains or poorly maintained sumps create stagnant water. This impact must be read together with existing wetland-like drainage features, the canal along the western boundary, industrial hardstanding and waste accumulation pressures in the broader RBIDZ environment. The main cumulative pathway is increased mosquito and rodent habitat, particularly during construction and early operation if housekeeping and drainage controls are weak.	Low negative. The project is not located in a known vector-borne disease hotspot, but unmanaged standing water and waste could create localised breeding conditions.	Negligible negative. With engineered drainage, routine inspection, waste control, removal of stagnant water, cooling water maintenance and pest/vector monitoring, the cumulative contribution is expected to be minor and manageable.
2	Acute respiratory infections and respiratory effects from housing	The most material cumulative impact is the addition of stack emissions from the CCGT plant, construction dust, diesel exhaust, operational traffic emissions and possible backup fuel emissions to an already industrialised Richards Bay airshed. Existing cumulative sources include Port of Richards Bay operations, Richards Bay Coal Terminal activities, shipping emissions, heavy haul transport, road freight, smelters, fertiliser/chemical industries, existing IDZ industries, nearby combustion sources and proposed future IDZ projects. The AQIA indicates that the project-alone impact is low, but cumulative scenarios predict exceedances for SO_2, NO_2 and PM_{10}. This may worsen respiratory irritation, asthma, COPD symptoms and cardio-respiratory vulnerability in sensitive receptors.	Moderate to High negative. Significance is driven by cumulative airshed stress and existing SO_2 exceedances, not by the plant alone. Children, elderly persons, pregnant women and people with asthma, COPD or cardiovascular disease are most vulnerable.	Moderate negative. Emissions controls, AEL compliance, combustion optimisation, stack monitoring, dust suppression, traffic controls and transparent air quality monitoring will reduce the project's contribution, but residual cumulative risk remains because the broader airshed is already burdened.
3	Veterinary medicine and zoonotic issues	Cumulative zoonotic risk is expected to be limited. The project is within an industrial estate and does not directly create an agricultural or livestock interface. Indirect cumulative risks may arise where labour influx, poor food waste control, informal vending, stray animals, rodents or unmanaged waste around worker areas increase human-animal contact. This risk may interact with existing urban/peri-urban animal movement and waste pressures.	Negligible to Low negative. The pathway is indirect and no site-specific zoonotic disease hotspot has been identified.	Negligible negative. Waste control, pest management, prohibition of animals in worker/site areas, food waste management and worker awareness will reduce the cumulative contribution to very low levels.
4	STIs, including HIV/AIDS	The project may contribute cumulatively to STI and HIV vulnerability through construction workforce mobilisation, labour influx, contractor movement, temporary accommodation, increased disposable	Moderate negative. While the project alone will not determine HIV/STI prevalence, it may amplify existing risk factors if workforce behaviour,	Low negative. Local recruitment, worker code of conduct, HIV/STI awareness, condom access, referral to testing/treatment, GBV prevention, accommodation controls

EHA #	EHAs	Cumulative Impacts	Significance without Mitigation	Significance with Mitigation
		income, transactional relationships and interaction with existing social vulnerabilities in KwaZulu-Natal. These pressures may combine with existing provincial HIV burden, unemployment, gendered vulnerability, mobility corridors and service demand. The risk is highest during peak construction and shutdown/maintenance periods.	accommodation and community interface are poorly managed.	and engagement with local health services materially reduce the project's cumulative contribution.
5	Soil-, water- and waste-related diseases	Cumulative impacts may arise where project-related stormwater, wastewater, cooling tower blowdown, hydrocarbon spills, transformer oil leaks, contaminated firewater, sewage or construction sediment add to existing industrial drainage pressures within the RBIDZ. The site drains toward a canal with wetland-like characteristics and is subject to flood-sensitive conditions. The cumulative health pathway is not current poor water quality, but failure of containment, clean/dirty water separation, spill response or flood protection, resulting in contact exposure, vector breeding, nuisance conditions or downstream contamination.	Moderate negative. Without controls, cumulative industrial hardening, flood risk and contaminant mobilisation could create meaningful local environmental health risk.	Low to Negligible negative. Proper stormwater design, bunding, oil-water separation, wastewater authorisation, blowdown management, spill response, firewater containment, surface water monitoring and flood-sensitive infrastructure placement reduce cumulative risk substantially.
6	Food- and nutrition-related issues	Cumulative food and nutrition impacts are indirect. Positive effects may arise from employment, supplier opportunities and improved household income. Negative cumulative effects may occur if labour influx and regional industrial growth increase pressure on housing, food prices, transport costs and basic services, affecting low-income households. No direct agricultural displacement is expected because the site is within the RBIDZ.	Low negative / Moderate positive. Negative effects are mainly affordability-related and indirect; positive effects depend on local benefit capture.	Negligible negative / Moderate positive. Local employment, local procurement, worker accommodation planning, transparent recruitment and support for local suppliers enhance positive food security outcomes while reducing inflationary and service-pressure effects.
7	Accidents/injuries	Cumulative injury risk arises from adding construction vehicles, abnormal loads, worker transport, operational logistics and maintenance traffic to an existing industrial transport network shaped by Port operations, RBIDZ logistics, road freight, heavy haul transport and public transport interfaces. Additional occupational injury risks arise from gas systems, turbines, HRSGs, steam systems, high-voltage switchyard infrastructure, cooling systems, work at heights, lifting operations, confined spaces and heat load.	Moderate to High negative. Without controls, severe injury or fatality risk is credible for workers, contractors, road users, pedestrians and emergency responders.	Low to Moderate negative. Construction traffic management, route planning, abnormal load controls, pedestrian safety, speed enforcement, driver induction, OHS systems, permit-to-work, emergency drills, confined-space controls and contractor management reduce risk, although residual industrial and road safety risk remains.
8	Exposure to potentially hazardous materials, noise and malodours	Cumulative hazardous exposure includes stack pollutants, fuel and gas handling, lube oils, transformer oils, maintenance chemicals, diesel backup systems, cooling tower drift, fire suppression residues, contaminated runoff, noise from industrial operations and traffic, and nuisance odours during abnormal events. These exposures interact with existing industrial	Moderate negative. Community exposure is mainly chronic and cumulative; occupational exposure may be acute and higher intensity. Noise is expected to be low for communities but remains relevant for workers.	Low negative. Hazardous material controls, chemical inventories, bunding, SDS management, occupational hygiene monitoring, hearing conservation, cooling tower/Legionella control, spill response, noise controls, complaint response and

