

FINAL SCOPING REPORT

Proposed Gas to Power Powership Project at the Port of Ngqura within the Coega SEZ, Nelson Mandela Bay Metropolitan Municipality, Eastern Cape

DEFF REF NO: 14/12/16/3/3/2/2005

A Project of Karpowership SA (PTY) Ltd



17 NOVEMBER 2020



DOCUMENT DESCRIPTION

Client / Applicant: Karpowership SA (Pty) Ltd

Report name: Final Scoping Report and Plan of Study for EIA for the Proposed Gas to Power Powership Project at the Port of Ngqura and Coega SEZ, Nelson Mandela Bay Metropolitan Municipality, Eastern Cape








Report type: Final Scoping Report and Plan of Study for EIA

Project name: Proposed Powership at Port of Ngqura within Coega SEZ at Nelson Mandela Bay Metropolitan Municipality, Eastern Cape, South Africa

Project number: E-BL01. 200444

Version: 1

Compiled and Authorised by:

| Compiled By: | Date | Signature |
|-----------------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------------------------------------------------|
| Naadira Nadasen (EAPASA) Sustainability Consultant | October- November 2020 / Ballito |  |
| Jyotika Daya (SACNASP) Sustainability Consultant | October- November 2020 / Ballito |  |
| Zayd Hoosen (EAPASA) Sustainability Consultant | October- November 2020 / Ballito |  |
| Reviewed By: | Date | Signature |
| Janice Tooley Environmental Legal Advisor | October- November 2020 / Ballito |  |
| Melissa Gopaul (nee Padayachee) (Pri.Sci.Nat EAPASA) Senior Sustainability Consultant | October- November 2020 / Ballito |  |
| Shanice Singh Sustainability Consultant | October- November 2020 / Ballito |  |
| Authorised By: | Date | Signature |
| Hantie Plomp (Pri.Sci.Nat EAPASA) Managing Director | October- November 2020 / Ballito |  |

COMPILED FOR:
Karpowership SA (Pty) Ltd

Compiled by:
Triplo 4 Sustainable Solutions (Pty) Ltd
Address: Suite 5, The Circle, Douglas Crowe Drive,
Ballito, 4420
Telephone: +27 (0)3 946 3213
Facsimile: +27 (0)32 946 0826
Email: hantie@triplo4.com
www.triplo4.com
© Copyright 2020 Triplo4 Sustainable Solutions

EXECUTIVE SUMMARY

The proposed **Gas to Power Powership Project at the Port of Ngqura** has been formulated in response to the *Request for Proposals (RFP) for New Generation Capacity under the Risk Mitigation IPP Procurement Programme* issued by the Department of Mineral Resources and Energy to alleviate the immediate and future capacity deficit as well as the limited, unreliable and poorly diversified provision of power generating technology with its adverse environmental and economic impacts. The “*Emergency/Risk Mitigation Power Purchase Procurement Programme (2000MW): National*” has also been designated the status of a Strategic Integrated Project (SIP) under the Infrastructure Development Act, 2014 by the Presidential Infrastructure Coordinating Commission. SIPs are considered to be projects of significant economic or social importance to South Africa as a whole or regionally that give effect to the national infrastructure plan and for this reason, can be expeditiously implemented through the provisions of the enabling Act.

The Project entails the generation of electricity from floating mobile Powerships moored in the Port of Ngqura. The Port falls under the jurisdiction of the TNPA and Coega SEZ under the Coega Development Corporation. The proposed combined design capacity for the Powerships is 540MW, comprising 27 gas engines and 3 steam turbines. A Floating Storage Regasification Unit (FSRU) will act as the storage and regasification facility. A Liquefied Natural Gas Carrier will supply the Liquefied Natural Gas (LNG) to the FSRU over a 1 to 2 day period approximately every 20 days. From the Powership, power will be evacuated via a 132kV transmission line over a distance of approximately 6.8 km to the Eskom Dedisa Substation which feeds into the national grid.

Alternatives being considered for this Project include two mooring siting positions, two alternative routes for the gas pipeline, two 132kV transmission line route options and two transmission line connection points to the Dedisa substation.

The Project triggers a number of activities listed under the National Environmental Management Act 107 of 1998 (NEMA) which require environmental authorisation prior to commencement. Because these listed activities include activities described in the EIA Regulations Listing Notice 2 of 2014, the process that is required to be applied to the application for environmental authorisation is Scoping and Environmental Impact Reporting (S&EIR). The procedural requirements for S&EIR are set out in the Environmental Impact Assessment Regulations, 2014 (as amended) (the EIA Regulations, 2014).

The objectives of Scoping, are through a consultative process with Interested and Affected Parties (I&APs), including relevant organs of state, to:

- identify the relevant policies and legislation relevant to the activity;
- motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- identify and confirm the preferred activity and technology alternative through an identification of impacts and risks and ranking process of such impacts and risks;
- identify and confirm the preferred site, through a detailed site selection process, which includes an identification of impacts and risks inclusive of identification of cumulative impacts and a ranking process of

all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;

- identify the key issues to be addressed in the assessment phase;
- agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
- identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

A draft Scoping Report, including a Plan of Study for EIA, was subjected to a public participation process from 6 October to 6 November 2020. The draft report has been revised taking into consideration I&APs' comments, resulting in this Final Scoping Report which will be submitted to the competent authority, the Department of Environment, Forestry & Fisheries (DEFF) for consideration.

The following issues and impacts have been identified during Scoping:

- Liquefied Natural Gas (LNG) Carrier, Powerships and FSRU
 - Disturbance to marine habitat;
 - Disturbance to the sediment from mooring infrastructure;
 - Reduction in ambient air quality from increased atmospheric emissions;
 - Safety risk from potential leakage of LNG;
 - Safety risk of storage of NG within the Port;
 - Increase in noise pollution;
 - Change in water temperature
 - Provision of additional electricity;
 - Contributions to climate change and Greenhouse Gases Emissions;
 - Marine traffic congestion and accidents
 - Visual Impact
- Gas Pipeline
 - Disturbance to marine habitat;
 - Potential leakage of LNG;
 - Increase in noise pollution;
 - Disturbance to coastal dunes.
- Transmission Lines and Lattice Towers/ Monopoles
 - Clearance of indigenous vegetation
 - Disturbance to the terrestrial ecosystem;
 - Loss of biodiversity;
 - Altered hydrology;
 - Increase in noise pollution;
 - Change in hydrogeological processes;
 - Destruction of wetlands, watercourses, estuarine areas;
 - Destruction of cultural heritage and palaeontological resources;

- Disturbance to properties and existing services;
- Provision of additional electricity.
- Visual impact

Initial mitigation measures for these impacts have been included in the Impacts Table in Section 8.2 but will be addressed further and in more detail by the relevant specialists in various reports to be submitted with the EIA Report (indicated in Section 9.2 of the Scoping Report).

Following receipt of this final Scoping Report, DEFF must within 43 days, either accept it, with or without conditions, and advise Karpowership to proceed or continue with the tasks contemplated in the plan of study for EIA or refuse environmental authorisation.

Should the DEFF accept the Scoping Report, the S&EIR process will proceed to the EIA phase. All registered I&APs will be notified of the opportunity to comment on the draft EIA Report in this next phase, inclusive of specialist reports and the Environmental Management Programme ("EMPR").

The same EIA process meets the requirements for an application for an atmospheric emission licence required for a Listed Activity under GN 893 of 22 November 2013 (as amended) in terms of Section 21 of the National Environmental Management: Air Quality Act 39 of 2004: Sub-category 1.5: Reciprocating Engines. The Powerships will have an approximate heat input of over 10MW each. The 3 steam turbines have a heat input of 15.45MW each.

TABLE OF CONTENTS

| | |
|---------------------------------------------------------------------------------------------------------------------------------|-----------|
| EXECUTIVE SUMMARY | I |
| TABLE OF CONTENTS | IV |
| THIS REPORT WAS COMPILED BY TRIPLO4 SUSTAINABLE SOLUTIONS (PTY) LTD IN TERMS OF APPENDIX 2 TO GNR 982 (AS AMENDED) | 1 |
| 1 INTRODUCTION | 1 |
| 1.1 PROJECT TITLE | 1 |
| 1.2 BACKGROUND | 1 |
| 1.3 INDEPENDENT ENVIRONMENTAL ASSESSMENT PRACTITIONER AND EIA TEAM | 2 |
| 1.4 PURPOSE OF THIS REPORT | 3 |
| 1.5 SCOPING REQUIREMENTS AS PER EIA REGULATIONS 2014 (AS AMENDED) | 4 |
| 1.6 REPORT STRUCTURE | 7 |
| 2 DESCRIPTION OF THE PROPOSED ACTIVITY | 8 |
| 2.1 DESCRIPTION OF THE ACTIVITIES TO BE UNDERTAKEN INCLUDING ASSOCIATED STRUCTURE AND INFRASTRUCTURE AS PER SECTION 2(d) | 8 |
| 2.1.1 POWERSHIPS | 9 |
| 2.1.2 BERTHING & MOORING OF THE POWERSHIPS AND FSRU | 10 |
| 2.1.3 GAS LINES | 11 |
| 2.1.4 TRANSMISSION LINES | 11 |
| 2.1.5 WATER REQUIREMENTS | 12 |
| 2.1.6 WATER TEMPERATURE | 12 |
| 2.1.7 STORAGE OF HAZARDOUS GOODS | 13 |
| 2.1.8 REFUELLING | 13 |
| 2.1.9 WASTE GENERATION AND MANAGEMENT | 13 |
| 2.1.10 RISKS AND POSSIBLE EXPLOSIONS | 13 |
| 2.1.11 LIGHTNING MITIGATION MEASURES | 13 |
| 2.1.12 SECURITY MEASURES | 14 |
| 2.2 LISTED AND SPECIFIED ACTIVITIES TRIGGERED | 14 |
| 2.2.1 NEMA: EIA REGULATIONS 2014 (AS AMENDED) | 14 |
| 2.2.2 NEM:AQA | 20 |
| 2.3 PROJECT LOCALITY | 21 |
| 2.3.1 LOCATION OF THE ACTIVITY | 21 |

| | | |
|------------|-----------------------------------------------------------------------------------|-----------|
| 2.3.2 | LOCALITY PLAN OF ACTIVITY | 22 |
| 2.3.3 | SITE ACCESS | 25 |
| 3 | ALTERNATIVES | 26 |
| 3.1 | DESCRIPTION OF FEASIBLE ALTERNATIVES | 26 |
| 3.1.1 | THE PROPERTY ON WHICH OR LOCATION WHERE IT IS PROPOSED TO UNDERTAKE THE ACTIVITY; | 26 |
| 3.1.2 | THE TYPE OF ACTIVITY TO BE UNDERTAKEN; | 27 |
| 3.1.3 | THE DESIGN OR LAYOUT OF THE ACTIVITY; | 28 |
| 3.1.4 | THE TECHNOLOGY TO BE USED IN THE ACTIVITY; | 36 |
| 3.1.5 | NO-GO ALTERNATIVE ACTIVITY. | 39 |
| 4 | SITE DESCRIPTION OF SURROUNDING LAND USE | 40 |
| 4.1 | TOPOGRAPHY AND BIOPHYSICAL ENVIRONMENT | 40 |
| 4.1.1 | ECO-REGION | 40 |
| 4.1.2 | GEOLOGY | 41 |
| 4.2 | STATUS OF SUB-QUATERNARY REACH | 41 |
| 4.2.1 | RAINFALL AND EVAPORATION | 42 |
| 4.2.2 | REGIONAL SETTING, TOPOGRAPHY AND SUB-CATCHMENT | 43 |
| 4.2.3 | CLIMATE | 43 |
| 4.2.4 | SOILS AND LAND MORPHOLOGY | 43 |
| 4.3 | GEOHYDROLOGY | 44 |
| 4.3.1 | AQUIFER CHARACTERISTICS, CLASSIFICATION AND GROUNDWATER RECHARGE | 44 |
| 4.3.2 | DEPTH TO GROUNDWATER | 44 |
| 4.4 | FAUNA AND FLORA | 44 |
| 4.4.1 | VEGETATION TYPES | 44 |
| 4.4.2 | CRITICAL BIODIVERSITY AREA (CBA) | 45 |
| 4.4.1 | EASTERN CAPE BIODIVERSITY CONSERVATION PLAN (ECBCP) | 46 |
| 4.4.2 | LOCAL – COEGA OPEN SPACE MANAGEMENT PLAN | 47 |
| 4.4.3 | SUBTROPICAL THICKET ECOSYSTEM PROGRAMME (STEP) | 47 |
| 4.5 | WATERCOURSES, INCLUDING WETLANDS | 47 |
| 4.5.1 | WATER MANAGEMENT AREAS | 47 |
| 4.5.2 | NATIONAL FRESHWATER ECOSYSTEM PRIORITY AREAS (NFPEA) | 48 |
| 4.5.3 | DELINEATED WATERCOURSES AND WATERCOURSE AT RISK | 48 |
| 4.6 | CONSERVATION AND PLANNING TOOLS | 48 |
| 4.6.1 | DEFF SCREENING TOOLS | 48 |
| 4.7 | SOCIAL AND ECONOMIC | 49 |
| 4.8 | AMBIENT AIR QUALITY | 51 |
| 4.8.1 | AIR EMISSIONS | 51 |
| 4.9 | MARINE & COASTAL ENVIRONMENT & CLIMATE CHANGE | 52 |
| 4.9.1 | COASTAL ENVIRONMENT & GEOMORPHOLOGY | 52 |
| 4.9.2 | MARINE ECOLOGY | 53 |

