

553652

15 March 2021

DEFF ref: 14/12/16/3/3/2/2013



Executive Summary

Proposed Coega Integrated Gas-to-Power Project: Gas Infrastructure

Draft Environmental Impact Report

1. Introduction

The Coega Development Corporation (CDC) proposes to develop a gas to power project, including three power plants and associated infrastructure, within the Coega Special Economic Zone (SEZ) (See Figure 2). SRK Consulting (South Africa) (Pty) Ltd (SRK) has been appointed by CDC, as the independent environmental consultants to assess the environmental impacts of the proposed development according in terms of the National Environmental Management Act 107 of 1998 (NEMA) 2014 Environmental Impact Assessment (EIA) Regulations.

The overall project would broadly involve the following components:

- A Liquefied Natural Gas (LNG) terminal, consisting of a berth with off-loading arms within the Port of Ngqura, cryogenic pipelines, storage and handling facilities and re-gasification modules (both on and off-shore);
- Gas pipelines and distribution hub, for the transmission, distribution and reticulation of natural gas within the Coega SEZ and Port of Ngqura;
- Three Gas to Power plants, each with a 1000 MW generation capacity (specific generation technologies may vary); and
- Electricity transmission connecting powerlines to evacuate electricity to the previously approved 400 kV lines in the SEZ

A total power generation capacity of up to 3000 MW will therefore be available once the full extent of the project has

been developed (which may be spread over a number of phases) the timing of which is unknown at this stage and is dependent on the CDC securing successful bidders for each component of the development

Due the size of the proposed project, in accordance the NEMA 2014 EIA regulations the proponent needs to apply for environmental authorisation from the Department of Environment, Forestry and Fisheries (DEFF) via a Scoping and Environmental Impact Assessment (S&EIA) process. Four separate EIA applications are being lodged of the project (each of the three power plants and one for the gas infrastructure), each associated with a separate EIA process. This approach allows for the transfer of discrete projects and associated authorisations to developers following a bidding process.

As developers and their chosen technologies have not yet been identified, various technologically feasible options are applied for in each EIA, and the assessment presented will be based on the worst-case option for each impact. The aim of this approach is to identify the envelope limits within which the project impacts will fall, and which will be acceptable to the receiving environment with implementation of mitigation measures where relevant.

The four EIA process being undertaken, and running parallel, are described as follows:

1. **Gas Infrastructure 1 (the subject of this report) consisting of the LNG terminal port infrastructure up to two Floating Storage and Regasification Units (FSRUs), Gas and LNG pipelines, an onshore storage and regasification unit (once gas demand reaches the level where the FSRU is no longer feasible) and a gas distribution hub.** The proposed

infrastructure assessed will support all three Gas to Power plants, should they be developed, as well as provide gas and LNG for third party off takers;

2. Zone 13 comprises the 1000 MW power plant in Zone 13 of the Coega SEZ;
3. Zone 10 South comprises the southern-most 1000 MW power plant in Zone 10 of the Coega SEZ; and
4. Zone 10 North comprises the northern-most 1000 MW power plant in Zone 10 of the Coega SEZ.

On 9 October 2020, an application to commence the current EIA process was submitted to the DEFF, signalling commencement of the EIA process.

2. Approach to the Study

The proposed development is subject to environmental authorisation from DEFF in terms of the National Environmental Management Act of 1998. As such, an EIA is required and this Draft Environmental Impact Assessment Report (Draft EIR) presents an important milestone in the EIA process. An overview of the EIA process is provided in Figure 1.

The first phase of the EIA, the Scoping Study, has been completed, and included a Public Participation Process (PPP), aimed at identifying issues and concerns of interested and Affected Parties (IAPs). The objective of the Scoping Study was to identify those issues and concerns that must be investigated in more detail, and included a Plan of Study for the EIA, which, along with the Final Scoping Report (FSR) was approved by DEFF on 6 January 2021.