EHA #	EHAs	Cumulative Impacts	Significance without Mitigation	Significance with Mitigation
		emissions, port activity, smelters, fertiliser/chemical industries, nearby combustion sources, traffic noise and community concern about pollution.		emergency preparedness reduce cumulative exposure.
9	Social determinants of health	The project may contribute positively through employment, income, skills development, local procurement and energy security. Negative cumulative effects may arise where multiple industrial projects increase labour influx, competition for jobs, unmet expectations, housing pressure, inequality, community tension, GBV risk, alcohol/substance harms and psychosocial stress. The cumulative social pathway is especially relevant in uMhlathuze and King Cetshwayo due to existing unemployment and inequality.	Moderate negative / Moderate positive. Benefits are meaningful but uneven; unmanaged expectations and labour influx may create social stress.	Low negative / Moderate to High positive. Transparent recruitment, local procurement, skills development, grievance management, worker code of conduct, GBV prevention, stakeholder engagement and social investment improve benefit distribution and reduce adverse cumulative social impacts.
10	Cultural health practices	Cumulative impacts may arise where project-related health concerns, perceived pollution, respiratory symptoms, stress or industrial anxiety are interpreted through plural health-seeking systems, including biomedical, traditional, spiritual and complementary care. Poor communication may delay formal care-seeking or increase mistrust. Conversely, culturally competent engagement may strengthen referral and early symptom recognition.	Low negative. The impact is indirect but relevant in KwaZulu-Natal's plural health system, particularly where risk communication is weak.	Negligible negative / Low positive. IsiZulu and English communication, culturally competent engagement, referral messaging, respect for traditional health practices and engagement through trusted local structures reduce misunderstanding and improve care-seeking behaviour.
11	Health systems issues	Cumulative pressure may arise from additional demand on clinics, hospitals, EMS and occupational health services due to construction injuries, traffic accidents, respiratory complaints, heat illness, chemical exposure, STI/HIV services and emergency incidents. This demand may combine with existing public health burdens in King Cetshwayo, including communicable disease, NCDs, trauma and primary healthcare constraints.	Moderate negative. The project alone is unlikely to overwhelm the system, but cumulative industrial and population pressures may strain PHC, emergency response and referral pathways.	Low negative. On-site first aid and occupational health capacity, private medical arrangements for workers, referral agreements, emergency response planning, EMS coordination, health surveillance and incident reporting reduce avoidable burden on public health facilities.
12	Non-communicable diseases	Cumulative NCD risk is linked to long-term exposure to air pollutants, particulate matter, industrial noise, psychosocial stress, heat exposure and socio-economic vulnerability. Existing industrial emissions, road freight, shipping, port operations, smelters, fertiliser/chemical facilities and future IDZ developments contribute to cumulative respiratory and cardiovascular risk. The project adds incremental emissions and occupational exposures to this burden.	Moderate to High negative. Significance is driven by chronic cumulative exposure and vulnerable receptors with asthma, COPD, cardiovascular disease, diabetes or other pre-existing illness.	Moderate negative. Emissions controls, monitoring, occupational health surveillance, worker wellness, complaint tracking, transparent communication and social benefit enhancement reduce project contribution, but residual cumulative NCD risk remains due to the broader industrial airshed.

13.27.3.8 Socio-Economic Environment

The evaluation of cumulative impacts from the Socio-Economic Impact Assessment (Urban-Econ, 2026) (refer to report contained in **Appendix E11**) is presented below.

The assessment examined if the construction and operation of the proposed development will result in:

- An unacceptable risk to the environment or surrounding communities;
- An unacceptable loss of environmental quality, resources, or biodiversity;
- Complete or large-scale changes to the environment or the community's sense of place; and
- An unacceptable increase in overall impact levels in the area.

The proposed Plant forms part of a cluster of gas-to-power and gas-infrastructure projects planned or underway in and around Richards Bay (see Figure 96 below). The following analysis outlines the expected cumulative impacts illustrating the proposed project's combined effects alongside existing and anticipated activities in the vicinity.