| | | |
|------------|---------------------------------------------------------------------------------------------------------------------------------|-----------|
| 4.9.3 | CLIMATE CHANGE ASPECTS | 54 |
| 4.11 | MARINE TRAFFIC ANALYSIS | 55 |
| 4.12 | NOISE | 56 |
| 5 | POLICY AND LEGISLATIVE FRAMEWORK | 57 |
| 5.1 | NATIONAL REGULATORY FRAMEWORK | 57 |
| 5.1.1 | NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NO 107 OF 1998 [AS AMENDED]) | 58 |
| 5.1.2 | NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT (NO 59 OF 2008) | 58 |
| 5.1.3 | NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT (NO 39 OF 2004) | 59 |
| 5.1.4 | MARINE LIVING RESOURCES ACT (ACT 18 OF 1998 AMENDED 2000) | 59 |
| 5.1.5 | NATIONAL ENVIRONMENTAL MANAGEMENT: INTEGRATED COASTAL MANAGEMENT ACT (24 OF 2008) | 59 |
| 5.1.6 | NATIONAL WATER ACT (NO 36 OF 1998) AND REGULATIONS | 60 |
| 5.1.7 | NATIONAL FOREST ACT (84 OF 1998) | 60 |
| 5.1.8 | NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT (NO 10 OF 2004) AND THE THREATENED OR PROTECTED SPECIES REGULATIONS (2007) | 61 |
| 5.1.9 | NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS ACT (31 OF 2004) | 61 |
| 5.1.10 | NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS ACT (31 OF 2004) - STRATEGY ON BUFFER ZONES FOR NATIONAL PARKS (106 OF 2012) | 61 |
| 5.1.11 | NATIONAL HERITAGE RESOURCES ACT (NO 25 OF 1999) AND REGULATIONS | 62 |
| 5.1.12 | CONSERVATION OF AGRICULTURAL RESOURCES ACT (ACT NO 43 OF 1983) | 63 |
| 5.1.13 | NATIONAL PORTS ACT (12 OF 2005) | 63 |
| 5.1.14 | OCCUPATIONAL HEALTH AND SAFETY ACT (NO 85 OF 1993) | 63 |
| 5.1.15 | INFRASTRUCTURE DEVELOPMENT ACT 23 OF 2014 | 63 |
| 5.1.16 | HAZARDOUS SUBSTANCES ACT (NO 15 OF 1973) AND REGULATIONS | 64 |
| 5.1.17 | SANS 10103 (NOISE STANDARD) | 64 |
| 5.1.18 | NATIONAL ROAD TRAFFIC ACT (NO 93 OF 1996) | 65 |
| 5.1.19 | GAS ACT 48 OF 2001 | 65 |
| 5.1.20 | NATIONAL ENERGY REGULATOR ACT 40 OF 2004 | 66 |
| 5.1.21 | ELECTRICITY REGULATION ACT 4 OF 2006 | 66 |
| 5.2 | INTERNATIONAL AGREEMENTS | 69 |
| 6 | MOTIVATION, NEED AND DESIRABILITY | 71 |
| 6.1 | MOTIVATION FOR THE NEED AND DESIRABILITY FOR THE PROPOSED DEVELOPMENT | 71 |
| 6.2 | MOTIVATION FOR THE NEED AND DESIRABILITY OF THE ACTIVITY IN THE CONTEXT OF THE PREFERRED LOCATION | 88 |
| 7 | PUBLIC PARTICIPATION PROCESS | 90 |
| 7.1 | NOTIFICATION OF INTERESTED AND AFFECTED PARTIES | 90 |
| 7.2 | PRE-APPLICATION MEETING WITH COMPETENT AND APPROVAL OF PUBLIC PARTICIPATION PLAN | 92 |
| 7.3 | REGISTER OF INTERESTED AND AFFECTED PARTIES | 93 |
| 7.4 | COMMENTS AND RESPONSES TRAIL REPORT | 93 |

| | | |
|------------|-------------------------------------------------------------------------------------------|------------|
| 8 | PRELIMINARY IMPACT ASSESSMENT | 95 |
| 8.1 | METHODOLOGY TO DETERMINE AND RANK NATURE, SIGNIFICANCE AND CONSEQUENCES OF IMPACTS | 95 |
| 8.2 | PRELIMINARY IMPACT ASSESSMENT | 96 |
| 8.2.1 | PRELIMINARY SPECIALIST FINDINGS | 96 |
| 8.2.2 | HYDROPEDOLOGY | 96 |
| 8.2.3 | AMBIENT AIR QUALITY | 96 |
| 8.2.4 | CLIMATE CHANGE | 98 |
| 8.2.5 | NOISE | 98 |
| 8.2.6 | CUMULATIVE IMPACTS | 98 |
| 8.2.7 | PRELIMINARY IMPACT ASSESSMENT | 99 |
| | THE FOLLOWING TABLE PRESENT THE SITE SPECIFIC IMPACTS WITH MITIGATION MEASURES. | 99 |
| 9 | PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASSESSMENT | 113 |
| 9.1 | ALTERNATIVES | 113 |
| 9.2 | ASPECTS TO BE ASSESSED AS PART OF THE EIA PROCESS | 114 |
| 9.3 | IMPACT ASSESSMENT METHODOLOGY | 115 |
| 9.3.1 | SPECIALIST STUDIES | 116 |
| 9.4 | STAGES AT WHICH THE COMPETENT AUTHORITY WILL BE CONSULTED | 127 |
| 9.5 | PUBLIC PARTICIPATION PROCESS TO BE CONDUCTED DURING THE EIA PROCESS | 127 |
| 9.5.1 | I&AP REVIEW OF THE DRAFT EIA REPORT, INCLUSIVE OF SPECIALIST REPORTS AND EMPR | 127 |
| 9.5.2 | I&AP ENGAGEMENT AND RECORDING OF COMMENTS | 128 |
| 9.6 | TASKS TO BE UNDERTAKEN AS PART OF THE EIA PROCESS | 128 |
| 9.7 | IMPACT MITIGATION AND ENVIRONMENTAL MANAGEMENT PROGRAMME | 128 |
| 10 | CONCLUDING STATEMENT | 129 |
| 11 | REFERENCES | 131 |

Table of Figures

| | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| FIGURE 2-1: LOCALITY MAP | 22 |
| FIGURE 2-2: SITE PLAN MAP | 23 |
| FIGURE 2-3: THE PREFERRED LOCATION AND GAS LINE ROUTE | 24 |
| FIGURE 2-4: PREFERRED POWER EVACUATION ROUTE | 24 |
| FIGURE 2-5: GOOGLE IMAGE SHOWING EXISTING ACCESS ROADS SYSTEM TO THE NGQURA PORT | 25 |
| FIGURE 3-1: COEGA SEZ ZONES | 26 |
| FIGURE 3-2: COEGA IDZ CLUSTER ZONES | 27 |
| FIGURE 3-3: POWERSHIP MOORING SYSTEM. | 28 |
| FIGURE 3-4: ALTERNATIVE 1: POSITION WITHIN THE PORT | 29 |
| FIGURE 3-5: ALTERNATIVE 2: POSITION WITHIN THE PORT | 30 |
| FIGURE 3-6: ALTERNATIVE 1: POWER EVACUATION ROUTE | 32 |
| FIGURE 3-7: ALTERNATIVE 2: POWER EVACUATION ROUTE | 33 |
| FIGURE 3-8: ALTERNATIVE 1 – GAS PIPELINE ROUTE (PINK LINE) | 35 |
| FIGURE 3-9: ALTERNATIVE 2 –GAS PIPELINE (PINK LINE) | 35 |
| FIGURE 3-10: A FLOW DIAGRAM FOR POWER GENERATION WITH ENGINES (LEFT), AND A BANK OF ENGINES CONNECTED IN SERIES | 36 |
| FIGURE 3-11: SCHEMATIC PRESENTATION OF A TYPICAL CCGT PROCESS | 37 |
| FIGURE 4-1: MONTHLY RAINFALL EVAPORATION DISTRIBUTION FOR THE M30B QUATERNARY CATCHMENT | 42 |
| FIGURE 4-2: AVERAGE TEMPERATURE AND RAINFALL | 43 |
| FIGURE 4-3: MAP OF THE WMA, SUB-WMA AND QUATERNARY CATCHMENT THAT FALL WITHIN THE PROPOSED DEVELOPMENT | 47 |
| FIGURE 4-4: GOOGLE SATELLITE MAP OF THE COEGA IDZ, AND THE APPROXIMATE SIZE OF THE DIFFERENT ZONES (BINNEMAN 2010) | 55 |
| FIGURE 6-1: UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS (SOURCE: UN GENERAL ASSEMBLY, 21 OCTOBER 2015) | 72 |
| FIGURE 6-2: EXTRACT FROM THE CSIR REPORT (SETTING UP FOR THE 2020s: ADDRESSING SOUTH AFRICA’S ELECTRICITY CRISIS AND GETTING READY FOR THE NEXT DECADE, 2020) | 74 |
| FIGURE 6-3: NGQURA GAZETTED PORT LIMITS (GOVERNMENT GAZETTE No. 32873 –JANUARY 2010) | 80 |
| FIGURE 6-4: PRECINCTS AND BERTH LAYOUT OF THE PORT OF NGQURA | 81 |
| FIGURE 6-5: PORT OF NGQURA SHORT-TERM LAYOUT | 82 |
| FIGURE 6-6: PORT OF NGQURA MEDIUM-TERM LAYOUT | 83 |
| FIGURE 6-7: PORT OF NGQURA LONG-TERM LAYOUT (EXCL. THE NEW SPM) | 84 |
| FIGURE 6-8: PORT OF NGQURA LONG-TERM LAYOUT (INCL. THE NEW SPM) | 85 |
| FIGURE 6-9: PORT OF NGQURA LONG-TERM LAYOUT (INCL. THE NEW SPM) | 86 |
| FIGURE 6-10: COEGA SEZ ZONES | 88 |
| FIGURE 6-11: COEGA IDZ CLUSTER ZONES | 89 |

List of Tables

| | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| TABLE 1-1: INDEPENDENT EAP DETAILS | 2 |
| TABLE 2-1: APPLICABLE LISTED ACTIVITIES | 14 |
| TABLE 2-2: DETAILS OF THE LISTED ACTIVITY FOR THE PROPOSED GAS TO POWER POWERSHIP PROJECT (GG No. 37054, GN 893 OF 22 NOVEMBER 2013, AS AMENDED) | 20 |
| TABLE 2-3: MINIMUM EMISSION STANDARDS IN MG/NM3 FOR SUBCATEGORY 1.5 | 21 |
| TABLE 2-4: LOCATION OF THE PROPOSED ACTIVITY | 21 |
| TABLE 2-5: PROPERTY DESCRIPTION & 21 DIGIT SG CODE-- THE PREFERRED POWER EVACUATION ROUTE: | 25 |
| TABLE 3-1: COORDINATES FOR THE POWERSHIPS AND FSRU | 30 |
| TABLE 3-2: COORDINATES FOR THE TRANSMISSION LINE, INCLUDING ALTERNATIVES | 34 |
| TABLE 3-3: COORDINATES FOR THE GAS PIPELINES' ALTERNATIVES: | 35 |
| TABLE 4-1: DETAILED CHARACTERISTICS OF THE SOUTH EASTERN COASTAL BELT (20) LEVEL 1 ECO-REGION | 40 |
| TABLE 4-2: PRESENT ECOLOGICAL STATUS FOR THE COEGA RIVER SQR M30A-08796 | 41 |
| TABLE 4-3: CBA DESCRIPTIONS (ECBCP: SANBI, 2007) | 46 |
| TABLE 4-4: POWERSHIPS & TRANSMISSION LINES- ENVIRONMENTAL SENSITIVITIES IDENTIFIED BY THE DEFF SCREENING REPORT & PROPOSED WAY FORWARD ASSOCIATED SPECIALIST REQUIREMENTS | 48 |
| TABLE 4-5: DEMOGRAPHIC OVERVIEW | 49 |
| TABLE 4-6: GVA PER SECTOR | 51 |
| TABLE 4-6: MAXIMUM PREDICTED AMBIENT ANNUAL SO₂, NO₂ AND PM₁₀ CONCENTRATIONS IN MG/M³ AND THE PREDICTED 99TH PERCENTILE CONCENTRATIONS FOR 24-HOUR AND 1-HOUR, WITH THE SOUTH AFRICAN NAAQS | 52 |
| TABLE 4-7: TYPICAL RATING LEVEL FOR NOISE IN VARIOUS DISTRICT TYPES. | 56 |
| TABLE 5-1: CATEGORIES OF ENVIRONMENTAL COMMUNITY / GROUP RESPONSE (SANS 10103:2008). | 65 |
| TABLE 5-2: APPLICABLE PROVINCIAL PLANS, STRATEGIES AND PROGRAMMES | 68 |
| TABLE 5-3: APPLICABLE-- REGIONAL AND LOCAL PLANNING FRAMEWORKS | 69 |
| TABLE 8-1: MAXIMUM PREDICTED AMBIENT ANNUAL SO₂, NO₂ AND PM₁₀ CONCENTRATIONS IN MG/M³ AND THE PREDICTED 99TH PERCENTILE CONCENTRATIONS FOR 24-HOUR AND 1-HOUR, WITH THE SOUTH AFRICAN NAAQS | 97 |
| TABLE 8-2: AIR QUALITY IMPACT SCORES | 97 |

Appendices

APPENDIX A: SITE PLAN (S)
APPENDIX B: FACILITY ILLUSTRATIONS (S)
APPENDIX C: IMPACT MATRIX
APPENDIX D: PUBLIC PARTICIPATION
APPENDIX D1: PPP SUMMARY
APPENDIX D2: APPROVED PP PLAN
APPENDIX D3: NOTIFICATION OF APPLICATION, SITE NOTICES AND FLYERS
APPENDIX D4: PROOF OF NOTIFICATION OF APPLICATION SITE NOTICES, FLYERS AND PUBLIC DOCUMENT
APPENDIX D5: ADVERTISEMENTS
APPENDIX D6: PROOF OF ADVERTISEMENT
APPENDIX D7: IAP DATABASE
APPENDIX D8: BID&COMMENT FORM
APPENDIX D9: COMMENTS AND RESPONSES TRAIL REPORT
APPENDIX D10: I&AP CORRESPONDENCE
APPENDIX D11: OTHER MEDIA SOURCES
APPENDIX D12: MINUTES, ATTENDEES LIST AND PRESENTATION FROM PUBLIC MEETING
APPENDIX E: DETAILS OF EAP AND EXPERTISE
APPENDIX F: DEFF CORRESPONDENCE
APPENDIX G: DEA SCREENING TOOL
APPENDIX G1: TRANSMISSION LINES
APPENDIX G2: POWERSHIP
APPENDIX H: ADDITIONAL INFORMATION
APPENDIX H1: PRE-APP MEETING MINUTES
APPENDIX H2: REGULATIONS
APPENDIX H3: LANDOWNERS CONSENT

THIS REPORT WAS COMPILED BY TRIPLO4 SUSTAINABLE SOLUTIONS (PTY) LTD IN TERMS OF APPENDIX 2 TO GNR 982 (AS AMENDED)

1 INTRODUCTION

1.1 Project Title

The Final Scoping Report and Plan of Study for EIA for the Proposed Gas to Power Powership Project at the Port of Ngqura and Coega SEZ, Nelson Mandela Bay Metropolitan Municipality, Eastern Cape.

1.2 Background

Triplo4 Sustainable Solutions (Pty) Ltd has been appointed by Karpowership SA (Pty) Ltd (Karpowership) to undertake the environmental impact assessment (EIA) and manage the application for Environmental Authorisation as well the Atmospheric Emission Licence for the proposed Gas to Power Powership Project at the Port of Ngqura and Coega Special Economic Zone (SEZ), located within ward 53 of the Nelson Mandela Bay Metropolitan Municipality, Eastern Cape. The Competent Authority responsible for evaluating and deciding on the application for environmental is the Department of Environment, Forestry & Fisheries (DEFF). The respective landowners of the Port and SEZ are Transnet National Ports Authority (TNPA) and Coega Development Corporation (CDC).

The applicant is Karpowership SA Pty Ltd, a South African company with 51% owned by Karpowership, a member of Karadeniz Energy Group, Istanbul, Turkey which owns, operates and builds Powerships (floating power plants). Since 2010, 25 Powerships have been completed with total installed capacity exceeding 4,100 MW globally with an additional 4,400 MW of Powerships either under construction or in the pipeline.