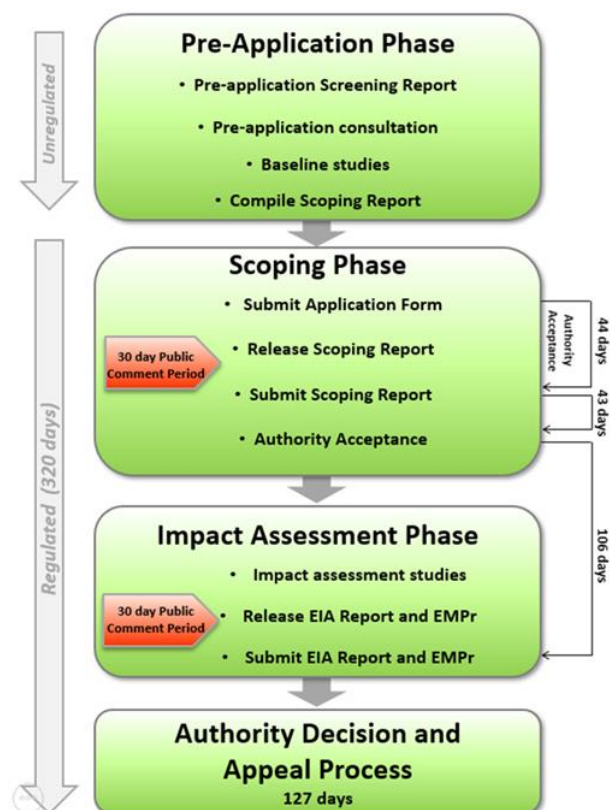


Figure 1: Flow diagram of the S&EIA Process

The second phase of the EIA commences with the Draft Environmental Impact Report (this report). The aim of this report is to present the results of investigations of the issues and concerns identified in the Scoping Study, identify and assess the potential impacts of the development and provide recommendations with the objective of minimising negative environmental impacts and maximising benefits.

The following activities have been done as part of the DEIR in accordance with the requirements of the NEMA EIA regulations:

- Completion of specialist studies, as per the terms of reference included in the Plan of study for EIA in the Scoping Report and additional requirements of DEFF;
- Compilation of this Draft EIR.

Details of the specialist studies that were completed as part of the EIR are provided in Table 1, and copies of the specialist study reports are included as Appendix K of the Draft EIR.

Table 1: List of Specialist Studies

Specialist	Study	Appendix
Dr Mark Zunckel, Umoya-Nilu	Air Quality Impact Assessment	K1
Mike Oberholzer, Riscom	Quantitative Risk Assessment	K2
Karien Erasmus, Promethium Carbon	Climate Change Impact Assessment	K3
Dr Brett Williams, Safetech	Noise Impact Assessment	K4
Cary Hastie, EAS	Traffic Impact Assessment	K5
Andrea Pulfrich, Pisces Environmental Services	Marine Impact Assessment	K6

3. Development Proposal

The proposed gas infrastructure will consist of all key supporting infrastructure required for the operation of the CDC's proposed gas to power plants in the Coega SEZ (Figure 2). This will be made up specifically of infrastructure for the import, storage and transmission of LNG via the Port of Ngqura, to the various power plants, and seawater for cooling of zone 10 power plants (should they be seawater cooled). Additional capacity of supply of LNG and natural gas (NG) to third party off takers, potentially including the Dedisa peaking power plant, should this be converted to gas, will also be included. The key infrastructure includes the following:

- Up to two floating storage and regasification units (FSRU), moored in the Port, which will receive, store and regasify the LNG from the LNG carrier (LNGC). This will be phase 1 of the project. It is proposed that onshore storage and regasification facilities will replace the FSRUs once the demand for NG reaches a point where onshore storage and regasification is the more feasible option, at which point the FSRU will be removed;

- A new jetty with offloading platform and berthing facilities for the FSRU and LNGC in the port of Ngqura;
- A trestle structure to support the gas and cryogenic pipelines running within the port from the offloading platform parallel to the eastern breakwater, to the point where the pipelines will cross under the breakwater near the admin craft basin, thereafter running underground;
- An LNG and gas hub, consisting of storage and regasification facilities (for development in phase 2, once the FSRU is no longer the most feasible option), and a truck delivery centre for third party off-takers. Gas metering, admin, control rooms, workshops, and vents will be included in the LNG and gas hub;
- Gas (for transmission of NG) and cryogenic (for transmission of LNG) pipelines from the FSRU and jetty to the three proposed power plants, as well as the boundary of the Dedisa power plant in Zone 13;
- Pipelines for the transmission of seawater from the abstraction point in the port, to the zone 10 power plants (if seawater cooled) and regasification plant at the LNG and gas hub in Zone 10.
- The predicted air quality impact, mainly associated with increased emissions of SO₂, NO₂, CO and PM₁₀ during operation, affecting ambient concentrations of these pollutants, potentially affecting nearby receptors and the surrounding natural environment, is rated as insignificant due to the relatively minor contribution of the proposed gas infrastructure to ambient concentrations, which show exceedances in some instances.
- The predicted impact of the power plant on climate change, by way of increased greenhouse gas emissions, is rated as very high significance due to the large amounts of CO₂ emitted by burning of natural gas. While this is significantly less than what would be emitted from burning of coal and significantly more than emitted by renewables, the contribution to GHG emissions will be substantial.
- The predicted impact of climate change on the project, by way of vulnerability or resilience to extreme weather events, is predicted to be very low. It is noted however that due to its unpredictability this risk is difficult to rate and should not be seen as unimportant.
- The predicted safety risks to surrounding receptors, in the unlikely event of a catastrophic event due to loss of containment of LNG from the LNGC, FSRU, onshore storage tanks, pipelines, etc., are predicted to be of medium significance (Phase 1) and very low (Phase 2) during operation.
- The predicted marine ecological impacts resulting mainly from the construction phase and operation of Phase 1 of the project (involving the use of FSRU(s)), are largely rated as very low significance, assuming adequate mitigation. Key impacts that would need to be mitigated include noise disturbance associated with pile driving etc. during construction; impingement and entrainment of marine organisms during intake of water by the LNGC and FSRU for ballasting and heating and cooling; introduction and spread of non-native species through hull fouling or ballast water discharge by the LNGC and FSRU; and the unexpected release of diesel from a vessel at sea).
- The predicted terrestrial ecological impacts of a localised loss / change of floral and faunal habitat from physical disturbance, vegetation clearing, and increased human activities in the area, are rated to be of low or very low significance. The predicted impact on the nearby Damara tern colony, primarily due to disturbance, is however rated to be of high significance. No-go areas have been identified and search and rescue permits will be required for protected fauna and flora within the site footprint area.
- The predicted socio-economic benefit of job creation, increased revenue to government, economic investment during construction are rated as medium - low (+ve) significance, and during operation, with the additional benefit of increased energy security, medium to high (+ve) significance.
- The predicted visual impacts of altered sense of place and visual intrusion are rated as low significance due to the visibility of the gas infrastructure and