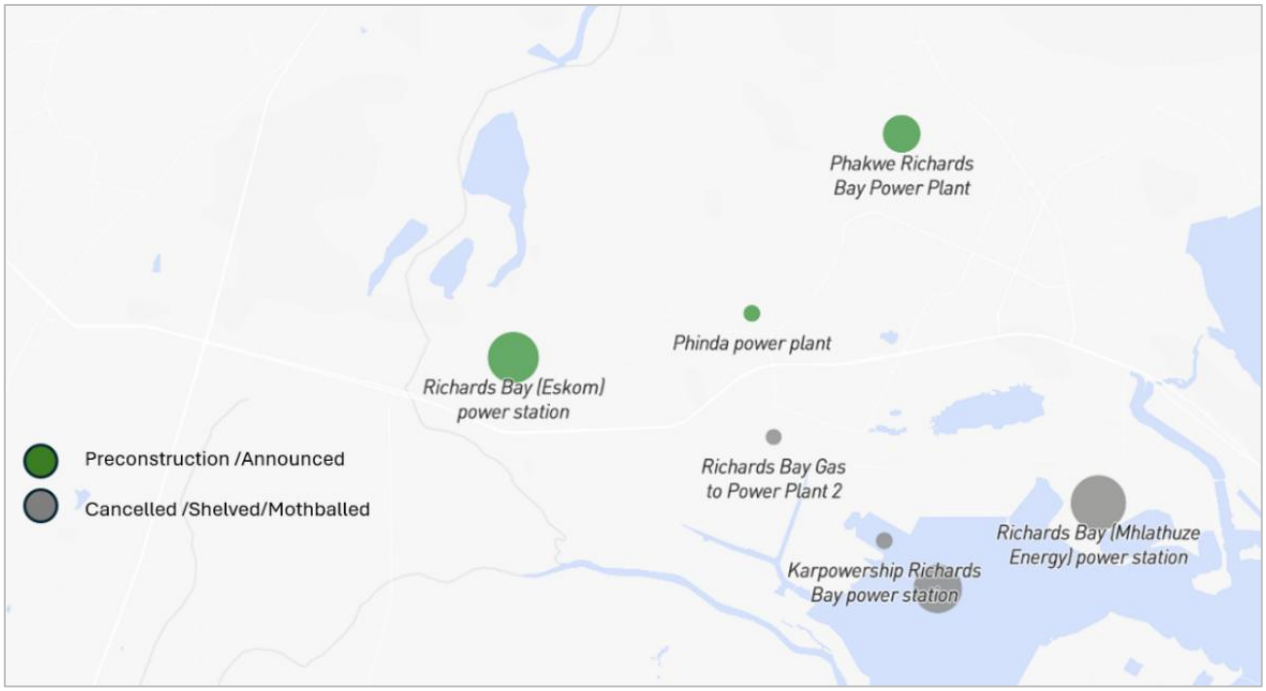

Figure 96: Other Gas to power plant developments near the proposed site (Source: Global Energy Monitor, 2026, as cited in Urban-Econ, 2026)

13.27.3.8.1 Increased Air Pollution and Emissions Burden

Nature: Increased Air Pollution and Emissions Burden
Impact Description: While gas-fired generation is generally cleaner than coal, the cumulative air-quality implications of multiple gas-to-power plants and associated infrastructure in Richards Bay are more significant than the impact of the 750 MW CCPP in isolation. However, when considered cumulatively alongside other gas-to-power facilities, LNG infrastructure, pipelines and existing heavy industry, the situation becomes more complex. Each development contributes incremental emissions (including NO_x, CO, PM and GHGs) to an already burdened airshed, reducing its remaining capacity before ambient standards are exceeded.

Nature: Increased Air Pollution and Emissions Burden

Impacts are likely to be most pronounced among workers and individuals with prolonged exposure in the industrial area, making this primarily a localised occupational health concern rather than a widespread community issue. Cumulative air-quality impacts should also be interpreted through a socio-economic and environmental justice lens, as they may indirectly affect livelihoods and food security in the wider Richards Bay area. In particular, small-scale and subsistence fishers operating in and around the Port of Richards Bay may be affected where deteriorating environmental quality and associated ecosystem pressures influence marine productivity and access to safe harvesting areas. In addition, workers within the industrial area and adjacent zones represent a key at-risk group due to increased occupational exposure to air pollutants, with potential implications for long-term health outcomes and productivity. Households already experiencing energy poverty may also face compounded vulnerability, as broader environmental health burdens interact with limited financial capacity to access cleaner energy, healthcare and adaptive resources, thereby exacerbating existing socio-economic inequalities.

As a result, the cumulative impact is more significant at a regional scale, with potential long-term implications for air quality, increased respiratory health risks for exposed groups and constraints on future industrial development. This requires the need for coordinated planning, strict emissions control and effective regulatory oversight.