Karpowership proposes to locate Powerships in the Ngqura Port to generate electricity from natural gas which will be evacuated through a 132 kV transmission line to a substation, and then to the national grid. Three ships will be berthed at any one time - a Floating Storage Regasification Unit (FSRU) and two Powerships. A gas pipeline will be connected from the FSRU to the powerships. The two types that are likely to be used for the project are the Khan Class and Shark Class powerships.

The proposed technology for the production of electricity through natural gas-fired reciprocating engines and steam engines is designed to improve efficiency of energy generation. Construction is limited to transmission and gas supply lines as the ships are built internationally and arrive fully equipped in the port ready for operation.

The proposed Project has been formulated in response to the Request for Proposals (RFP) for New Generation Capacity under the Risk Mitigation IPP Procurement Programme issued by the Department of Mineral Resources and Energy to alleviate the immediate and future capacity deficit as well as the limited, unreliable and poorly diversified provision of power generating technology with its adverse environmental and economic impacts. The RFP stipulates stringent environmental, social and economic criteria, for example, the shift from coal and LPG to NG as a cleaner and more cost effective resource, BBBEE criteria and skills development. The "Emergency/Risk Mitigation Power Purchase Procurement Programme (2000MW): National" has also been designated the status of a Strategic Integrated Project (SIP) under the Infrastructure Development Act, 2014 by the Presidential Infrastructure Coordinating Commission. SIPs are considered to be projects of significant economic or social importance to South Africa as a whole or regionally that give effect to the national infrastructure plan and for this reason, can be expeditiously implemented through the provisions of the enabling Act.

1.3 Independent Environmental Assessment Practitioner and EIA Team

2014 NEMA EIA Regulations (as amended), Appendix 2. 2. (1) (a) A scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include— (a) details of—(i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;

Please see Appendix E for EAP Declaration and full Curriculum Vitae.

Table 1-1: Independent EAP Details

| EAP | Triplo4 Sustainable Solutions |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| EAP Team Leader | Hantie Plomp |
| Educational qualifications | Masters in Environmental Management |
| Professional Registrations | EAPASA; SACNASP; AP with GBCSA |
| Voluntary Memberships | IAIAsa; IWMSA; IODSA, WISA |
| Experience at environmental assessments (yrs.) | > 20 Years |
| Postal Address | P.O. Box 6595 Zimbali 4418 |
| Telephone Number | 032 946 3213 |
| Cell Number | 083 308 8003 |
| Fax Number | 032 946 0826 |
| Email Address | hantie@triplo4.com / pppcoega@triplo4.com |
| EAP Compiler and Reviewer | Ms. Melissa Gopaul |
| Educational qualifications | Honours in Environmental Management |
| Professional Registrations | SACNASP (Pri.Sci.Nat) EAPASA |
| Voluntary Memberships | IAIAsa; IWMSA; WISA |
| Experience at environmental assessments (yrs.) | >7 years |
| EAP Compiler | Mrs. Naadira Nadasen |
| Educational qualifications | Masters in Environmental Management |
| Professional Registrations | EAPASA; |
| Voluntary Memberships | IAIAsa; |
| Experience at environmental assessments (yrs.) | >7 years |
| EAP Reviewer | Ms Shanice Singh |
| Educational qualifications | Honours in Environmental Management |
| Professional Registrations | EAPASA |
| Voluntary Memberships | IAIAsa |
| Experience at environmental assessments (yrs.) | >5 years |

| EAP | Triplo4 Sustainable Solutions |
|-------------------------------------------------------|----------------------------------|
| Preliminary Impact Assessment | Mr Zayd Hoosen |
| Educational qualifications | Masters in Environmental Science |
| Professional Registrations | SACNASP; |
| Voluntary Memberships | IAIAAsa; |
| Experience at environmental assessments (yrs.) | >6 years |
| Transmission Aspects and Impacts | Mrs Jyotika Daya |
| Educational qualifications | Honours in Environmental Science |
| Professional Registrations | SACNASP; Candidate EAPASA |
| Voluntary Memberships | N/A |
| Experience at environmental assessments (yrs.) | >6 years |

1.4 Purpose of this Report

2014 NEMA EIA Regulations (as amended), Appendix 2. 1 the objective of the scoping process is to, "through a consultative process:

- a) identify the relevant policies and legislation relevant to the activity;
- b) motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- c) identify and confirm the preferred activity and technology alternative through an identification of impacts and risks and ranking process of such impacts and risks;
- d) identify and confirm the preferred site, through a detailed site selection process, which includes an identification of impacts and risks inclusive of identification of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
- e) identify the key issues to be addressed in the assessment phase;
- f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
- g) identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

The Scoping phase forms part of the Scoping and Environmental Impact Reporting (S&EIR) process required for the application for environmental authorisation for the proposed Project. The purpose of this Scoping Report is to provide the Competent Authority with an understanding of the Project at Port of Ngqura and Coega SEZ, characterise the environmental and social context and describe the associated environmental attributes, identify potential environmental, social and heritage aspects and impacts associated with the Project including the early input from potentially I&APs and stakeholders in terms of the identification of key issues and areas of concern. The aim was to fully scope the key issues and areas of concern and carry forward those that require more detailed investigation, assessment and mitigation in the next phase, the EIA process.

I&APs were provided a 30 day comment period to comment on the Draft Scoping Report before it was finalised and submitted to the Competent Authority, DEFF, for consideration. Comments were submitted to pppcoega.triplo4@gmail.com as requested.

1.5 Scoping Requirements as per EIA Regulations 2014 (as amended)

This Scoping Report is the first of two sets of reports that must be prepared during the EIA process. Table 1-3 outlines the requirements of the Scoping Report as per the NEMA EIA Regulations (2014 and subsequent 2017 and 2018 amendments). According to Appendix 2 (1) "A scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include..." the information outlined in Table 1-3 below. In addition, a Public Participation Process (PPP) will be undertaken in accordance with sections 39-44, which outline the requirements for a successful (compliant) PPP.

Table 1-3: Requirements for the Scoping Report and content (in accordance with Appendix 2 of the EIA Regulations).

| Relevant section in GNR. 982 | Requirement description | Relevant section in this report |
|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| (a) Details of- | (i) The EAP who prepared the report; and | Section 1.3 |
| | (ii) The expertise of the EAP, including a curriculum vitae; | |
| (b) The location of the activity, including- | (i) The 21 digit Surveyor General code of each cadastral land parcel; | Section 2.3 |
| | (ii) Where available, the physical address and farm name; | |
| | (iii) Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties; | |
| c) A plan which locates the proposed activity or activities applied for at an appropriate scale | (i) A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or | Appendix A and Section 2.3 |
| | (ii) On land where the property has not been defined, the coordinates within which the activity is to be undertaken; | |
| (d) A description of the scope of the proposed activity, including | (i) All listed and specified activities triggered; | Section 2.2 |
| | (ii) A description of the activities to be undertaken, including associated structures and infrastructure; | Section 2.1 |
| (e) | A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process | Section 5 |

| | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| (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 location | Section 6 |
| (g) A full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including - | (i) Details of all the alternatives considered; | Section 3 |
| | (ii) Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; | Section 7 and Appendix D |
| | (iii) A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; | Appendix D |
| | (iv) The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; | Section 4 |
| | (v) The impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts- (aa) Can be reversed; (bb) May cause irreplaceable loss of resources; and (cc) Can be avoided, managed or mitigated; | Section 8 |
| | (vi) The methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; | Section 8 and 9 |
| | (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; | Section 8 |
| | (viii) The possible mitigation measures that could be applied and level of residual risk; | |
| | (ix) The outcome of the site selection matrix; | |
| | (x) If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and | Section 3 |
| | (xi) A concluding statement indicating the preferred alternatives, including preferred location of the activity; | Section 3 |
| (h) A plan of study for undertaking the environmental impact assessment process to be | (i) A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity; | Section 9 |
| | (ii) A description of the aspects to be assessed as part of the environmental impact assessment process; | |
| | (iii) Aspects to be assessed by specialists; | |

| | | |
|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| undertaken including - | (iv) A description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists; | |
| | (v) A description of the proposed method of assessing duration and significance; | |
| | (vi) An indication of the stages at which the competent authority will be consulted; | |
| | (vii) Particulars of the public participation process that will be conducted during the environmental impact assessment process; and | |
| | (viii) A description of the tasks that will be undertaken as part of the environmental impact assessment process; | |
| | (ix) Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored. | |
| (i) An undertaking under oath or affirmation by the EAP in relation to - | (i) The correctness of the information provided in the report; | Section 10 and Appendix E |
| | (ii) The inclusion of comments and inputs from stakeholders and interested and affected parties; and | |
| | (iii) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties; | |
| (j) | An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment; | |
| (k) | Where applicable, any specific information required by the competent authority; and | As per guidance provided at pre-application meeting (see Appendix H1 for minutes) and correspondence form DEFF (see Appendix F) |
| (l) | Any other matter required in terms of section 24(4)(a) and (b) of the Act. | The requirements in terms of section 24(4)(a) and (b)- will be addressed in the EIA phase. |
| (2) | Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a Scoping Report, the requirements as indicated in such notice will apply. | NEMA (Act 107 of 1998), as amended "Procedures for the assessment and minimum criteria for |

| | | |
|--|--|----------------------------------------------------------------------------------------------------------------------------------------------------|
| | | reporting on identified environmental themes in term of sections 24 (5) (a) and (h) and 44 of NEMA when applying for Environmental Authorisation". |
|--|--|----------------------------------------------------------------------------------------------------------------------------------------------------|

1.6 Report Structure

The structure of the report is as follows –

- Chapter 1 – Introduction:
- Chapter 2 – Project Description: Provides a description of the proposed development, the properties on which the development is to be undertaken and the location of the development on the property. The technical details of the project are also provided in this Chapter.
- Chapter 3 – Legal and Policy Framework: Identifies all the legislation and guidelines that have been considered in the preparation of this Scoping Report.
- Chapter 4 – Environmental and Social Baseline: Provides a brief overview of the bio-physical and socio-economic characteristics of the site and its environs that may be affected by the proposed development, compiled largely from published information, but supplemented by information from a site visit.
- Chapter 5 – The EIA Process: Provides details of the process that will be followed when conducting the EIA as per Regulation 23, including the public participation process conducted in terms of Regulation 41. This chapter includes the objectives of the EIA process as outlined in Appendix 3 of the EIA Regulations.
- Chapter 6 – Impacts and Risks identified during Scoping: Provides a description of the key issues that have been identified by the project team and through discussions with I&APs in the Scoping Phase, and that will be assessed in the EIA phase.
- Chapter 7 - Plan of Study: Sets out the proposed approach to the environmental impact assessment including:
 - A description of the scope of work that will be undertaken as part of the EIA phase, including any specialist reports or specialised processes, and the manner in which the described scope of work will be undertaken;
 - An indication of the stages at which the competent authority will be consulted;
 - A description of the proposed methodology for assessing the environmental issues and alternatives, including the option of not proceeding with the proposed development;
 - Particulars of the public participation process that will be conducted during the Environmental Impact Assessment (EIA) phase, and;
 - Any specific information required by the authority.
- References: Cites any texts referred to during preparation of this report.
- Appendices: Containing all supporting information.

2 DESCRIPTION OF THE PROPOSED ACTIVITY

2014 EIA Regulations (as amended), Appendix 2 - (d) (ii) a description of the activities to be undertaken, including associated structures and infrastructure.

2.1 Description of the Activities to be Undertaken Including Associated Structure and Infrastructure as per Section 2(d)

Karpowership proposes the generation of electricity from a floating mobile Powerships moored in the Port of Ngqura. Three ships will be berthed at any one time, during the project's 20 years lifespan (as per terms stipulated in the RMIPPPP) - a Floating Storage Regasification Unit (FSRU) and two Powerships. A Liquefied Natural Gas Carrier will supply the Liquefied Natural Gas (LNG) to the FSRU over a 1 to 2 day period approximately every 20 days. The natural gas once degasified is pumped from the FSRU to the Powership via a gas pipeline. The proposed design capacity for the Powerships are 540MW, which comprises 27 gas engines having an approximate heat input of over 10MW each. The 3 steam turbines have a heat input of 15.45MW each. The power that is generated is then converted by the on-board High Voltage substation and the electricity evacuated via a 132kV transmission line over a distance of approximately 6.8 km to the Eskom Dedisa Substation which feeds into the national grid.

The two Powerships and FSRU will be moored within the Port of Ngqura, more specifically, the two Powerships at existing docking structures, which form part of the break-water^[1] and the FSRU, against the break-water^[2]. The key criteria for the mooring sites are sufficient space for turning the LNG carrier as well as the approach channel shared with the container terminal to allow the safe passing of other traffic including container vessels, cargo vessels and tugs, and maintain the safety exclusion zone required for the ship-to-ship transfer of the LNG to the FSRU.

The Ship to Ship transfer of LNG will be managed under an international accredited process via trained personnel to ensure compliance and within clear quality, health and safety regulations. The fuel lines between the FSRU and the Powership will be via double walled with annular space being inerted and continuously purged with Nitrogen "N2" gas. A gas detector in circuit will identify a leak, so that the fuel gas can be immediately isolated and shut off, the leak identified, and the necessary repairs or replacements made.

Two mooring configurations are being considered. The first option is to position the two Powerships adjacent to the administrative craft basin and the FSRU along the eastern breakwater. The second is to position the two Powerships closer to the liquid bulk terminal and the FSRU along the curved portion of the eastern breakwater. The depth of the water in which the ships will be positioned is approximately 14m. The fuel/gas pipeline that connects from the FSRU to the Powerships ships will be routed along the break water to the Powerships. From one of the Powerships, an electricity tower and lines will connect to the Dedisa sub-station operated by Eskom on land which will provide electricity.

^[1] Geographical co-ordinates: 33°47'52.80"S 25°41'40.63"E and 33°47'50.80"S 25°41'41.69"E.

^[2] Geographical co-ordinates: 33°48'0.36"S 25°41'51.69"E.

2.1.1 Powerships

The Powerships are assembled off-site and will be delivered fully equipped and functional to the Port of Ngqura. They are essentially ships which have been fitted with the necessary equipment, including reciprocating engines, steam turbines, and a high voltage substation to generate and transmit electricity using natural gas as a fuel.

The fuel is supplied by a separate vessel, a Floating Storage Regasification Unit (FSRU) which stores the liquefied natural gas (LNG) and converts it to a gaseous state for delivery to the Powerships through a gas pipeline. A LNG carrier shall periodically supply LNG to the FSRU and will temporarily stay in the Port while offloading the LNG cargo.

Because the Powerships are equipped with reciprocating engines for power generation, they allow for a reliable supply of electricity with minimal impacts from load profile and number of starts and stops. Powerships with their modular generation capability, allow for greater technical flexibility for load cycling and shedding. The FSRU will store the Liquefied Natural Gas (LNG) fuel and convert the liquefied natural gas to natural gas to be delivered to the Powerships as per planned gas pipeline. Refer to of the images below in Figure 2-1 of Powerships, FSRU and the Project concept.