4. Public Participation Process

A Public Participation Process (PPP) aimed at allowing the public to be involved in the environmental process is being carried out.

The following PPP activities that are to take place as part of the Environmental Impact Assessment Process:

- Making the Draft EIR available for download on the SRK 'Public Documents' webpage, as well as the distribution of an executive summary to all registered IAPs, and a provision of a 30 day comment period;
- Responding to all comments received on the Draft EIR by means of a comments and response table in the Final EIR, and where required making amendments in the EIR to accurately reflect responses;
- Submission of the FEIR to the DEFF for a decision, and notifying all registered IAPs of the submission and the responses to comments received;
- Notifying all registered IAPs of the DEFF's decision and the appeals process.

A summary of comments and responses raised by IAPs and stakeholders to date as part of the EIA process is provided in Appendix H of the Draft EIR.

5. Findings and conclusions

The impact significance ratings for the various impacts that were identified, both before and after application of mitigation (for negative impacts) or enhancement (for positive impacts) are summarised in Table 3. Key observations with regard to the overall impact ratings, assuming mitigation measures are effectively implemented, are highlighted as follows:

persistence of impacts in the (very) long term, but noting the absence of sensitive receptors locally.

- The predicted traffic impact during construction and operation is rated as very low due to the SEZ roads being designed for large volumes of industrial type traffic.
- The predicted noise impact due to construction and operation of the power plant is rated as very low due to the development being located in an industrial area and limited noise sensitive receptors being present in the surrounding area, provided impacts on the nearby Damara tern colony can be adequately mitigated.
- The predicted heritage impact of a loss of or damage to heritage remains that may be uncovered during construction is rated as low. A chance finds procedure will be in place for the unexpected event of heritage resources being found.
- Impacts relating to pollution of soils, stormwater and erosion due to leaks or spills of pollutants, or unmanaged stormwater during construction and operation are rated as of low significance, with adequate stormwater control measures in place.
- General construction related impacts, such as dust nuisance, fire risks, and damage to other infrastructure are rated as very low to insignificant, and will generally be of short duration.
- The No-Go alternative entails no development of the site and the current situation continuing with regard to biophysical and socio-economic impacts. No impact rating is therefore provided for the no-go alternative.
- Cumulative impacts mainly derive from existing industries in the area, contributing to baseline concentrations of atmospheric pollutants, as well as proposed similar gas to power developments in the SEZ area. In the context of the project, cumulative impacts relating to noise and safety risk are rated as medium significance, terrestrial ecology (specifically the Danara tern colony) high, while those relating to traffic and air quality are rated as very low to insignificant. The cumulative socio-economic benefits of job creation, local and regional economic growth, and increased energy security are considered to be of medium to high significance.

The fundamental decision is whether to allow the development and the operation of the Gas Infrastructure, which is consistent with development policies for the area, but which may have significant climate change impacts in terms of greenhouse gas emissions, and possibly contribute to the localised extinction of the Damara tern colony, should the level of disturbance be found to be incompatible with their continued occupation.

In conclusion SRK is of the opinion that on purely 'environmental' grounds (i.e. the project's potential socio-economic and biophysical implications) the application as it is currently articulated should be approved, provided the essential mitigation measures are implemented. Ultimately, however, the DEFF will need to consider whether the project benefits outweigh the potential impacts.