	Rating	Motivation	Significance (S=(E+D+M) P)
Before Mitigation/Enhancement			
Duration	Long-term (4)	Cumulative impacts on the airshed likely to persist over time over the life span of the various facilities.	**Medium Negative (60)**
Extent	Regional (3)	Effects extend across the Richards Bay airshed.	
Magnitude	High (8)	Combined emissions contribute to an already burdened airshed, reducing remaining capacity and increasing health risk exposure.	
Probability	Highly Probable (4)	Cumulative impacts are expected given the concentration of existing industrial activities and planned CCGPs.	
Mitigation/Enhancement Measures			
• Implement best-practice emission control measures and ensure strict adherence to regulatory limits and monitoring requirements. • Incorporate air-quality risks into the occupational health and safety management system. • Monitor air-quality and odour-related complaints and implement appropriate investigation and corrective actions where necessary.			
Post Mitigation/Enhancement Measures			
Duration	Long-term (4)	Unchanged as the mitigation measures do not influence this aspect of the impact.	**Medium Negative (52)**
Extent	Regional (3)	Unchanged as the mitigation measures do not influence this aspect of the impact.	
Magnitude	Moderate (6)	Reduced cumulative burden due to coordinated controls and improved emission performance.	
Probability	Highly Probable (4)	Unchanged as the mitigation measures do not influence this aspect of the impact.	

13.27.3.8.2 Enhancement of Regional Energy Supply Infrastructure

Nature: Enhancement of Regional Energy Supply Infrastructure

Impact Description: From a cumulative socio-economic perspective, the CCPP's primary contribution is to improve energy stability and it also contributes to the viability of an emerging gas hub in Richards Bay. By anchoring long-term demand for imported LNG and associated pipeline capacity, the plant supports investment in shared gas and grid infrastructure, improving supply reliability and flexibility for gas-dependent industries. The spatial clustering of facilities around the Port of Richards Bay and the RBIDZ further enhances efficiencies through shared import, storage and transmission infrastructure, reducing costs and improving energy system performance. If implemented in a coordinated manner, the cumulative effect is likely to be a more reliable and resilient regional energy system, with potential reductions in load-shedding, enhanced energy security for industry and a more stable gas supply. These outcomes would support economic growth, industrial output and investor confidence, strengthening Richards Bay's role as a strategic energy hub.

However, the concentration of gas-based infrastructure also introduces longer-term risks, including dependence on imported gas and exposure to price, currency and climate policy uncertainties. The overall cumulative impact is therefore positive but conditional, dependent on integration within South Africa's broader energy transition, effective cost management and a gradual shift toward lower-carbon energy sources to avoid long-term carbon lock-in.

Nature: Enhancement of Regional Energy Supply Infrastructure			
	Rating	**Motivation**	**Significance (S=(E+D+M) P)**
Before Mitigation/Enhancement			
Duration	Long term (4)	Benefits accrue over the long term as supporting gas and energy infrastructure matures.	**High Positive (64)**
Extent	National (4)	Impact extends beyond the local area, contributing to national energy security and system stability	
Magnitude	High (8)	High economic and energy-system benefits through improved reliability, industrial support and multiplier effects.	
Probability	Highly Probable (4)	Realisation of benefits depends on coordinated development of related gas infrastructure and sustained demand, making the impact highly likely but not guaranteed.	
Mitigation/Enhancement Measures			
Enhancement: • Align with national energy-transition and climate policy. • Where possible, maximise shared-use infrastructure such as shared import, storage and pipeline capacity.			
Post Mitigation/Enhancement Measures			
Duration	Long term (4)	Unchanged as the enhancement measures do not influence this aspect of the impact.	**High Positive (64)**
Extent	National (4)	Unchanged as the mitigation measures do not influence this aspect of the impact.	
Magnitude	High (8)	While enhancement measures improve system integration and operational efficiency, the scale of the benefit cannot be significantly increased beyond a certain threshold by the enhancement measures.	
Probability	Highly probable (4)	Unchanged as the enhancement measures do not influence this aspect of the impact.	

13.27.3.9 Traffic

A Traffic Impact Assessment for the broader Phase 1F development of the RBIDZ was previously undertaken in 2013, which was updated in 2024 (see Section 12.15 above). The assessment evaluated the existing road network, projected traffic growth associated with industrial development within Phase 1F, and identified road infrastructure upgrades required to accommodate future development within the precinct.

According to Zutari (van Tonder, personal communication 2026), cumulative traffic impacts were considered during the updating of the Traffic Impact Assessment by taking into consideration the following:

- ❑ Existing background traffic;
- ❑ Latent rights (land with rights that have not yet been developed or existing expansions that have not yet been completed); and
- ❑ 5 year forecast horizon taking into account natural traffic growth.

The above traffic was considered for the operational phase, and not for construction.

13.27.4 Cumulative Environmental Impact Statement

The proposed 750 MW CCGT Power Plant is located within Phase 1F of the RBIDZ, an area that has already been earmarked and approved for industrial development and which forms part of a broader industrial and port expansion node associated with the PoRB. The cumulative impact

assessment considered the existing industrial environment, other authorised and planned developments within the RBIDZ and port precinct, as well as the potential additive effects of the Project on environmental and socio-economic receptors.

The assessment identified that the most relevant cumulative impacts are associated with air emissions (including GHGs), industrialisation and habitat transformation, increased demand on water resources and services, traffic associated with construction and operation, visual intrusion, noise, and risks associated with hazardous materials. Positive cumulative impacts include enhanced energy security, support for national energy transition objectives, stimulation of regional economic growth, increased employment opportunities, and reinforcement of Richards Bay's role as a strategic industrial and logistics hub.