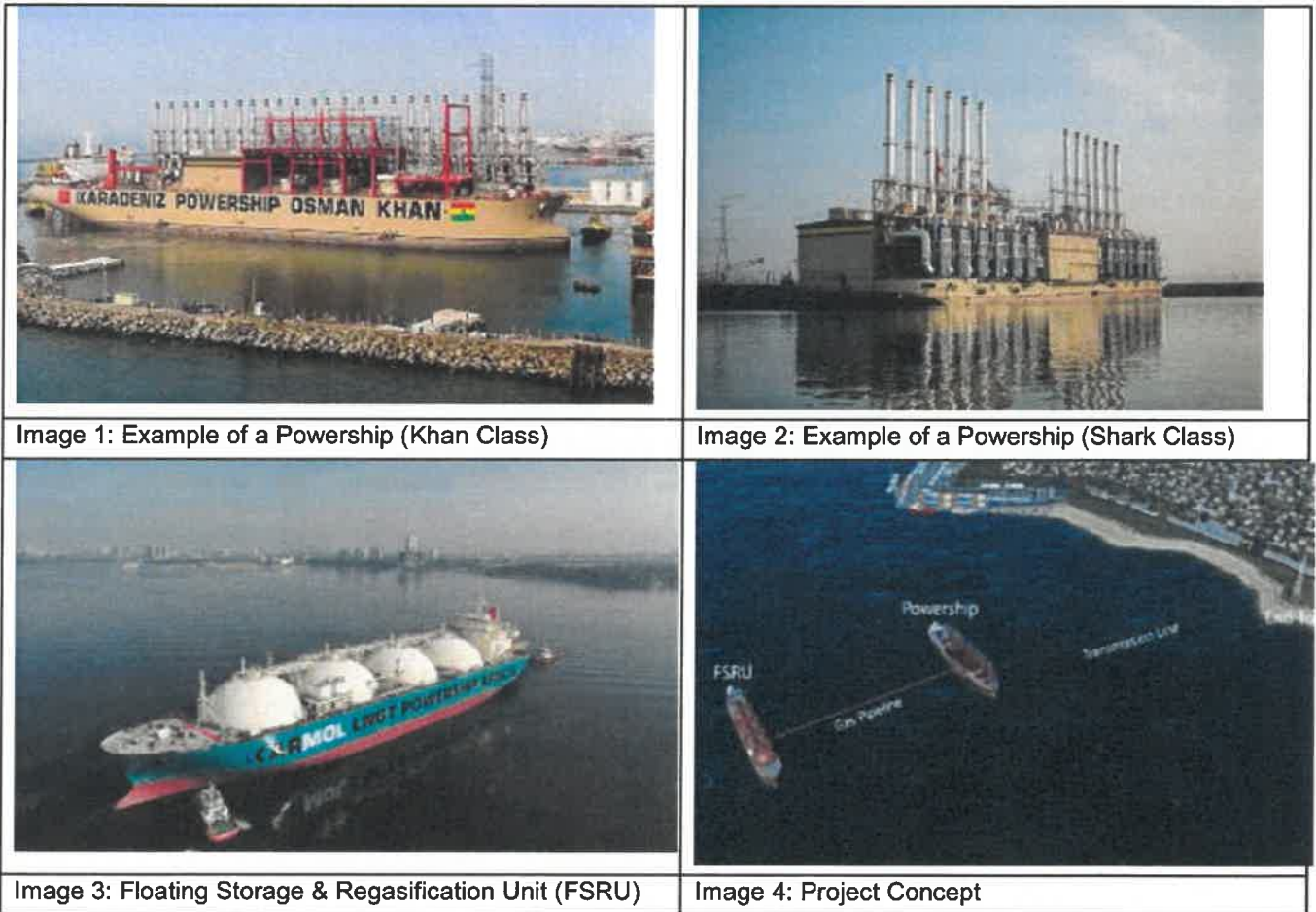


Figure 2-1: Images of Powerships

A LNG carrier shall supply LNG to the FSRU and will only stay 1-2 days to offload the LNG cargo. The LNG remains on the FSRU and is regasified to natural gas which is then pumped from the FSRU to the Powerships via gas pipeline.

The FSRU is specifically designed, constructed and equipped to supply the fuel gas required for the power generator engines installed on the Powerships.

The Powership's Charge Air Systems are designed and equipped with both wet and dry filtration systems, so that Powerships can continue to operate in extreme environments, including the locations where high levels of organic or inorganic dusts exist. Charge air filtering system day to day workmanship or its maintenance intervals may be affected by the pollutant intensity, but operations can continue. The Charge Air Filtering system has proved itself at other locations, for example at Guinea Conakry, where the Applicant is operating next to an iron ore exporting harbour.

FSRU regasifies the required amount of LNG and sends this to the Powerships in gaseous form (NG) continuously through a connecting pipeline. Natural gas boil off of LNG on board the FSRU is not flared or vented. The natural boil off is used as fuel for the operation of the FSRU and if in excess, is prioritised for export to the Powership for use in the generation of electrical power. In the event that boiled off gas (BOG) is in excess of the base load demand, then arrangements are provided on-board the FSRU for this excess BOG to be burnt in a specialised internal process. Under normal operations it is anticipated that the demand for gas will be significantly in excess of the natural boil off resulting in liquid LNG being re-gasified for export to the Powership. The NG is supplied to the engines. The engines in operation drive the generator shaft to generate electricity, and the heat generated by the engines may be captured and used by additional steam turbines for increased efficiency. The electricity generated is transmitted through the overhead transmission line to the substation to the national grid.

2.1.2 Berthing & Mooring of the Powerships and FSRU

The Powerships and FSRU are to be moored in the waters within the Port of Ngqura. The operational requirements at the Port cannot accommodate the use of existing berthing infrastructure, and therefore the vessels will be positioned in unused areas of the port and will utilise a mooring system comprising catenary mooring chains and anchors.

Berthing and mooring will be conducted by the Port Authority as per the Port's approved maintenance plans, procedures and requirements. Further, the ships will be located where adequate depths exist within the port.

No dredging will be required as the mooring locations are positioned in sufficient water depth to safely accommodate the moored vessels. In the process of identification of the potential sites, the existing cargo facilities and the Port's future short term developments have been avoided.

Key considerations for a suitable mooring position are the turning circle for the LNG carrier as well as that the approach channel to be shared with the container terminal, i.e. traffic in basin from container vessels, cargo vessels and tugs. Marine conditions derived for all design return periods include an allowance for potential climate change impacts (increases) on wind speeds, water levels and wave heights over the design life of the infrastructure.

2.1.3 Gas Lines

A gas line is required between the FSRU and Powerships to ensure gas supply for power generation.

There are two alternative routes for the gas pipeline. The first is routed along the edge of the existing eastern breakwater towards the craft basin connecting to the vessels via a flexible marine hose.

The second is along the edge of the existing eastern breakwater and existing roads and connecting to the vessels via a flexible marine hose. In addition, the onshore pipeline sections will be trenched in and the installation of the buried sections buried onshore sections will be rehabilitated to their original condition. The gas pipeline will likely need to be mounted on small footings requiring minor civil works to construct and install (approx. 1.4km in length for Alternative 1 and 0.7km in length for Alternative 2).

As reported by the applicant, leakages of gas from the FSRU, the LNG Carriers or the Powership are not anticipated, due to the design and procedures adopted by the applicant in managing the transportation, storage and regasification of LNG, undertaken with the primary purpose of 100% containment. Design features on-board the FSRU, Powership and incoming LNGC's to re-fuel the FSRU are appropriately sighted gas detection systems within annular spaces surrounding the containment for advance warning of any contained leakages, as well as in the open atmosphere, to detect and mitigate the remote chance of any leakages during the transfer stages.

The preferred route subsequent to the EIA process will also need to be approved by Transnet National Port Authority (TNPA). The Applicant is currently investigating the procurement of natural gas from global suppliers. As already mentioned, the gas will be shipped into the Port on a specialised carrier and offloaded to the FSRU.

2.1.4 Transmission Lines

The power generated on the ship will be converted by the on-board High Voltage substation and transmitted along 132kV twin conductor overhead transmission line. A transmission line (approximately 7 km) will be erected as part of the project from the Port through the Coega SEZ to the existing Dedisa Substation, which is also situated within the Coega SEZ). The proposed transmission line includes:

- Extension of the 132kV busbar at Dedisa substation.
- Establishing three 132kV feeder bays at Dedisa substation; and
- Construction of three 7.5km single circuit Twin Tern 132kV lines (350MVA each) from the Powership to the Dedisa substation.

There will be approximately 30 lattice towers/monopoles located along the transmission line. Each tower will cover a maximum footprint of 15m by 15m and the footprint of the monopole will be 0.6m x 0.6m to a maximum of 2.5m x 2.5m, both of which will necessitate the clearing of vegetation to allow for the steel lattice towers/monopole to be erected. The servitude, stretching the transmission line from the port to the substation, will have a width of 30m as per Eskom safety specifications.

The transmission lines potentially traverse watercourses or will fall within 32 metres of a watercourse. This may require the infilling or depositing or excavation, removal or moving of more than 10 cubic metres of material into, or from a watercourse and removal of more than 5 cubic metres of sand, within 100 metres inland of the high-water mark as well as removal of indigenous vegetation.

Access will be via the existing servitude, therefore no additional access roads will be required to be constructed. Regarding the lattice towers/monopoles visual impact, this will follow the existing service corridor that is already disturbed, where existing towers are already constructed. Monopoles are being considered as they are visually more appealing.

Routes options for the transmission lines are presented in the layout alternatives, Section 3.1 of this report.

2.1.5 Water requirements

The Powerships use seawater and potable water for cooling the reciprocating engines, condensers and other auxiliaries. The Powerships operate a once through cooling system, which abstracts seawater directly for cooling and then discharges it into the sea. The Powerships will have inlets and outlets to abstract and discharge seawater accordingly, and further details of this will be provided in the EIA Phase. Part of the cooling water is vaporized for steam generation (on board water treatment unit) and non-process water consumption. Seawater is primarily used for steam generation, make up water and for domestic use. Water supply for domestic use is produced using the onboard water treatment unit. Water supply for domestic use including potable water and technical water will be treated from the sea via fresh water generators and sea water reverse osmosis system. Water that is to be used for cleaning and bathing is produced using an onboard water treatment unit. Potable water will, where required be provided by local suppliers. The Powerships also has sewage treatment unit and oily bilge separator to be utilized while sailing.

The below presents a conceptual following volume of water required daily is anticipated:

- 400 litres of drinking water will be required for on-board utilisation;
- 1010 litres technical water for continuous Steam Turbine Generators (STG)operation; and
- 25-30 litres of water per engine is required and 200 litres for STG consumption.

No biocides or other additives are necessary to control bio-fouling in seawater pumping and temperature exchange systems. Part of the cooling seawater is processed into steam through an evaporation process for non-process water consumption. No discharge of brine is proposed.

2.1.6 Water Temperature

The Powerships will use seawater for cooling the generators and optionally the steam turbine generators and fresh water generators. The total intake/outlet flow rates range from 2.4 m³/s to 11.4 m³/s and the increase in temperature (ΔT) range from 4°C to 15°C. No chemicals such as chlorine or biocides are discharged with the cooling water. The dispersion of the resulting thermal plume depends on the flow rate, ΔT , discharge geometry, bathymetry, currents, winds and water column stratification. In confined water bodies with low water exchange there can be a build-up of temperature including recirculation from the intake to the outlet.

Typical ecological thresholds include $\Delta T = 3^{\circ}\text{C}$ at 100 m from the discharge point (World Bank), $\Delta T = 1^{\circ}\text{C}$ at sensitive receptors or the edge of the mixing zone, which for discharges beyond the surf-zone can be assumed as 300 m from the discharge point, according to the South African Marine Water Quality Guidelines (DWAf, 1995).

The results show that a smaller footprint of ΔT is achieved when discharging at a deeper depth below the water surface. Discharging at a deeper depth allows the thermal plume to entrain colder sub-surface ambient water as it rises to the surface, reducing the temperature of the plume. It can be concluded that the thermal plume meets the World Bank guideline and the generic South African Marine Water Quality Guideline when the cooling water is discharged 8 m below the water surface. [As confirmed by PRDW \(Consulting Port and Coastal Engineers\), the Thermal Plume will not move out of the port.](#)

2.1.7 Storage of Hazardous Goods

The liquefied natural gas stored on the FSRU at any given time will not exceed 175 000m³. The storage of NG on the Powerships is of small quantities and can be assumed as zero. The NG is stored in a series of pressurised containers on the FSRU.

2.1.8 Refuelling

The FSRU will be fuelling the Powerships. The LNG carrier will refuel the FSRU. Refuelling would be required approximately every 20 days, depending on the power generation capacity and output of the Powerships.

2.1.9 Waste generation and management

Due to daily operational activities and the regular repair and maintenance of the Powerships and FSRU, waste will be generated. There will be an approximate of 75m³ of sewage (black water) as well as grey water (washing and kitchen) generated and contained and thereafter disposed. All effluent and solid (general, and hazardous) waste will be removed by authorised service providers in terms of the legislation and TNPA and MARPOL requirements.

Sewage from on-board ablution facilities and bilge water will be produced in the Powerships. Pursuant to the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78 or "MARPOL Convention" in short) (Annexes I, II and IV), discharge of oil, noxious liquid substances, and sewage from vessels into marine environment is prohibited. All black and grey wastewater generated during operation of the Powerships' facilities will be removed by authorised service providers for appropriate off-site treatment and disposal.

2.1.10 Risks and Possible Explosions

[Safety performance is focused on risk and on the safe operation of the vessel as well as the containment of the LNG within the containment systems, including the pipeline. Should there be a minor leakage of LNG, it will disperse quickly and rise into the atmosphere very quickly.](#)

2.1.11 Lightning Mitigation Measures

[In the event of a lightning strike, the high conductivity of the large quantities of metal, with hundreds of square yards of hull in direct contact with the water, causes rapid dissipation of the electrical charge. The FSRU, Powerships and LNG carriers are designed to meet stringent lightning protection standards required by the Ship Classification Society. FSRU operations are safeguarded through 100% containment with no LNG interface with the atmosphere. Lightning strikes are easily dissipated by the steel structures without affecting the normal operational aspects of the FSRU, however, in such situations, it is normal practice to cease STS operations and make safe the transfer hoses through inerting and also maintaining the cargo containment.](#)

2.1.12 Security Measures

Powerships are equipped with advanced CCTV systems monitoring all areas, inside and out, in addition to surrounding fencing and razor wires to protect against unauthorized entry to the project site from land. Dedicated professional security team personnel are responsible for monitoring and constantly patrolling the vessels to prevent any un-authorized entry or attacks. In addition, prior to deployment of the Powership to her operating location, an independent security risk assessor visits the location, meets local authorities including port authorities and armed security forces, and provides detailed advice on any additional security measures that should be implemented before or during the operation over and above the proposed Security Plan specific to that project site.