6. Key Recommendations

The specific recommended mitigation and optimisation measures are presented in the Draft EMPr (Appendix L of the DEIR). The CDC would need to implement these mitigation measures to demonstrate compliance with the various authorisations (should they be granted).

Key recommendations, which are considered essential, are:

1. Implementation of the EMPr to guide construction and operations activities and to provide a framework for the ongoing assessment of environmental performance;
2. Implementation of the CDC Standard Environmental and Standard Vegetation Specifications for Construction (CDC, 2005), and any other relevant CDC guidelines / specifications for design (architecture), construction, and revegetation;
3. Ensure the relevant permits (e.g. for search and rescue of protected vegetation, damage to protected trees, Provisional Atmospheric Emissions Licence) are in place prior to commencement of construction;
4. Demarcate all identified no-go areas, including stipulated buffers, to prevent access / disturbance during both construction and operation;
5. The implementation of a chance finds procedure as outlined in the EMPr, specifying the actions to be taken in the event of discovery of any heritage materials during vegetation clearing and construction;
6. Design and implementation of a site specific stormwater management plan that aligns with the CDC's Stormwater Master Plan for the SEZ;
7. Any water required for construction related activities should be sourced from non-potable sources (e.g. return effluent) where possible;
8. A revegetation plan must be compiled by a suitably qualified specialist and implemented to stabilise and rehabilitate dune vegetation that is disturbed during construction;
9. An alien invasive plant management plan must be compiled and implemented in all areas disturbed during construction;
10. A waste management plan should be in place and should address classification of waste streams, segregation at source, control of waste on site before disposal, removal of wastes from site, and record keeping;
11. Traffic management measures during construction:
 - a. Provide suitable traffic accommodation measures as part of construction contract to inform other road users of presence of construction related traffic;
 - b. Traffic accommodation measures to be provided in terms of Chapter 13 of the South African Road Traffic Signs Manual;
 - c. Measures to be provided subject to approval by the Engineer;

- d. Ensure construction traffic is confined to site area where possible.
 - e. Ensure that vehicle loads are within legislated limits, i.e. maximum Gross vehicle mass of 56 000kg;
 - f. Source relevant permits from the Eastern Cape Department of Transport should abnormal loads be required for transport of components;
 - g. Increased law enforcement protocols along access roads;
 - h. Suitable warning traffic signage be provided to ensure safe operation along Ring Road.
12. Noise mitigation measures before and during construction and operation:
- a. All construction operations should only occur during daylight hours if possible;
 - b. Construction related piling should only occur during the day to take advantage of unstable atmospheric conditions (which lessen the effects of project related noise).
 - c. Construction staff should receive “noise sensitivity” training such as switching off vehicles when not in use, location of NSA’s etc.
 - d. An ambient noise survey should be conducted at the noise sensitive receptors during the construction phase;
 - e. The noise impact from the proposed Gas Infrastructure should be measured during the operational phase, to ensure that the impact is within the required legal limit.
13. Measures to minimise impacts on the Damara Tern population due to disturbance
- a. CDC to establish a Damara Tern Management Program within the CDC OSMP mechanisms, which incorporates:
 - specialist monitoring of the Damara tern population to determine the extent of their habitat, by an expert with previous experience monitoring this species,
 - an annual report on the status of the SEZ Damara tern population, and approval of the annual report / management plan by the EMC.
 - Continued monitoring of the Damara Tern population must be implemented
 - b. Maintain a No-Go buffer area to ensure no access or activities within 200 m of Damara Tern habitat as indicated on the environmental sensitivity map (Figure 3);
 - c. No-Go buffer areas around the tern breeding area must be demarcated and pedestrian and other access must be prevented both during operation, particularly during the Damara Tern breeding season (early October to late February); and
 - d. Environmental awareness / toolbox talks to include awareness of the Damara tern population;
- e. No fires are permitted within the project area.
 - f. Measures must be taken to minimise noise from machinery etc.
 - g. Drivers of vehicles authorised to drive on the beach must be made aware of the presence of Damara Terns during the breeding season (October to March) and must keep below the high-water mark; and
 - h. Management actions such as litter picking must be carefully planned to minimise disturbance to breeding pairs.
14. Climate Change mitigation measures before and during operation:
- a. Source LNG from nearby suppliers such as northern Mozambique, to reduce upstream transport emissions;
 - b. Source LNG from responsible suppliers, reducing emissions associated with extraction and upstream processing of the LNG.
 - c. Use good quality equipment to reduce the amount of natural gas that escapes as fugitive emissions and reducing the need for flaring
15. Measures to mitigate climate change risk and vulnerability of the project to climate change:
- a. Consider climate change impacts in the engineering design of the gas infrastructure.
 - b. Design of an on-site stormwater drainage system, and implementation of a stormwater management plan.
 - c. The plant equipment and infrastructure must be weather-proofed, specifically in light of the anticipated increase in extreme weather occurrences (severe winds, extreme heat, heavy rains, and flooding impacts). The corrosive nature of maritime climate on infrastructure and equipment must be taken into account in design and maintenance.
 - d. Increase the capacity of the fuel storage tank holding bunds to accommodate excessive rain and include drainage methods to avoid fuel storage tank damage or spillage.
 - e. Improve storm water drainage capacity to minimise flood occurrences onsite and the associated contamination occurrences.
 - f. Use a closed-loop water system for the gas infrastructure to minimise water losses to evaporation, and reduce water consumption.
 - g. Implement disaster management policies and onsite employee training specifically for extreme weather event (including severe winds, extreme heat, and heavy rain and drought) risk management protocols.
16. Installation of instrumentation, including detection and emergency shut down, to mitigate safety risks from catastrophic events during operation. Additional recommendations are made by the QRA specialist, most