Importantly, the Project is proposed on land that has previously been authorised for industrial development as part of the Phase 1F RBIDZ expansion, including the historical approval for vegetation clearance and wetland infilling. The development will therefore occur within a landscape already designated and planned for industrial use, limiting the extent of additional cumulative transformation of natural habitat. Furthermore, specialist studies indicate that the identified cumulative impacts can be appropriately managed through the implementation of the recommended mitigation measures, adherence to the EMPr, environmental monitoring, and compliance with applicable authorisations and permits.

While certain cumulative impacts, particularly those related to atmospheric emissions and climate change, will remain as residual impacts that cannot be entirely avoided, these impacts were not considered by the specialists to be of a magnitude that would preclude development of the Project.

14 PUBLIC PARTICIPATION

14.1 Introduction

The purpose of public participation includes the following:

- To provide I&APs with an opportunity to obtain information about the Project;
- To allow I&APs to express their views, issues, and concerns with regard to the Project;
- To grant I&APs an opportunity to recommend measures to avoid or reduce adverse impacts and enhance positive impacts associated with the Project; and
- To enable the Applicant to incorporate the needs, concerns, and recommendations of I&APs into the Project, where feasible.

The public participation process that is being undertaken is governed by NEMA and the EIA Regulations. Figure 97 below outlines the public participation process for the Scoping Phase (completed) and EIA Phase (current).

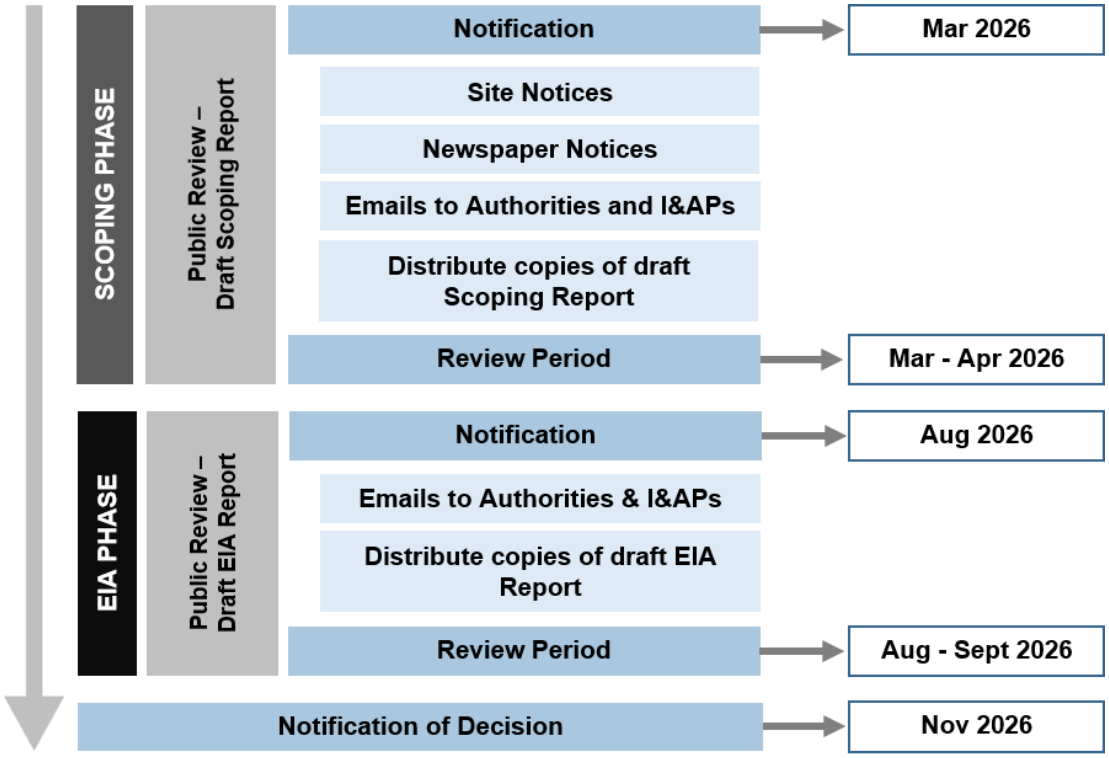

Figure 97: Outline of Public Participation Process

14.2 Public Participation during the Scoping Phase

The primary tasks undertaken as part of public participation during the Scoping Phases included the following (details provided in the final Scoping Report):

- Compiling a database of organs of state and I&APs;

- ❑ Issuing notifications by publishing notices in newspapers, erecting site notices, and distributing emails to all individuals included in the stakeholder database;
- ❑ Lodging the Draft Scoping Report for public review; and
- ❑ Compiling and maintaining a CRR (contained in **Appendix K5**).

14.3 Public Participation during the EIA Phase

14.3.1 Maintenance of the Stakeholders' Database

The database of I&APs (contained in **Appendix H**), which includes authorities, different spheres of government (national, provincial and local), parastatals, stakeholders, interest groups, members of the general public and the Ward Councillor, is being maintained during the EIA phase.

14.3.2 Period to Review the Draft EIA Report

In accordance with Regulation 43(1) of the EIA Regulations, organs of state and I&APs were granted an opportunity to review and comment on the Draft EIA Report from 6 August until 7 September 2026.