The same independent security advisors visit the vessels shortly after their arrival, immediately after mooring arrangements are completed, to follow up and assess actual operation of the security systems and team. Regular follow up visits and assessments continue, and adaptation of systems and protocols would be made if the project site security risk status is deemed by them to have changed in the area over time.

In addition, a Floating Storage Vessel can be moved relatively quickly in the event that South Africa becomes exposed to terrorist activities. Access to these facilities are also more easily controlled than land based facilities.

2.2 Listed and Specified Activities Triggered

2014 EIA Regulations (as amended), Appendix 2 – 2(1)(d) (i) requires that a Scoping Report includes all listed and specified activities triggered

2.2.1 NEMA: EIA Regulations 2014 (as amended)

Table 2-1 below indicates the listed activities that are deemed applicable to the project at the port of Ngqura

Table 2-1: Applicable Listed Activities

| LISTED NOTICES | | |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LISTING NOTICE 1 | | |
| Activity No. | Activity Description | Applicability |
| Activity 11 | <i>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 (d) will be removed within 18 months of the commencement of development.</i> | The power generated on the ship will be converted by the on-board High Voltage substation (110kV-170kV) and transmitted inside an industrial complex along the 132kV twin conductor overhead transmission lines. |

| | | |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Activity 12</p> | <p><i>The development of—</i> <i>(ii) infrastructure or structures with a physical footprint of 100 square metres or more;</i> <i>where such development occurs—</i> <i>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse</i></p> | <p>Based on the path of the transmission line it is anticipated that development may take place within 32 metres of a watercourse.</p> |
| <p>Activity 19</p> | <p><i>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse.</i></p> | <p>Based on the path of the transmission line it is anticipated that development may take place within watercourses. This can only be confirmed with onsite verification.</p> |
| <p>Activity 19A</p> | <p><i>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from—</i> <i>(i) the seashore;</i> <i>(ii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater; or</i> <i>(iii) the sea.</i></p> | <p>The erection of the transmission lines may require the removal of more than 5 cubic metres of sand, within 100 metres inland of the high-water mark.</p> |
| <p>Activity 27</p> | <p><i>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> <i>the undertaking of a linear activity; or</i> <i>maintenance purposes undertaken in accordance with a maintenance management plan.</i></p> | <p>The transmission line and its servitude may require clearance of more than 1 hectares of indigenous vegetation</p> |
| <p>LISTING NOTICE 2</p> | | |
| <p>Activity 2</p> | <p><i>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.</i></p> | <p>The two Powerships and FSRU are assembled off-site and will be delivered fully equipped and ready to operate to the Port of Ngqura where they will be moored.</p> <p>The proposed design capacity for the two powerships is approximately 540MW, which comprises 27 gas engines having a heat input of over 10MW each. The 3 steam turbines have a heat input of 15.45MW each.</p> |

| | | |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | <p>The gas pipeline from the FSRU to the powerships and the transmission line from the powerships to the Substation trigger separately listed activities as does the need for an AEL which if issued, will regulate the atmospheric emissions during commissioning and operation of the project.</p> |
| Activity 4 | <p><i>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</i></p> | <p>Storage of LNG on the FSRU will exceed 500 cubic meters, anticipated to be maximum 175000 cubic meters at any given time.</p> |
| Activity 6 | <p><i>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></p> <p><i>(i) activities which are identified and included in Listing Notice 1 of 2014;</i></p> <p><i>(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 No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies</i></p> | <p>The engines used for electricity generation are a Listed Activity under GN 893 of 22 November 2013 (as amended) in terms of Section 21 of the NEM: AQA Sub-category 1.5: Reciprocating Engines. In the case of the proposed project, the Powerships will have a combined sum of 27 engines that all have a heat input capacity of more than 10 MW.</p> <p>The 3 steam turbines have a heat input capacity of less than 50 MW, but more than 10 MW. These units are therefore declared Controlled Emitters and it is expected that they will be regulated in terms of GN 831 of 1 November 2013 for Small Boilers.</p> |
| Activity 7 | <p>The development and related operation of facilities or infrastructure for the bulk transportation of dangerous goods—</p> <p>(i) in gas form, outside an industrial complex, using pipelines, exceeding 1 000 metres in length, with a throughput capacity of more than 700 tons per day;</p> <p>(ii) in liquid form, outside an industrial complex, using pipelines, exceeding 1 000 metres in length, with a</p> | <p>If the area is not considered industrial, there will be bulk transportation of dangerous goods in a gas form from outside an industrial complex using pipeline exceeding 1000metres in length with a throughput capacity of more than 700 tons per day.</p> |

| | throughput capacity of more than 50 cubic metres per day; or (iii) in solid form, outside an industrial complex, using funiculars or conveyors with a throughput capacity of more than 50 tons per day. | |
|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LISTING NOTICE 3 (The activity is situated within the SEZ within the urban area of the Nelson Mandela Metro) | | |
| Activity No. | Activity Description | Applicability |
| Activity 10 | <p><i>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.</i></p> <p>a. Eastern Cape</p> <p><i>i. Outside urban areas:</i></p> <p>(aa) <i>A protected area identified in terms of NEMPAA, excluding conservancies;</i></p> <p>(bb) <i>National Protected Area Expansion Strategy Focus areas;</i></p> <p>(cc) <i>Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</i></p> <p>(dd) <i>Sites or areas identified in terms of an international convention;</i></p> <p>(ee) <i>Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</i></p> <p>(ff) <i>Core areas in biosphere reserves;</i></p> <p>(gg) <i>Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve;</i></p> <p>(hh) <i>Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined;</i></p> | <p>The storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres. In addition, the proposed activity is borderline on the estuarine functional zone, but is it is within the sea, and littoral active zone. The proposed activity is approximately 5km away from the Addo Elephant National Park Marine Protected Area.</p> |

| | | |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <ul style="list-style-type: none"> (ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined; (jj) Within 500 metres of an estuarine functional zone, excluding areas falling behind the development setback line; (kk) In an estuarine functional zone, excluding areas falling behind the development setback line; or (ll) Within a watercourse; or <p>ii. Inside urban areas:</p> <ul style="list-style-type: none"> (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; or (cc) Within 500 metres of an estuarine functional zone, excluding areas falling behind the development setback line. | |
| <p>Activity 12</p> | <p><i>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.</i></p> <p><i>Eastern Cape</i></p> <ul style="list-style-type: none"> <i>i. 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;</i> <i>ii. Within critical biodiversity areas identified in bioregional plans;</i> <i>iii. Within the littoral active zone or 100 metres inland from the high water mark of the sea, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas;</i> <i>iv. Outside urban areas, within 100 metres inland from an estuarine functional zone; or</i> | <p>This activity may be triggered by the transmission lines as it is borderline on the estuarine functional zone, depending on the mapping resolution used, but is it within the littoral active zone and 100 metres inland from the high water mark of the sea. Furthermore the study area falls within CBAs.</p> |

| | | |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>v. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.</p> | |
| <p>Activity 14</p> | <p>The development of—</p> <p>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or</p> <p>(ii) infrastructure or structures with a physical footprint of 10 square metres or more;</p> <p>where such development occurs—</p> <p>(a) within a watercourse;</p> <p>(b) in front of a development setback; or</p> <p>(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;</p> <p>excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p> <p>i. Outside urban areas:</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(cc) World Heritage Sites;</p> <p>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(ee) Sites or areas identified in terms of an international convention;</p> <p>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(gg) Core areas in biosphere reserves;</p> <p>(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres</p> | <p>This activity may be applicable as the development of infrastructure or structures is not all located within the existing port or harbour.</p> <p>This activity is borderline on the estuarine functional zone, but is it is within the sea, and littoral active zone.</p> |

| | | |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| | <p><i>from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;</i></p> <p><i>(ii) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or</i></p> <p><i>(ij) In an estuarine functional zone, excluding areas falling behind the development setback line; or</i></p> <p><i>ii. Inside urban areas:</i></p> <p><i>(aa) Areas zoned for use as public open space;</i></p> <p><i>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose; or</i></p> <p><i>(cc) Areas seawards of the development setback line.</i></p> | |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

2.2.2 NEM:AQA

In terms of Section 21 of the Air Quality Act the Minister published a 'list of activities which result in atmospheric emissions and which the Minister or MEC reasonably believes have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage'. In terms of Section 21 of the Air Quality Act the consequences of listing an activity is that:

'No person may without a provisional atmospheric emission licence or an atmospheric emission licence conduct an activity—

- (a) listed on the national list anywhere in the Republic; or
- (b) listed on the list applicable in a province anywhere in that province.'

Table 2-2: Details of the Listed Activity for the proposed Gas to Power Powership Project (GG No. 37054, GN 893 of 22 November 2013, as amended)

| Category of Listed Activity | Sub-category of the Listed Activity | Application |
|--------------------------------------|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Category 1: Combustion Installations | Sub-category 1.5: Liquid and gas fuel stationary engines used for electricity generation | All installations with design capacity equal to or greater than 10 MW heat input per unit, based on the lower calorific value of the fuel use |

The applicability of this listed activity has been investigated by the EAP upon advice of the air quality specialist and will be confirmed in consultation with the licensing authority.

Table 2-3: Minimum Emission Standards in mg/Nm³ for Subcategory 1.5

| Substance or mixture of substances | | MES for sub-category 1.5 |
|-------------------------------------------------|-----------------|------------------------------------------------------------------------------|
| Common name | Chemical symbol | MES under normal conditions of 15% O ₂ , 273 Kelvin and 101.3 kPa |
| Particulate matter | N/A | 50 |
| Oxides of nitrogen (Expressed NO ₂) | NO _x | 400 |
| Sulphur dioxide | SO ₂ | N/A |

2.3 Project Locality

2014 EIA Regulations (as amended), Appendix 2 – 2(1) a scoping report must include (b) the location of the activity, including— (i) the 21 digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties; and (c) a plan which locates the proposed activity or activities applied for at an appropriate scale

2.3.1 Location of the activity

Table 2-4: Location of the proposed activity

| Description | Location of the Activity |
|----------------------------------------------------|------------------------------------------------------------------------------|
| Metropolitan Municipality | Nelson Mandela Bay Municipality (NMBM) |
| Municipal Ward | Ward 53 (borders Ward 60) |
| Area / Town / Village | Port of Ngqura and Coega Special Economic Zone, situated near Port Elizabeth |
| Property Description & 21 Digit SG Code | See Table 2-5 below |

Figures 2-1- 2-6 below present the, locality map and the location of the proposed Powerships within the port, as well as the preferred route for the transmission line – from the Port to the Dedisa Substation.

2.3.2 Locality Plan of Activity

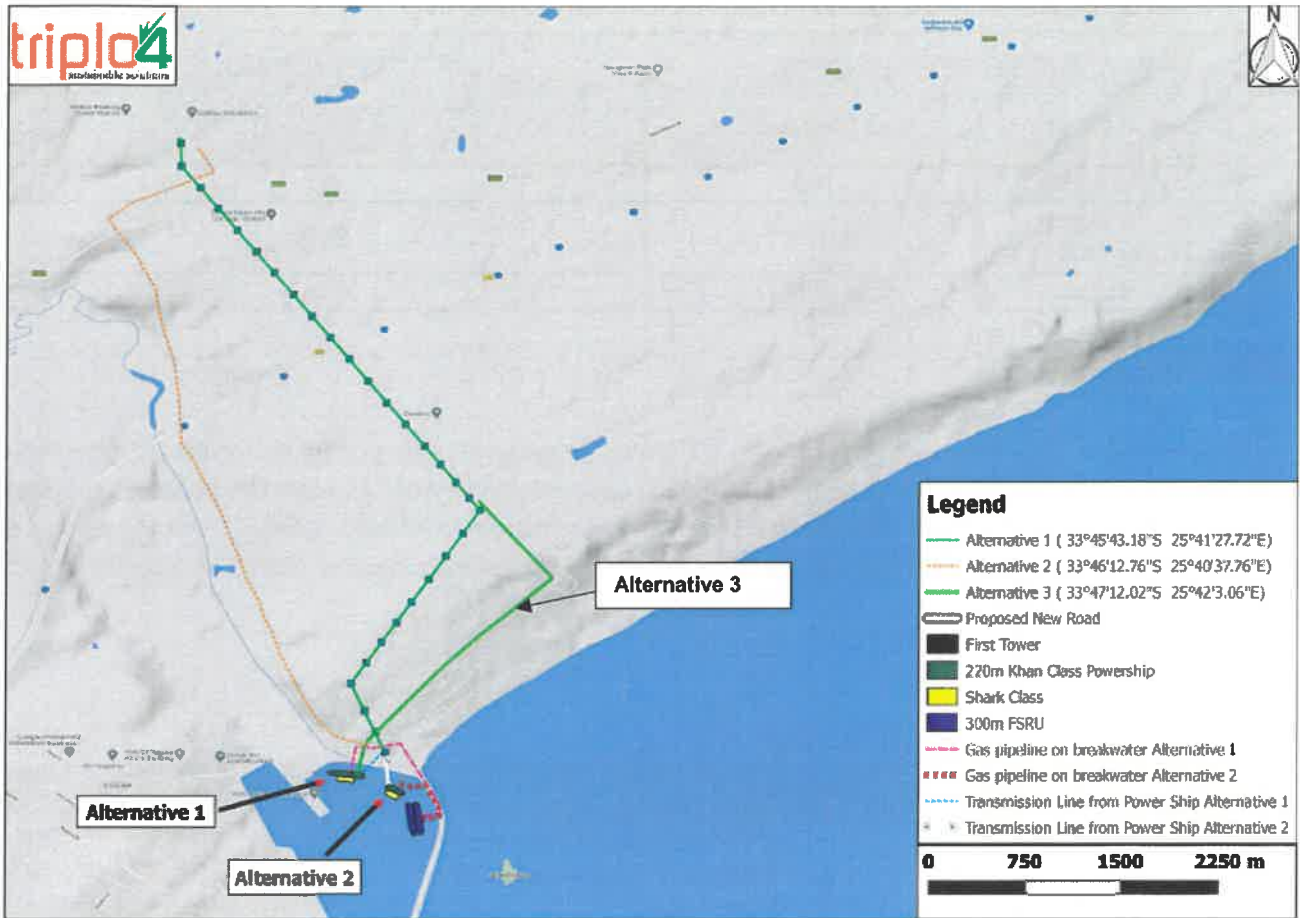


Figure 2-1: Locality Map

The Site Plan below provides further additional information regarding the location of the ships, gas pipeline and the transmission line. The site plan can also be located in Appendix A1.