- of which are legal requirements / industry standards and therefore are considered to be essential.
17. Measures to minimise impacts on the marine environment during construction and operation of the port infrastructure, FSRU and LNGC:
- a. All dredging activities and associated environmental monitoring must be conducted in accordance with the conditions stipulated under the port expansion authorisation.
 - b. All contractors must have an approved Environmental Management Plan (EMP) in place that ensures that environmental impacts are minimised as far as practicably possible.
 - c. Restrict construction noise and vibration-generating activities to the absolute minimum required.
 - d. Ensure that all pile driving is undertaken in accordance with international protocols (e.g. JNCC 2010; DPTI 2012).
 - e. Consider the use of a bubble curtain to minimise noise impacts from pile driving being transmitted through the sediment into the water.
 - f. Implement a waste management system that addresses all wastes generated at the various sites, shore-based and marine.
 - g. Implement leak detection and repair programmes for valves, flanges, fittings, seals, etc.
 - h. Use a low-toxicity biodegradable detergent for the cleaning of all deck spillages.
 - i. Ensure that vessel speed is kept below 10 knots when underway in Algoa Bay.
 - j. The vessel operators must keep a constant watch for slow-swimming large pelagic fish, marine mammals and turtles in the path of the vessel.
 - k. Ensure that all project-associated vessels have an oil spill contingency plan in place.
 - l. As far as possible, attempt to control and contain any diesel spill at sea with suitable recovery techniques to reduce the spatial and temporal impact of the spill.
 - m. Ensure adequate resources are provided to collect and transport oiled birds to a cleaning station.
 - n. Refuelling is to take place only under controlled conditions within the port.
 - o. Design intakes to minimise entrainment or impingement by reducing the average intake velocity to about 0.1 to 0.15 m/s.
 - p. Optimise operating modes in the open-loop system as far as possible to reduce impacts, or use closed-loop systems whenever practicable.
 - q. Use multi-port discharges and adjust discharge rate to facilitate enhanced mixing with the receiving water body.
 - r. Ports should discharge horizontally or within -45° of horizontal to maximise dilution and avoid erosion of the sediments where the jet hits the seabed.
 - s. The LNGCs must have a Ballast Water Management Plan in place.
 - t. Ballast water exchange must be done 200 nautical miles from the nearest land in waters of at least 200 m deep (the minimum being 50 nautical miles from the nearest land).
 - u. Ensure that routine cleaning of ballast tanks to remove sediments is carried out, where practicable, in mid-ocean or under controlled arrangements in port or dry dock, in accordance with the provisions of the ship's Ballast Water Management Plan.
 - v. Use filtration procedures during loading of ballast to avoid the uptake of potentially harmful aquatic organisms, pathogens and sediment that may contain such organisms.
 - w. Neutralise NaOCl with SMBS prior to discharge to ensure that the most conservative international guideline value (<2 µg/l) for residual chlorine at the point of discharge is met.
 - x. Blend the brine from the onboard desalination plant with the cooling/heating water prior to release.
 - y. Reduce lighting in non-essential areas.
 - z. Use guards to direct lights to areas requiring lighting
 - aa. Avoid direct light in water, except during safety inspections
 - bb. Use low light mounting where possible
 - cc. Prepare an emergency response plan covering recommended measures to prevent and respond to LNG spills.
 - dd. The hypochlorite generation unit on the offloading platform must be suitably banded to prevent and spills from the plant entering the marine environment.
- Monitoring Recommendations highlighted in the Marine assessment are as follows:
1. During pile-driving operations monitoring by Marine Mammal Observers (MMO) and Passive Acoustic Monitoring (PAM) operatives to detect marine mammals must be undertaken;
 2. Engage an acoustic consultant to undertake a site-specific underwater noise assessment.
 3. Undertake an entrainment study to more accurately determine the potential impacts of impingement and entrainment on communities within the Port of Ngqura.
 4. Implement an invasive species monitoring programme both in the harbour and on the St Croix Island Group.