14.3.3 Notification of Review of Draft EIA Report

Organs of state and I&APs contained in the database (refer to **Appendix H**) were notified of the review of the Draft EIA Report via email (see proof in **Appendix K1**).

14.3.4 Accessing the Draft EIA Report

The Draft EIA Report was made available as follows:

- ❑ Hardcopies were placed at the following libraries –
  - Richards Bay Library (2 Krugerrand Grove, Richards Bay);
  - Aquadene Public Library (4 Via Ammannia, Aquadene, Richards Bay);
  - Nseleni Library (next to Municipal Office in Ubhejane Street, Nseleni); and
  - Mzingazi Library (next to Mzingazi Primary school, Rbm Road, Meerensee).
- ❑ An electronic copy was uploaded to the following website, for downloading purposes: https://nemai.co.za/downloads/.

14.3.5 Comments Received on the Draft EIA Report

Copies of the comments received on the Draft EIA Report are contained in **Appendix K2**. These comments were incorporated into the CRR (contained in **Appendix K5**), which also includes responses from the Applicant, technical team, EAP and environmental specialists (as relevant).

14.3.6 Public Meetings to Present the Draft EIA Report

The meetings that were held to present the Draft EIA Report are listed in Table 95 below. The minutes of the meetings are contained in **Appendix K3** and **Appendix K4**.

Table 95: Meetings held to present the Draft EIA Report

	Date	Time	Venue
Virtual Meeting	25 August 2026 (Tuesday)	11:00 to 13:00	Virtual Platform (MS Teams)
Physical Public Meeting	26 August 2026 (Wednesday)	17:30 to 20:00	Zululand Chamber of Commerce Community Park, Guldengracth, Alton, Richards Bay
Physical Community Meeting	27 August 2026 (Thursday)	09:00 to 11:30	Nseleni Community Hall

15 CONCLUSIONS & RECOMMENDATIONS

15.1 Outcomes of the EIA Phase

The following key tasks were undertaken during the EIA phase for the proposed Project:

- The specialist studies identified in the Plan of Study for the EIA were undertaken and the findings were incorporated into the EIA Report in terms of understanding the environmental status quo and sensitive features, assessing the potential impacts and establishing concomitant mitigation measures.
- Potentially significant impacts pertaining to the pre-construction, construction and operational phases of the Project were identified and assessed, and mitigation measures were provided.
- Alternatives for achieving the objectives of the proposed activity were considered, and the preferred options were identified.

The outcomes of these tasks are captured below.

15.2 Sensitive Environmental Features

The following sensitive environmental features associated with the Project's receiving environment are highlighted, for which mitigation measures are included in the EIA Report and EMPr:

- Surface water –
  - Although there are no recognised streams near the site, a stormwater canal runs parallel to the western side of the site, which conveys stormwater from the RBIDZ in a south-westerly direction to a non-perennial stream (Mhlangabezani stream) about 3.7 km downstream of the site.
  - Much of the hydrology of the area is linked with the shallow water table of the coastal plain.
  - Two wetlands were delineated on the site, namely a seep wetland and wetland flat. *It is noted that various wetlands were infilled in the RBIDZ Phase 1F to allow for the development on these portions of land within the industrial estate, under the requisite approvals in terms of NEMA and NWA. A wetland (known as remainder of Wetland B) remains to the south-west of the site*.
  - Due to the flood risk posed to the project infrastructure, further flood modelling work is considered necessary and would require more detailed topographical data.
- Groundwater –
  - The project area overlies a coastal aquifer and shallow groundwater is encountered on the sites.
  - During high rainfall periods, a rebound of the perched water table usually occurs with shallow excavations and topographical depressions becoming waterlogged for extended periods.

- The project area is situated in both the Richards Bay ground water-fed estuary SWSA and the Zululand Coast surface water.

- Geotechnical constraints are encountered at the site, including a shallow perched water table, permeable and compressible sandy soils, low bearing capacity, unstable excavations, and the absence of a competent shallow founding horizon.
- Terrestrial biodiversity –
  - The site encroaches into areas designated as CBA Irreplaceable in terms of the KZN BP. In addition, the site is located within the Maputaland Wooded Grassland vegetation type, which is classified as Endangered. Despite this high conservation context at a regional scale, field verification indicates that the study area has been subject to varying degrees of historical disturbance.
  - Four primary habitat units were identified on the site, namely Degraded Hygrophilous Grassland, Thicket Habitat, Freshwater Habitat (wetland flats and seep systems), and Transformed Habitat.
  - Overall, while portions of the study area retain moderate ecological value, particularly within freshwater-associated habitats, the site is characterised by disturbance, fragmentation, and reduced connectivity.
- Ambient air quality –
  - Richards Bay is an existing industrial airshed with cumulative emissions from numerous industries.
- Climate –
  - The site is located within an established industrial area in Richards Bay, where the main climate-related risks include increasing temperatures, extreme rainfall, localised flooding, and disruption to upstream infrastructure and logistics during severe storm events. The Project site is not expected to be directly affected by sea-level rise over its operational life, although indirect exposure remains relevant through reliance on port and fuel-supply infrastructure. HILP events, including severe coastal storms, cut-off low systems with subtropical characteristics, and tropical cyclones, are also relevant in the regional context and may have disproportionate consequences despite their low probability. These risks are not considered, in themselves, to preclude the proposed development.
- Visual environment –
  - Sensitive visual receptors include nearby residential areas, motorists, and visitors to nearby protected areas, although vegetation, terrain and existing industrial development substantially reduce visual exposure.
- Noise environment –
  - Existing residential areas and community facilities constitute sensitive noise receptors.
- Richards Bay Estuary –
  - At its closest point, the site is located approximately 2.6 km to the south of the EFZ of the Richards Bay Estuary. Although outside the immediate footprint, the estuarine environment is an important regional ecological receptor that could be indirectly affected by project-related impacts.