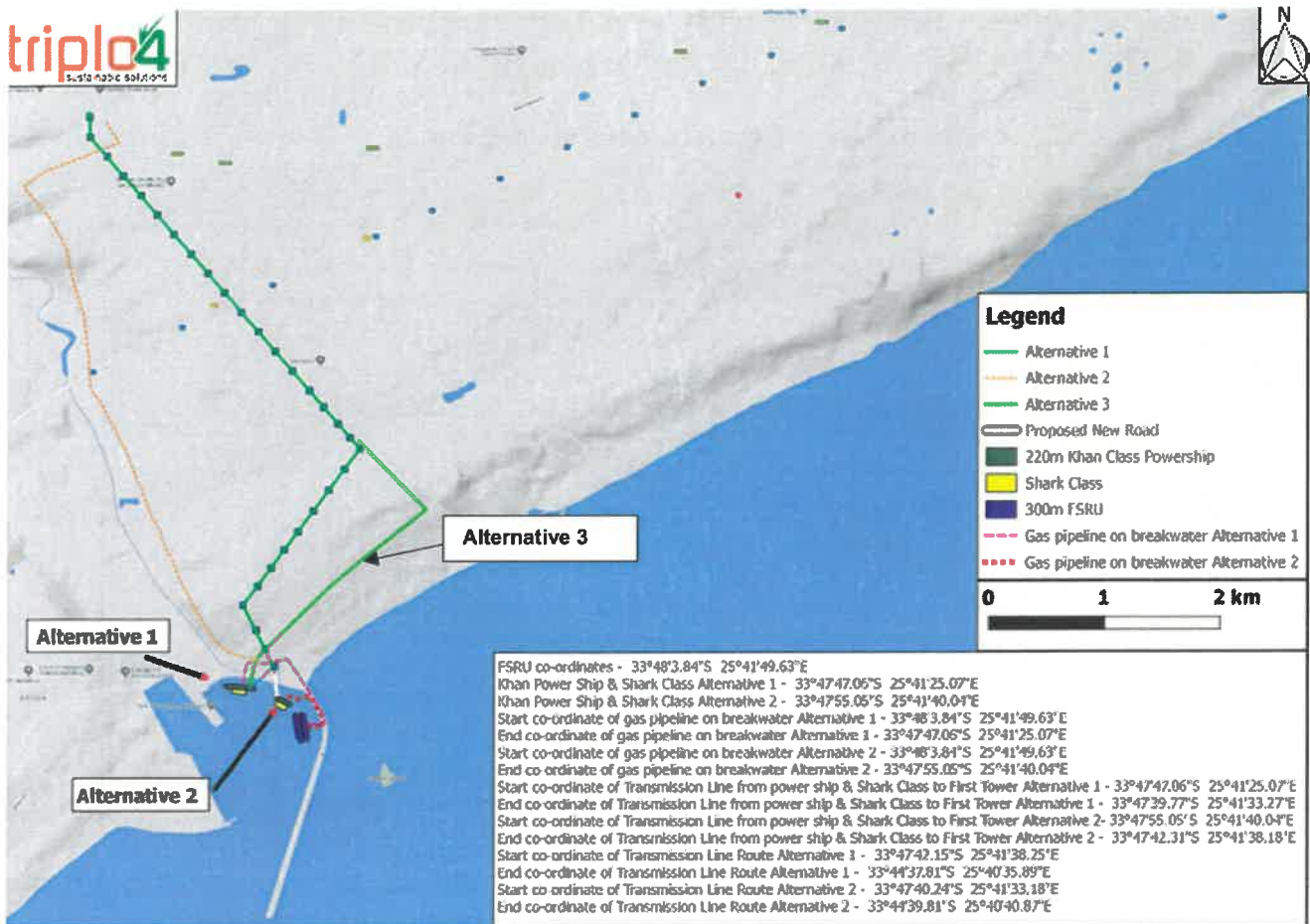


Figure 2-2: Site Plan Map

The FSRU will be mooring against the break-water at geographical co-ordinates 33°48'3.84"S; 25°41'49.63"E. The Powerships will be mooring at existing docking structures, which forms part of a minor extension of the break-water at geographical co-ordinates 33°47'47.06"S; 25°41'25.07"E (Alternative 1) and 33°47'55.05"S; 25°41'40.04"E (Alternative 2) for the Powerships, respectively. Alternative 3 is still being assessed.

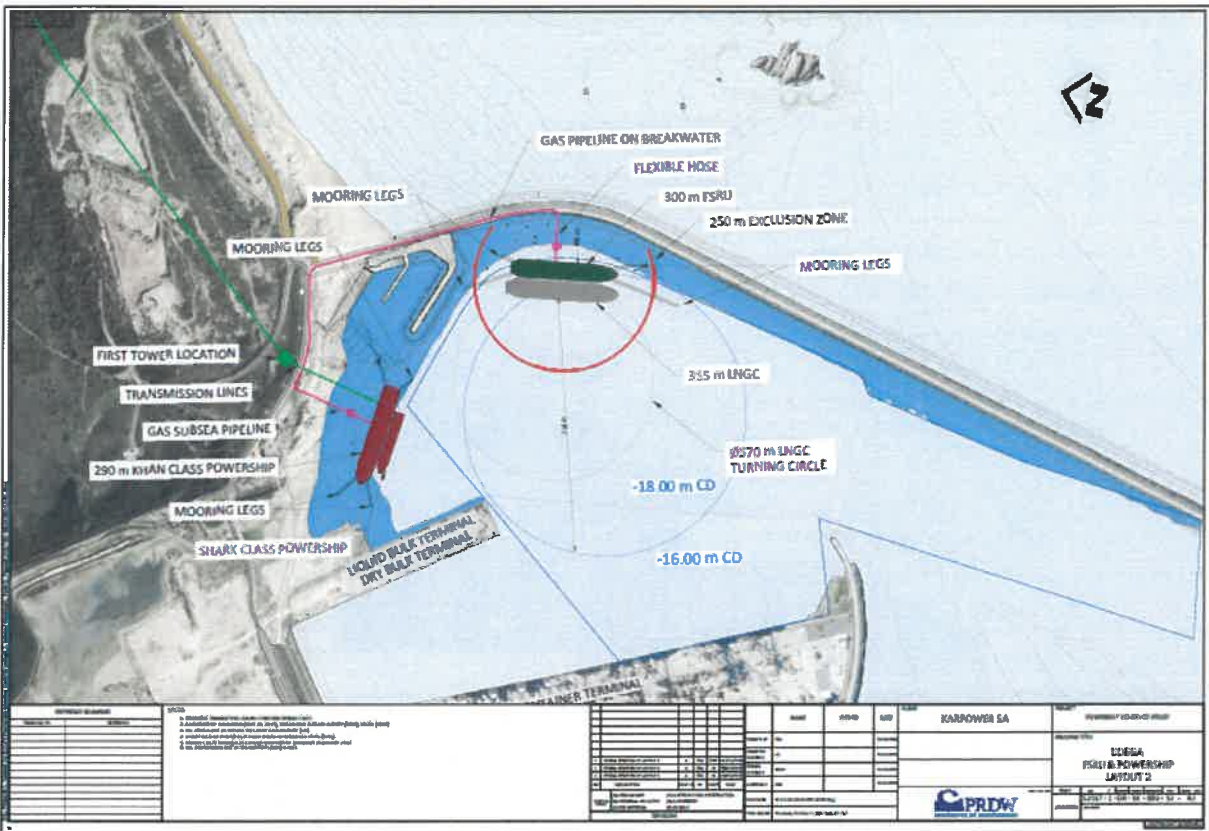


Figure 2-3: The Preferred Location and gas line route

The preferred location is situated in excess of 1km from Jahleel Island.



Figure 2-4: Preferred Power Evacuation Route

Table 2-5: Property Description & 21 Digit SG Code– The preferred power evacuation route:

| Properties | 21 SG CODES | CENTRAL GPS-COORDINATE | |
|------------|-----------------------|------------------------|------------|
| | | Longitude | Latitude |
| RE/255 | C07600230000025500000 | 25.699503 | -33.791463 |
| 312 | C07600230000031200000 | 25.689283 | -33.778180 |
| 329 | C07600230000032900000 | 25.693462 | -33.731429 |
| RE/342 | C07600230000034200000 | 25.673136 | -33.758690 |
| 344 | C07600230000034400000 | 25.676882 | -33.767851 |
| 351 | C07600230000035100000 | 25.713104 | -33.759756 |

2.3.3 Site Access

The proposed location of the Project is situated within the existing and operational Port of Ngqura and Coega IDZ, and therefore the existing access roads network from the N2 will be used to access the Powerships site. The position of the access road is indicated in Figure 2-5 below.



Figure 2-5: Google Image showing existing access roads system to the Ngqura Port

3 ALTERNATIVES

3.1 Description of Feasible Alternatives

2014 EIA Regulations (as amended), Appendix 2 – 2(1) a scoping report must include (g) (i) a full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including—(i) details of all the alternatives considered;

Regulation 1 of the EIA Regulations, 2014: “alternatives”, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

3.1.1 The property on which or location where it is proposed to undertake the activity;

3.1.1.1 Preferred Location: Port of Ngqura

Being a ship-based power generating operation (as opposed to land-based) with transmission of energy to land-based transmission connection points, locations that provide infrastructure suitable for the proposed technology were identified, which are essentially deep water ports. In addition to the Port of Ngqura, there are two other projects of a similar nature being proposed by Karpowership in Richards Bay and Saldanha for which separate applications for environmental authorisation are being submitted.

The bulk of the Project is to be located in the Port of Ngqura which is adjacent to the Coega Special Economic Zone, originally established as an Industrial Development Zone in 1999. It falls within the Nelson Mandela Bay Metropolitan Municipality (NMBM) in the Eastern Cape Province. The Coega SEZ, is managed by the Coega Development Corporation (CDC) and the Port of Ngqura, falls under the jurisdiction of by the Transnet National Ports Authority (TNPA).

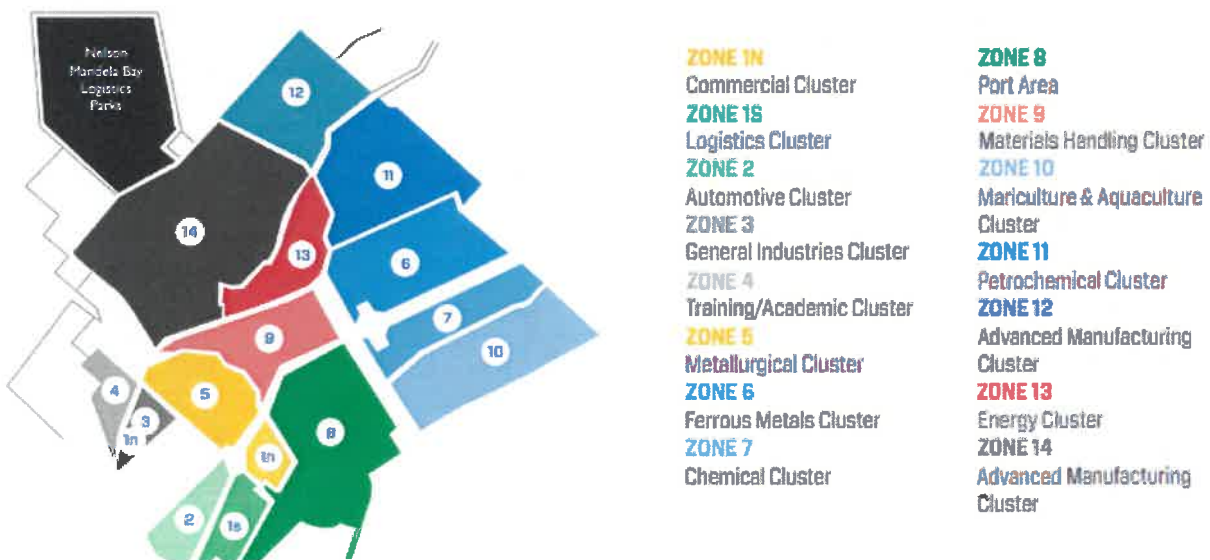


Figure 3-1: Coega SEZ Zones

The Port and Coega SEZ create opportunities through clusters that facilitate synergy and supply chain integration. Zone 8 Port Area and Zone 13 – Energy Cluster enable the location of the proposed project as per the lay-out and provisions of the Energy Cluster.

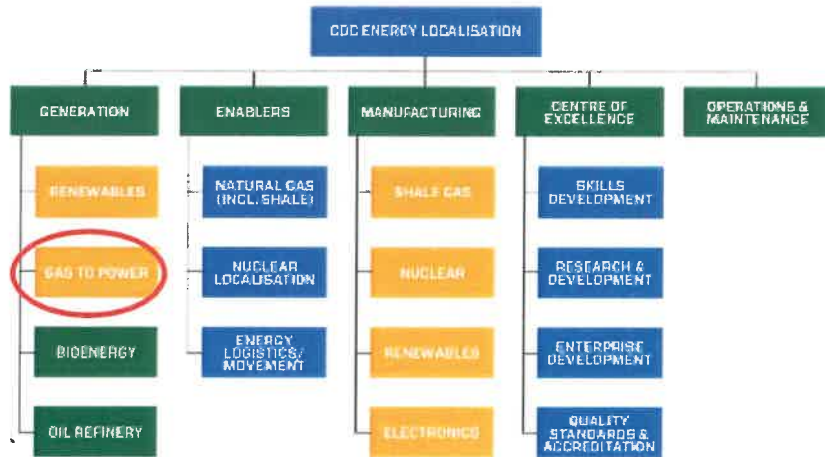


Figure 3-2: Coega IDZ Cluster Zones

As the Coega SEZ and Ngqura Port meet the requirements for the proposed Powership Project, this is the preferred location, and no other sites within this region are proposed for this project. Other ports such as Port Elizabeth were considered and evaluated as a potential site, however it was not selected as there were navigational issues associated and for this reason the Port of Ngqura was considered.

3.1.2 The type of activity to be undertaken;

The proposed activity is the generation of electricity by a Powership. Karpowerships business model provides for the generation of power using HFOs or natural gas as the power generation units can operate on both HFO and gas as per their design. Thus in terms of the definition of alternatives, "different means of meeting the general purpose and requirements of the activity", HFO as an alternative fuel to generate power from the Powership was further addressed as a technological alternative. The use of natural gas as a cleaner technology is thus proposed as the most feasible activity and BPEO alternative within Karpowership's energy generation activity.

3.1.3 The design or layout of the activity;

3.1.3.1 Layout Alternatives for the Development

Powership position alternatives within the port



Figure 3-3: Powership mooring system.

Feasible locations for the mooring of the Powerships and the FSRU were identified and assessed. The Powerships and FSRU are to be moored in the waters within the Port of Ngqura. The operational requirements at the Port cannot accommodate the use of existing berthing infrastructure and therefore the vessels will be positioned in unused areas of the port and will utilise their own mooring system comprising catenary mooring chains and anchors. The key criteria for the mooring site are sufficient space for turning the LNG carrier as well as the approach channel shared with the container terminal to allow the safe passing of other traffic including container vessels, cargo vessels and tugs, and maintain the safety exclusion zone required for the ship-to-ship transfer of the LNG to the FSRU.

No dredging is required as the mooring locations are positioned in sufficient water depth to safely accommodate the moored vessels. In the process of identifying feasible sites, the existing cargo facilities and the Port's future short term developments were avoided.