7. The Way Forward

The key activities and the provisional timetable required to achieve the objectives of EIA process are summarised in Table 2 below.

The public participation process so far has given IAPs the opportunity to assist with identification of issues and potential impacts, and further opportunities are provided as indicated below.

*Note that the intention is for the EIAs for the three power plants and associated infrastructure to run concurrently, with separate but similar reports being issued for each project according to the estimated timeframes indicated below. Authorities and IAPs will therefore be provided with four separate reports for review and comment, and must **clearly indicate which of the project(s) their comments relate to.***

This Executive Summary has been distributed to all registered IAPs.

The Draft EIR can also be accessed as an electronic copy on SRK's website <https://docs.srk.co.za/en/za-cdc-coega-3000-mw-gas-power-project-eias>

Written comment on the Draft EIR should be sent to SRK by **midday on 18 April 2021**. Comments must be forwarded to:

Lyndle Naidoo at SRK Consulting
 PO Box 21842, Port Elizabeth, 6000
 Email: L.Naidoo@srk.co.za
 Fax: (041) 509 4850

Table 2: Activities and Timetable

Stage / Activity	Target Dates	
	Start	End
Public Comment Period for Draft EIR	16/03/2021	18/04/2021
Submit Final EIR to DEFF for a decision	26/04/2021	
DEFF decision making period on Final EIR (107 days)	27/04/2021	13/08/2021