- Protected areas –
  - Nearby protected areas include Enseleni Nature Reserve (approximately 5.2 km to the north-west) and Richards Bay Game Reserve (approximately 6.1 km to the south), which represent regional ecological receptors.
  - The site falls within a NPAES Priority Focus Area. However, this designation should be considered in the context of the proposed development being located within RBIDZ, a formally designated SEZ that has been earmarked for industrial development.
- Socio-economic environment –
  - Sensitive receptors from a socio-economic perspective include the neighbouring industries and operations within the RBIDZ, businesses in Alton industrial area, residential areas, Richards Bay CBD, public amenities, PoRB, transport infrastructure (road and rail), and ZET gas distribution supply take-off point.
- Existing services and infrastructure –
  - Water and sewer pipelines, as well as the tarred access road, run along the western boundary of the site. In addition, a stormwater canal also runs parallel to the western side of the site. There are no existing registered servitudes on the site.

A sensitivity map in terms of freshwater ecosystems and terrestrial biodiversity is provided in Figure 98 below. It is important to recognise that the wetlands on the site were previously assessed as part of the RBIDZ Phase 1F environmental authorisation process, during which the clearance of indigenous vegetation and the infilling of wetlands within the authorised development footprint were approved. Consequently, the current EIA for the proposed Plant does not seek approval for wetland-related impacts on the site, nor does it re-assess the acceptability of the previously authorised habitat transformation and wetland infilling. Rather, the current assessment has focused on the environmental impacts specifically associated with the construction and operation of the proposed Power Plant and associated infrastructure within an already authorised industrial development footprint.