Key factors also requiring consideration are the size of the turning circle for the LNG carrier as well as the approach channel being shared with the container terminal, i.e. traffic in basin from container vessels, cargo vessels and tugs. The Powerships need to be located aft of the approach channel entrance and outside the turning circle so as to not to impede vessel traffic movement in the port. This will keep the safety exclusion zones required for the ship-to-ship transfer from the LNG to the FSRU.

Two mooring sites meeting these criteria have been identified and are being considered. The first option, Alternative 1, is to position the two Powerships adjacent to the administrative craft basin and the FSRU along the eastern breakwater. Alternative 1 is deemed the preferred position from an engineering design perspective, as the Powerships and FSRU are not located close to each other and are positioned adjacent to the break bulk quay /multi-purpose terminal. The second option, Alternative 2, is to position the two Powerships closer to the liquid bulk terminal and the FSRU along the curved portion of the eastern breakwater. Alternative 2 is considered less suitable from an engineering perspective, as the Powerships and the FSRU are located too close together and would be an issue in terms of navigational aspects. Alternative 1- is the preferred as it is in line with the FSRU in the port's long term FSRU berth position plans. Figures 3-4 and 3-5 below show the alternatives for the positioning of the Powerships.

The two alternatives, with the preferred position to be agreed with the Port and CDC, are illustrated in the two figures below:

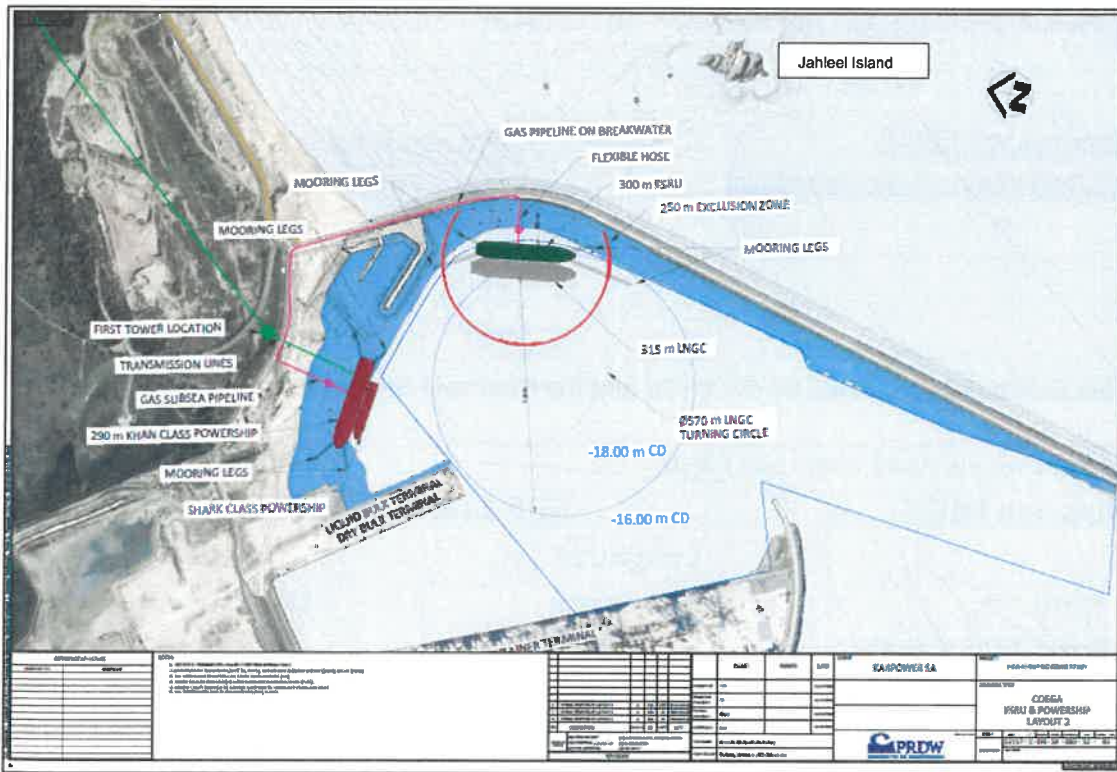


Figure 3-4: Alternative 1: position within the port

The preferred option above is situated in excess of 1km from Jahleel Island.

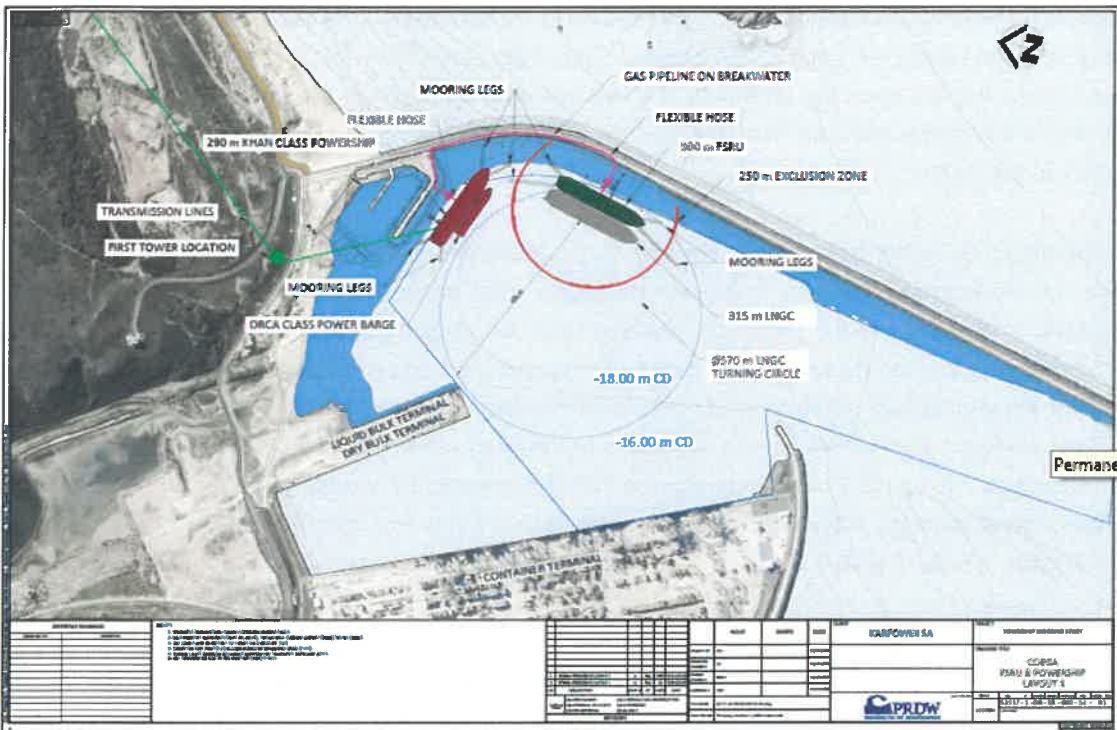


Figure 3-5: Alternative 2: position within the Port

Size of the Powerships and FSRU:

Alternative A1⁽¹⁾ (preferred activity alternative)

Size of the activity:

Power generation (moored at port within seawater):
 Powerships: 19 000m² each
 FSRU: 29 300m²

The following table provides coordinates for the FSRU and the Khan and Shark Classes

Table 3-1: Coordinates for the Powerships and FSRU

| Powerships and FSRU | GPS-COORDINATE | |
|---------------------------------------------------|----------------|----------------|
| | Longitude | Latitude |
| FSRU | 33°48'3.84"S | 25° 41'49.63"E |
| Powership Khan and Shark Classes Alternative 1 | 33°47'47.06"S | 25° 41'25.07"E |
| Powership Khan and Shark Classes Alternative 2 | 33°47'55.05"S | 25° 41'40.04"E |

Alternative 3 - a third layout alternative might be identified to accommodate minor changes, based on specialists' final input, and will be addressed in the EIA phase.

Transmission Lines Alternatives

The power generated is converted by a high voltage substation on board the Powerships and transmitted along a 132kV transmission line, approximately 7 km in length from Port to the Dedisa Substation, situated within the Coega SEZ. Three options are being investigated for the route namely:

1. Overhead lines along the services servitude;
2. Overhead lines adjacent to the transformed Coega Estuary;
3. A short overhead line to the shore and thereafter an underground line adjacent to the transformed Coega Estuary.

Two 132kV connection options to the Dedisa substation have been considered in detail in the technical assessment undertaken by Siris Engineering (Pty) Ltd (June 2020):

Alternative 1: 132 kV overhead line

This option utilises overhead lines to connect the Powerships' plant to Dedisa substation at 132 kV voltage level. Twin Tern conductors at higher templating temperature (rated @ 350 MVA each) are proposed to evacuate the power from the Powerships' plant to Dedisa substation.

This alternative comprises:

- Extension of the 132 kV busbar (metal bar to allow the powerships' transmission line to feed into the substation and into the grid) at Dedisa substation.
- Establishing 2 x 132 kV feeder bays at Dedisa; and
- Constructing 2 x 7.5 km (15 km) of single circuit Twin Tern 132 kV lines from the Powerships' plant to Dedisa substation on land operated by Eskom.

Alternative 2: 132 kV underground copper cable

This option utilises underground copper cables to connect the Powerships' plant to Dedisa substation at 132 kV voltage level. A single core 1000 mm² 132 kV copper XLPE cable with a rating of about 230 MVA is proposed, meaning that to evacuate 600 MW, a minimum of three (3) cables would be required.

The scope of work for the 132 kV cable connection solution comprises:

- Extension of the 132 kV busbar at Dedisa substation.
- Establishing 3 x 132 kV feeder bays at Dedisa; and
- Constructing 3 x 7.5 km (22.5 km) of 3 x single core 1000sq mm 132 kV underground copper cables from the Powerships' plant to Dedisa substation on land operated by Eskom.

The Powerships' capacity that can be connected is however limited by its fault level impact on Dedisa substation. The Powerships' plant capacity was limited to 600 MW in order to remain within the fault levels below 40 kA at Dedisa 132 kV substation.

Indications are that there are no space constraints around the Dedisa substation and there is sufficient space available to accommodate the required two or three 132 kV feeder bays to connect to the Powerships. However, this information will need to be confirmed by Eskom through a formal Grid Connection Application process. The

connection solution to Dedisa at 132 kV voltage level with its lower connection cost and shorter implementation timeframes offers the most practical alternative.



Figure 3-6: Alternative 1: Power Evacuation Route

Figure 3-6 as per the red line is the preferred option (Alternative 1) from an engineering perspective. Figure 3-7 presents, as per the yellow line is the second option (Alternative 2) for the proposed power evacuation route.

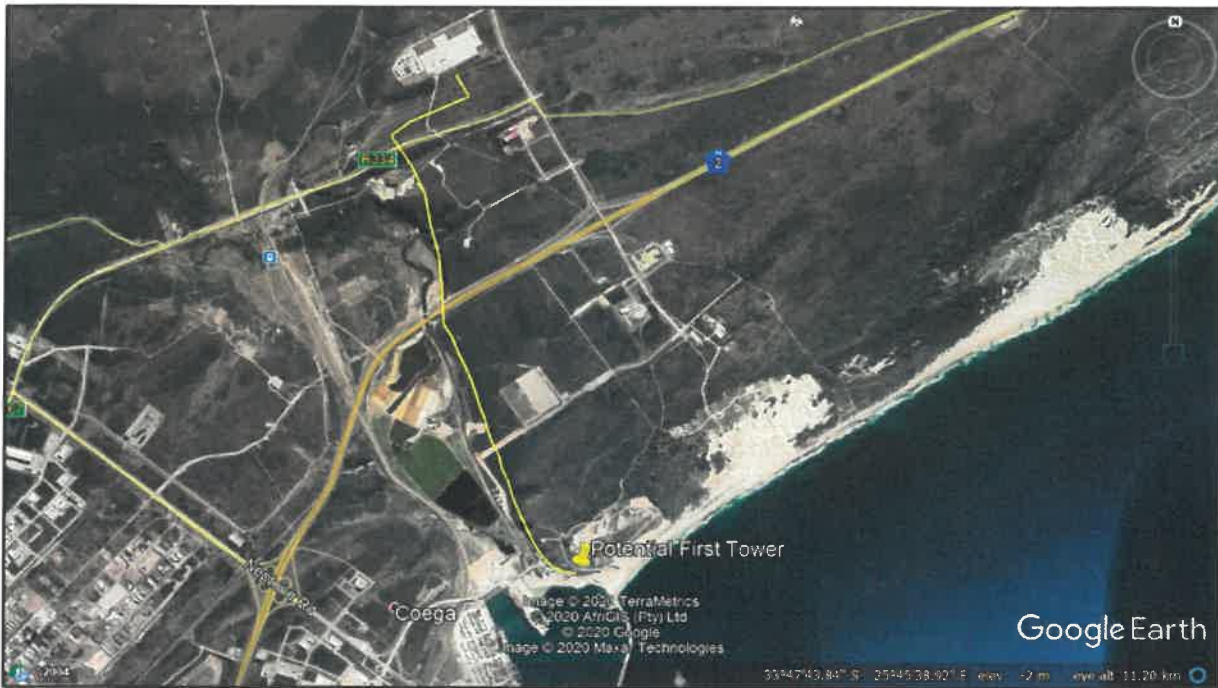


Figure 3-7: Alternative 2: Power Evacuation Route

Transmission Line Route Alternatives:

Alternative A1 (preferred activity alternative)

Alternative A2 (if any)

Size of the site/servitude:

| |
|-------------------------------------------------------------|
| 7km with 30m servitude = 210 000m ² (approx.) |
| 7km with 30m servitude = 210 000m ² (approx.) |

Alternative 3 - a third layout alternative might be identified to accommodate minor changes, based on specialists' final input, and will be addressed in the EIA phase.

The steel lattice option has a footprint of 15mx15m. The monopoles ranges from 0.6m x 0.6m to a maximum of 2.5m x 2.5m. In addition, the proposed lattice steel / monopoles towers will include bird friendly measures as part of the designs.

The table below show the GPS co-ordinates for the of the start and end points of the transmission lines – from the powerships (as per Alternative 1 and 2 only) to the start point, as well as from the start point to the end point (Alternative 1 and Alternative 2 only). A third alternative route for the transmission line has been identified to accommodate the feedback from the specialists, stakeholders and Interested and Affected Parties. This will only be addressed in the EIA phase.

Table 3-2: Coordinates for the Transmission line, including alternatives

| Transmission line | GPS-COORDINATE | |
|------------------------------------------------------------------------------|----------------|----------------|
| | Longitude | Latitude |
| From Khan Class and Shark Class to first tower (Alternative 1) - Start point | 33°47'47.06"S | 25° 41'25.07"E |
| From Khan Class and Shark Class to first tower (Alternative 1) - End point | 33°47'39.77"S | 25° 41'33.27"E |
| From Khan Class and Shark Class to first tower (Alternative 2) - Start point | 33°47'55.05"S | 25° 41'40.04"E |
| From Khan Class and Shark Class to first tower (Alternative 2) - End point | 33°47'42.31"S | 25° 41'38.18"E |
| Transmission Line Alternative 1 - Start point | 33°47'42.15"S | 25° 41'38.25"E |
| Transmission Line Alternative 1 - End point | 33°44'37.81"S | 25° 40'35.89"E |
| Transmission Line Alternative 2 - Start point | 33°47'40.24"S | 25° 41'33.18"E |
| Transmission Line Alternative 2 - End point | 33°44'39.81"S | 25° 40'40.87"E |

Gas Pipelines Alternatives

A gas line is required between the FSRU and Powerships to ensure gas supply for power generation.