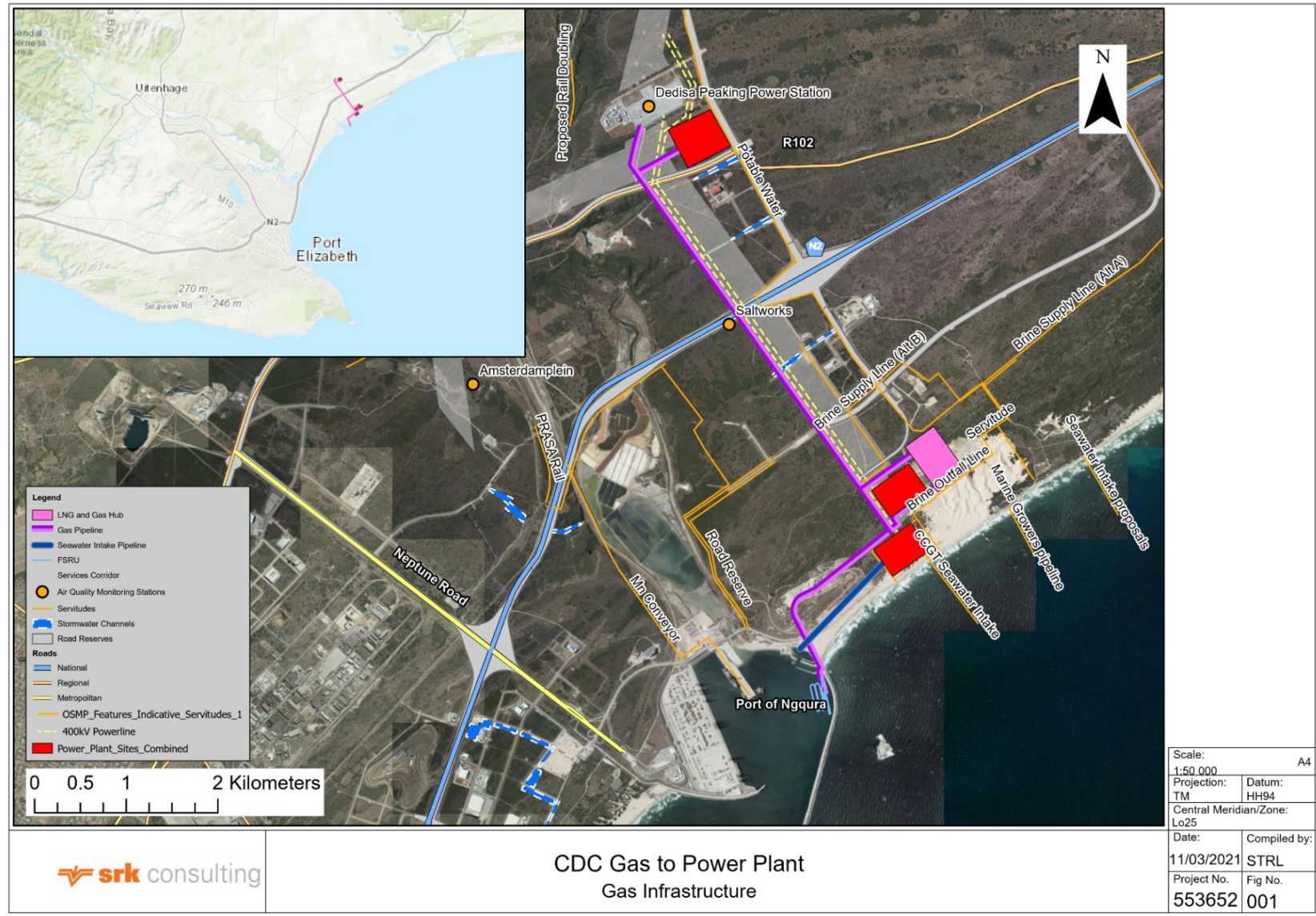


Figure 2: Site Locality Plan showing all components of the CDC gas to power project

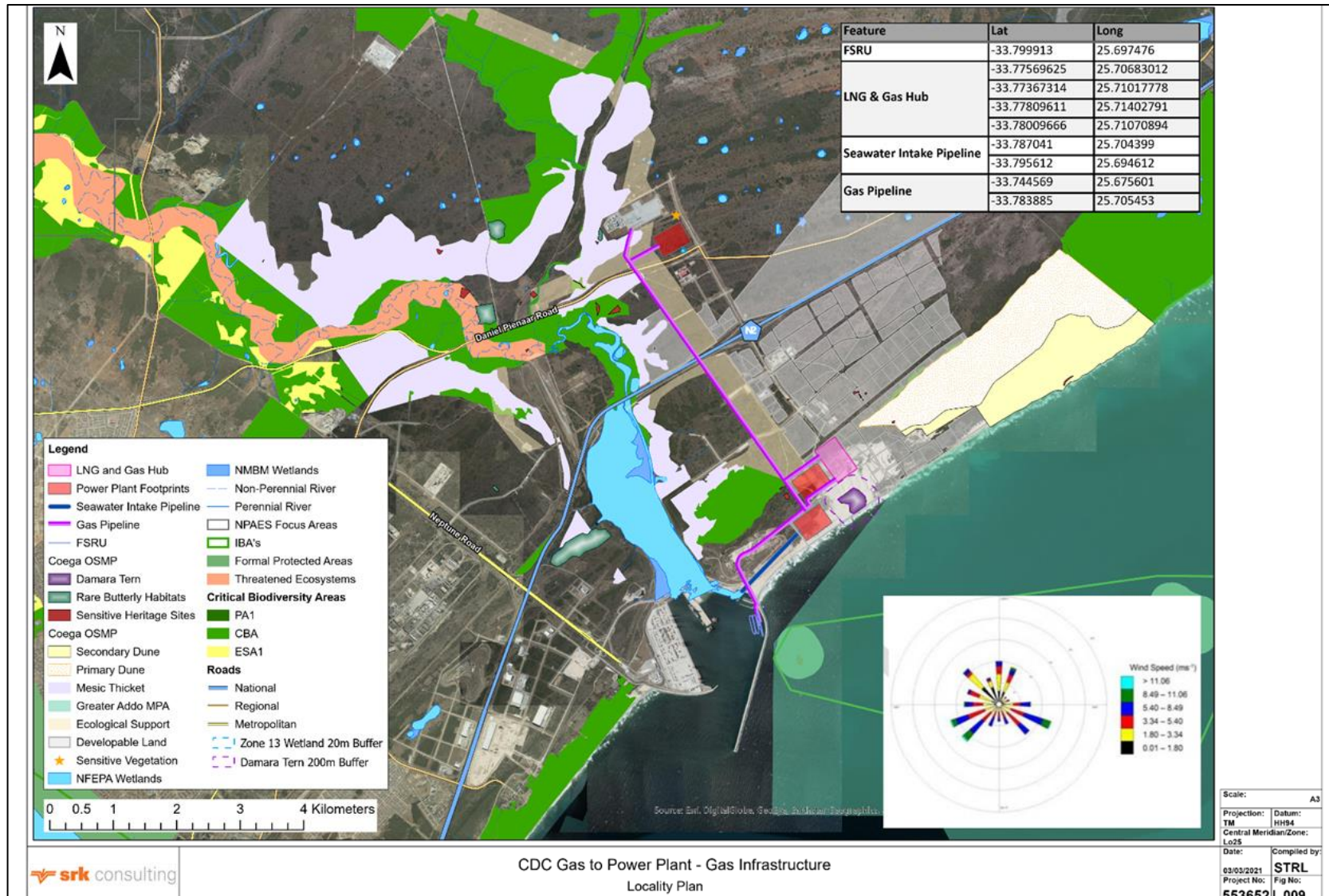


Figure 3: Terrestrial and marine environmental sensitivities in the area of the proposed Gas Infrastructure development footprint