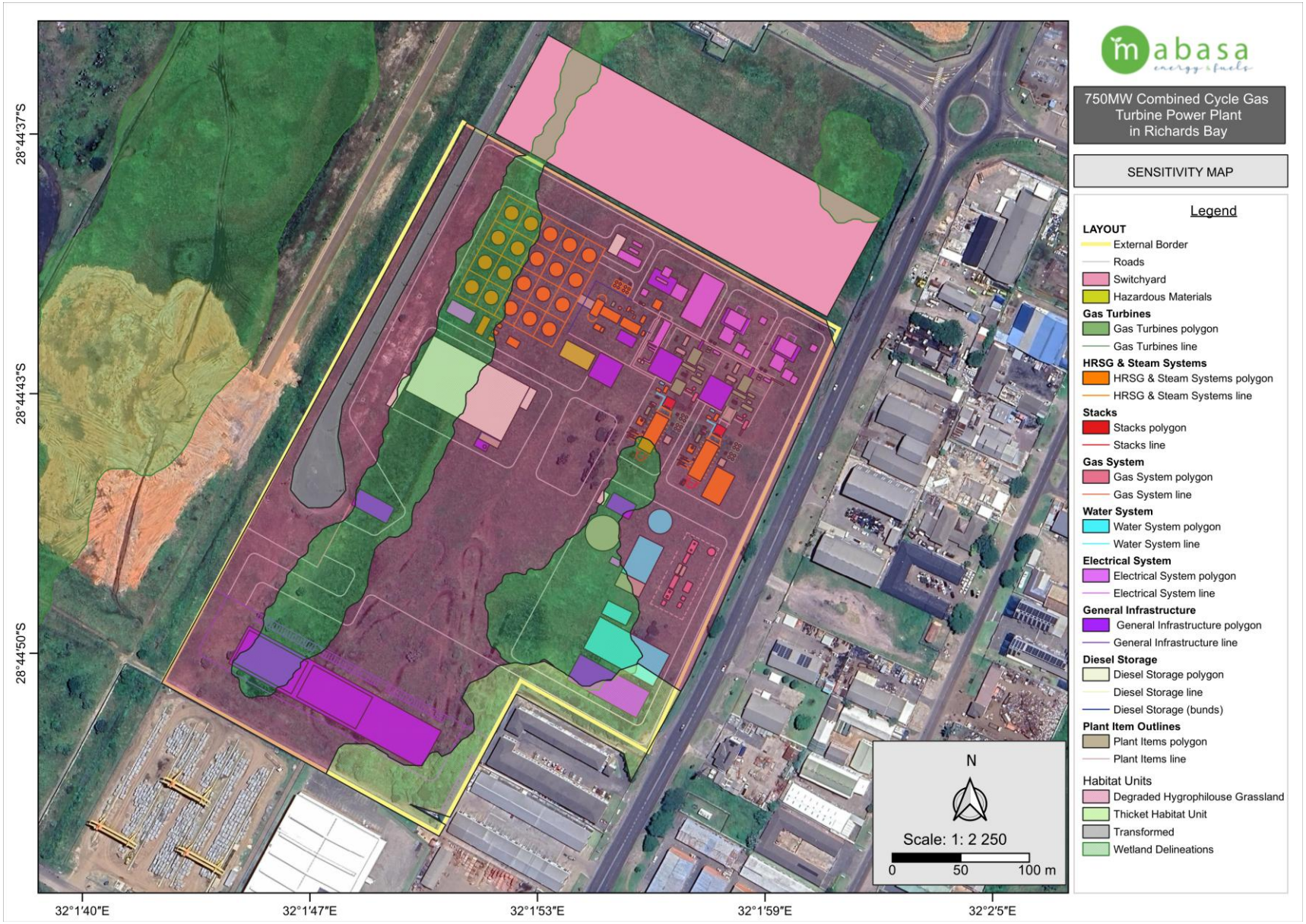

Figure 98: Combined sensitivity map (freshwater ecosystems and terrestrial biodiversity)

15.3 Environmental Impact Statement

The EIA undertaken for the proposed 750 MW CCGT Power Plant within the RBIDZ identified a range of potential biophysical and socio-economic impacts associated with the pre-construction, construction and operational phases of the Project. The assessment incorporated the findings of the specialist studies, the outcomes of the public participation process to date, the consideration of alternatives, and the implementation of mitigation measures contained in the EMPr.

The assessment confirmed that the Project will result in certain unavoidable residual impacts, including the loss of transformed terrestrial habitat and wetlands (for which vegetation clearance and wetland infilling was previously authorised), GHG gas emissions, incremental contributions to regional air quality impacts, and increased demand for water. However, the majority of identified impacts are localised, can be reduced through the implementation of appropriate mitigation measures, and are not considered to constitute fatal flaws that would preclude development of the proposed facility.

The Project is located within an established industrial setting and SEZ where industrial development is anticipated and supported by existing planning frameworks. The Project is also expected to provide positive socio-economic benefits, including improved energy security, contribution towards national electricity generation capacity, employment creation, skills development opportunities, and stimulation of the regional economy.

On balance, given the Project's alignment with national energy policy, its site-specific advantages within the RBIDZ, and the absence of any identified fatal flaws, the no-go alternative is not considered the preferred option.

Based on the findings of the specialist studies and the outcomes of the EIA, it is concluded that Environmental Authorisation may be granted for the Project, provided that all identified environmental management measures are implemented and complied with. It is further the opinion of the EAP and EIA team that the EIA was executed in an objective manner and that the process and EIA Report conform to the requirements stipulated in the EIA Regulations. The period for which the Environmental Authorisation is required is 10 years.

15.4 Recommendations

The following key recommendations, which may also influence the conditions of the Environmental Authorisation (if granted), are highlighted:

- The final engineering design must incorporate climate-resilient infrastructure measures, including flood management provisions, stormwater controls and emergency response measures, taking into account projected future climate conditions and extreme weather events.

- GHG emissions must be monitored and reported in accordance with applicable legislative requirements.
- Emissions must be strictly controlled in accordance with AEL requirements, with continuous monitoring and operational optimisation to ensure that the Project does not contribute disproportionately to cumulative exceedance conditions.
- Prior to finalisation of the detailed engineering design, a detailed flood modelling assessment, informed by site-specific topographical survey data, should be undertaken to confirm flood risk to project infrastructure and to inform appropriate flood mitigation and stormwater management measures.
- A detailed Stormwater Management Plan needs to be compiled for the Plant during the detailed design phase, which will need to be submitted to DFFE to approval prior to construction.
- Monitoring and maintenance programmes must be implemented to ensure the ongoing performance of stormwater and pollution-control infrastructure.
- Groundwater monitoring must be carried out throughout the operational life of the plant from wells situated hydraulically up-gradient from and down-gradient of operational areas to monitor any potential cumulative impacts associated with the facility.
- Appropriate noise attenuation measures should be incorporated into the final plant design to ensure compliance with applicable noise standards, as necessary.
- The facility must be designed, constructed and operated in accordance with all applicable statutory requirements, SANS standards, recognised international codes of practice and process safety management principles. Prior to construction, a recognised process hazard analysis (e.g. HAZOP, FMEA or equivalent) must be undertaken and all final engineering designs must be certified by suitably registered Professional Engineers. The final design shall demonstrate that risks have been reduced to internationally acceptable levels through the incorporation of appropriate safety, control and protection systems, including compliance with applicable functional safety standards. A final Major Hazard Installation (MHI) Risk Assessment, based on the detailed engineering design and incorporating all engineered mitigation measures, must be completed and accepted by the relevant regulatory authorities prior to commissioning of the facility.
- The Project must operate within the capacity of the receiving environment, recognising that baseline conditions are already stressed. Monitoring data must be interpreted in a cumulative context, and operational adjustments must be made where necessary.
- Effective traffic management measures must be implemented to minimise accident risk, particularly during construction and at interfaces with public road networks.
- A comprehensive Occupational Health and Safety System must be maintained to manage exposure to noise, heat, hazardous materials and confined space conditions.
- Programmes must be implemented to address labour influx, service pressure, health awareness (including HIV/STIs) and equitable distribution of project benefits.
- All waste generated during construction and operation must be managed in accordance with the waste hierarchy and disposed of at appropriately licensed facilities.

- Any material deviation from the assessed project design must be subject to further environmental review and approval where required.

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APPENDICES