Table 3: Summary of potential impacts and their significance

Impact group	Impact Description	During Construction		During Operation	
		without mitigation	with mitigation	without mitigation	with mitigation
Visual	V1: Change in visual character and sense of place	Very low	Insignificant	Low	Low
Waste Management	WM1: Poor Waste Management resulting in pollution of surroundings	Medium	Insignificant	Low	Very low
Soil, Stormwater & Erosion	WE1: Pollution of Soil and Stormwater, and increase in Erosion	Very low	Insignificant	Medium	Low
Terrestrial Ecology	TE1: Loss and disturbance of vegetation	Low	Very low	Medium	Low
Terrestrial Ecology	TE2: Impact on Damara Terns due to Disturbance	Medium	Medium	High	High
Heritage Resources	HR1: Damage or destruction of concentrations of Heritage Resources	Low	Very low	-	-
Traffic	TI1: Increased traffic volumes affecting traffic flow	Very low	Very low	Very low	Very low
Traffic	TI2: Additional axle loading resulting in deterioration of road condition	Very low	Very low	-	-
Traffic	TI3: Traffic safety impact due to additional / high-speed traffic	Very low	Very low	Very low	Very low
Dust	CA1: Dust impacts	Low	Very low	-	-
Infrastructure	CA2: Damage to other infrastructure	Insignificant	Insignificant	-	-
Fire	CA3: Veld fires and fire management	Very low	Insignificant	-	-
Climate Change	CC1: Impact on climate change by way of GHG emissions resulting from the project			Very high	Very high
Climate Change	CC2: Climate change risk and vulnerability of the project to climate change			Low	Very low
Noise	N1: Noise affecting nearby receptors	Very low	Insignificant	Very low	Very low
Socio-economic	SE1: Direct and Indirect employment opportunities	Low (positive)	Low (positive)	Medium (positive)	Medium (positive)
Socio-economic	SE2: Growth of the local, regional and provincial economies	Low (positive)	Low (positive)	Medium (positive)	Medium (positive)
Socio-economic	SE3: Contribution to increased energy security	-	-	High (positive)	-
Air Quality	AQ1: Impact on ambient SO ₂ , NO ₂ and PM ₁₀ concentrations	-	-	Insignificant	Insignificant
Air Quality	AQ2: Impact on CO	-	-	Insignificant	Insignificant
Safety Risks	QR1: Loss of containment of LNG (Phase 1)			Medium	Medium
Safety Risks	QR2: Loss of containment of LNG (Phase 2)			Medium	Low

Impact group	Impact Description	During Construction		During Operation	
		without mitigation	with mitigation	without mitigation	with mitigation
Marine Ecology	ME1: Benthic communities through disturbance and loss of substratum	Very low	Very low	-	-
Marine Ecology	ME2: Impact of increased suspended sediment concentrations or turbidity	Very low	Very low		
Marine Ecology	ME3: Toxic effects of remobilised contaminants and nutrients	Insignificant	Insignificant	-	-
Marine Ecology	ME4: Disturbance, behavioural changes and avoidance due to underwater noise generated by dredging and general construction	Very low	Very low		
Marine Ecology	ME5: Disturbance, behavioural changes and avoidance due to underwater noise generated by from the LNGCs and FSRU	-	-	Very low	Very low
Marine Ecology	ME6: Disturbance, behavioural changes and avoidance due to underwater noise due to pile driving, underwater drilling and hydraulic rock breaking	Medium	Very low	-	-
Marine Ecology	ME7: Creation of artificial hard strata	Very low (positive)	Very low (positive)	-	-
Marine Ecology	ME8: Intake of large volumes of seawater from the port	-	-	Medium	Low
Marine Ecology	ME9: Introduction and spread of alien invasive species	Medium	Low	-	-
Marine Ecology	ME10: Discharge of high volumes of water with depressed or elevated temperatures	-	-	Very low	Very low
Marine Ecology	ME11: Discharge of co-pollutants (biocide, metals, and salinity)	-	-	Very low	Very low
Marine Ecology	ME12: Increase in ambient lighting	-	-	Very low	Very low
Marine Ecology	ME13: Waste Discharges to Sea	-	-	Low	Low
Marine Ecology	ME14: Accidental Spills of LNG	-	-	Insignificant	Insignificant
Marine Ecology	ME15: Accidental Spills of Hypochlorite	-	-	Insignificant	Insignificant
Marine Ecology	ME16: Faunal strikes with LNGCs and Dredgers	-	-	Insignificant	Insignificant
Marine Ecology	ME17: Release of diesel to sea during bunkering or due to vessel accident	-	-	High	Insignificant

Colour Coding

Negative status of impact					Positive status of impact				
High	Medium	Low	Very Low	Insignificant	Insignificant	Very Low	Low	Medium	High