The gas pipeline connecting the FSRU to the Powerships will be routed along the edge of the existing eastern breakwater and will connect to the vessels via a flexible marine hose. The gas pipeline will likely be mounted on small footings requiring minor civil works to be constructed and installed. There are two proposed alternative routes for the gas pipeline, and these are directly influenced by the selected positions of the Powerships in relation to the position of the FSRU.

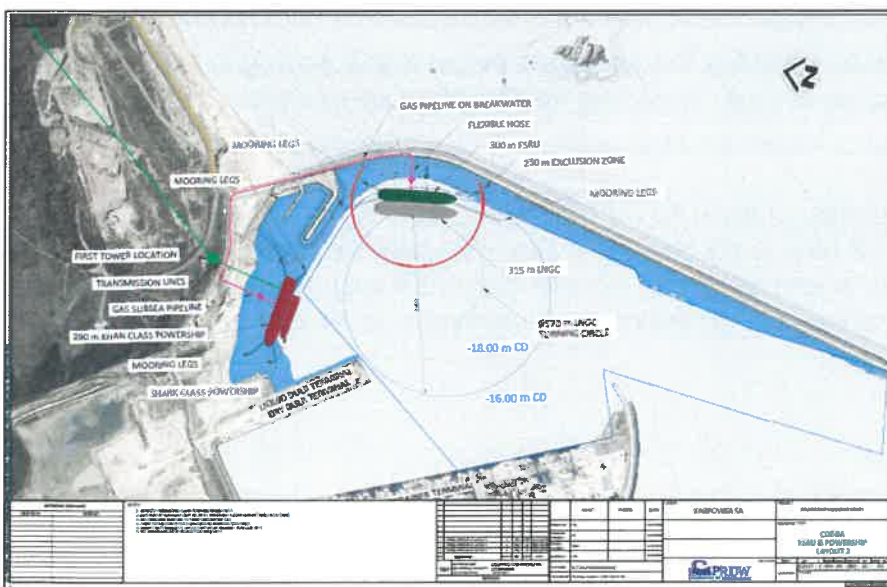


Figure 3-8: Alternative 1 – gas pipeline route (Pink Line)

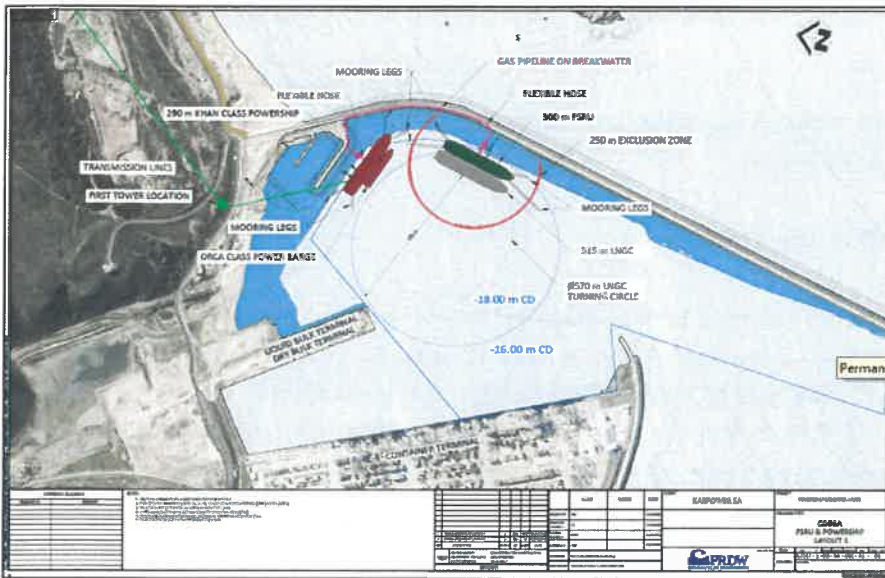


Figure 3-9: Alternative 2 –gas pipeline (Pink Line)

Alternative 1 of the gas pipeline route (Figure 3-8) is preferred from an engineering perspective, as it is in line with the preferred position (from an engineering design perspective) of the Powerships and the FSRU within the Port, positioning the Powerships in closer proximity to the land and the transmission line (Powerships position – Alternative 1). Alternative 2 of the gas pipeline route (Figure 3-10) is aligned to the second alternative of the Powerships positions (further from the shore) and the FSRU. Although this alternative presents a shorter gas pipeline, the position of the Powerships in relation to the shore are not supported from an engineering perspective, and therefore the associated gas pipeline is not supported from the engineering design perspective.

Gas Pipeline Route Alternatives:

- Alternative A1 (preferred activity alternative)
- Alternative A2 (if any)

Size of the site/servitude:

| |
|-------------------------------------------------------|
| 1.4km with 3m servitude= 4.2m ² (approx.) |
| 0.7 km with 3m servitude= 2.1m ² (approx.) |

(The proposed gas pipeline diameter is 24 inch, equivalent to approx. 60cm (600mm))

Table 3-3: Coordinates for the gas pipelines' alternatives:

| Subsea Gas pipeline | GPS-COORDINATE | |
|------------------------------------------------|----------------|----------------|
| | Longitude | Latitude |
| Gas pipeline Route Alternative 1 - Start point | 33°48'3.84"S | 25° 41'49.63"E |
| Gas pipeline Route Alternative 1 - End point | 33°47'47.06"S | 25°41'25.07"E |
| Gas pipeline Route Alternative 2 - Start point | 33°48'3.84"S | 25° 41'49.63"E |

| | | |
|-------------------------------------------------|---------------|----------------|
| Gas pipeline Route Alternative 2 - End point | 33°47'55.05"S | 25° 41'40.04"E |
|-------------------------------------------------|---------------|----------------|

Alternative 3 - a third layout alternative might be identified to accommodate minor changes, based on specialists' final input, and will be addressed in the EIA phase.

3.1.4 The technology to be used in the activity;

The preferred technology entails Gas Reciprocating Engines, which are connected in series which provide heat to two steam turbines to generate electricity. Combustion engines used for electric power generation are internal combustion engines in which an air-fuel mixture is compressed by a piston and ignited within a cylinder. Dual-fuel engines are designed with the ability to burn both liquid and gaseous fuels. When operating in gas mode, the gaseous fuel is premixed with air, injected just after the compression stroke and ignited by a pilot fuel flame. In this process, the pilot fuel flame acts a "spark plug" to ignite the lean gas-air mixture. Dual-fuel DF engines retain the ability to use a backup liquid fuel when gas supply is interrupted. A flow diagram for combustion engines and a typical bank of engines at a power plant is shown in the figure below.

Electricity will be transferred from the Karpowership Project to the existing sub-station via a dedicated power line.

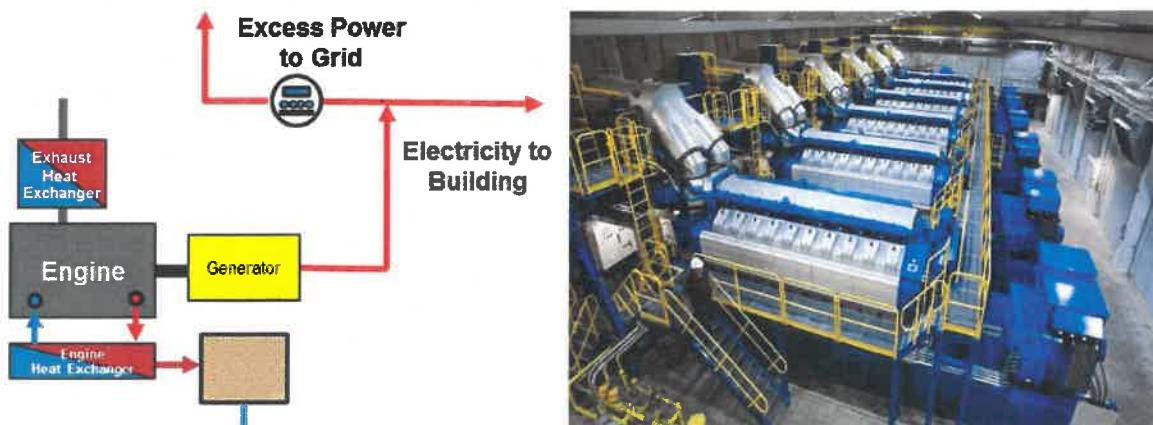


Figure 3-10: A flow diagram for power generation with engines (left), and a bank of engines connected in series

The technology alternative proposed entails the production of electricity through natural gas-fired Combined Cycle Gas Turbine (CCGT) technology.

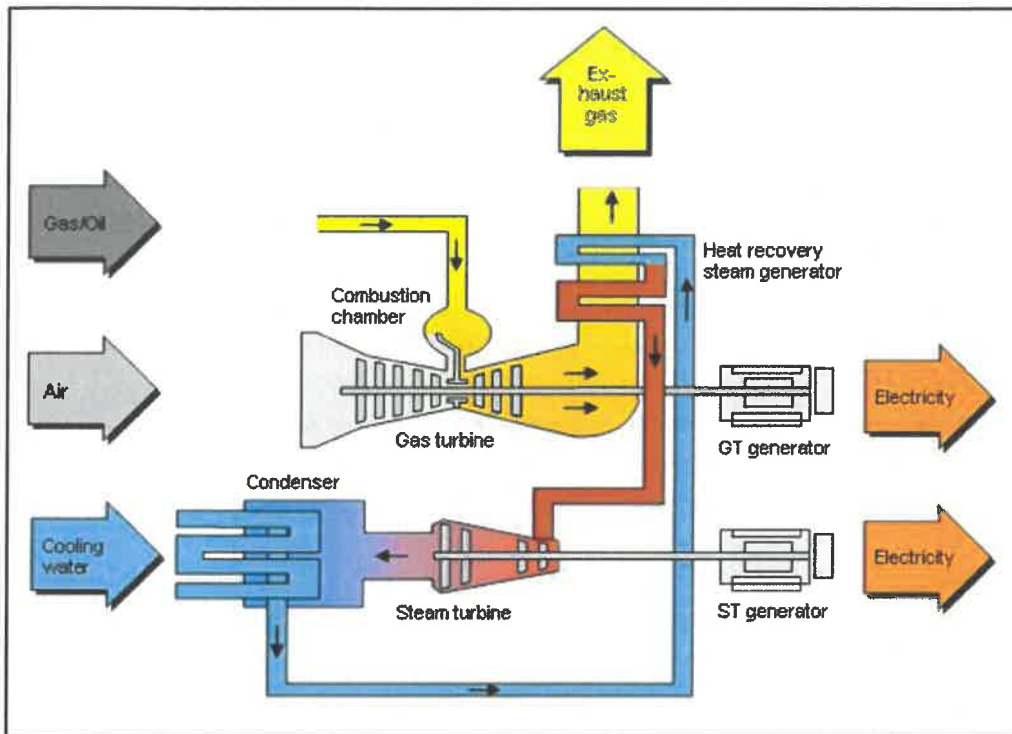


Figure 3-11: Schematic Presentation of a Typical CCGT Process

The preferred Gas Reciprocating Engines technology option will ensure higher efficiency and reliability in electricity generation with overall improved environmental performance compared to traditional coal fired technology. The Powership's Charge Air Systems are designed and equipped with both wet and dry filtration systems, so that Powerships can continue to operate in extreme environments, including the locations where high levels of organic or inorganic dusts exist. Charge air filtering system day to day workmanship or its maintenance intervals may be affected by the pollutant intensity, but operations can continue. The Charge Air Filtering system has proved itself at Guinea Conakry, where the Applicant is operating next to an iron ore exporting harbour.

In terms of construction and footprint, the Powerships are considered to be a complete pre-constructed, purpose-built, offshore power solution, offering several advantages over land based solutions of similar energy generating capacity, e.g. in terms of development footprint and terrestrial impacts.

3.1.4.1 Fuel Alternatives

The Powerships is designed to use Natural Gas, a cleaner burning fuel for the cost effective generation of power, as opposed to coal-fired power stations. In addition, coal-fired power technology is associated with significant air pollution as a result of the coal-fired combustion. Natural gas emits between 45 and 55% fewer greenhouse gas emissions and less than one-tenth of the air pollutants than coal when used to generate electricity (Shell SA, Media Release, 2020).

The Powership engine technology provides for dual fuel usage and is capable of utilizing both Liquid Natural Gas and Heavy Fuel Oils as primary fuel sources. However, for this project, the powerships generation process will use

of internationally sourced LNG gas supply (which will be lawfully sourced). No gas supply is required from local South Africa resources to ensure efficient operations and all other infrastructure will be supplied. The operating fuel for power generation will be from LNG only and will not consume HFO for any part of the generation process. All relevant licenses, permits and approvals are for the consumption and use of LNG only.

3.1.4.2 Liquid Natural Gas (LNG)

According to Shell SA, "Natural gas is the cleanest-burning hydrocarbon, producing around half the carbon dioxide (CO₂) and just one tenth of the air pollutants of coal when burnt to generate electricity. If consumption remained at today's levels, there would be enough recoverable gas resources to last around 230 years. It is versatile. A gas-fired power station takes much less time to start and stop than a coal-fired plant. This flexibility makes natural gas a good partner to renewable energy sources like solar and wind power, which are only available when the sun shines and the wind blows." (<https://www.shell.co.za/energy-and-innovation/natural-gas.html>).

The benefits of running the engine on NG include emission reductions of NO_x, SO_x, CO₂, particulates, no smoke, reduced waste streams to meet the requirements of local or international legislations. LNG has only trace amounts of sulphur, if any. LNG is the cleanest fossil fuel possible, and the combustion of LNG does not result in SO₂ emissions of any significance. Similarly, particulate emissions are very low. The maximum predicted SO₂ concentrations resulting for the proposed project is well below 1 µg/m³.

As reported by the applicant, Ship to Ship (STS) transfers will be undertaken by qualified and experienced operators with experience across numerous operations in the transfer of LNG by STS using internationally agreed and monitored procedures. FSRU senior officers will be similarly experienced as the staff of service providers such as those employed by Fendercare or other non-routine STS providers as the POAC (Person in Over All Charge), working to accredited international standards set by non-governmental organizations such as OCIMF (Oil Company's Marine Forum) SIGTTO (Society of Gas Tanker & Terminal Operators) and ICS (International Chamber of Shipping) with each operation being subject to a due diligence auditing by the shipper of the LNG before an STS takes place. Karpowership and its suppliers all operate to internationally accredited procedures to ensure in country compliance with quality, health and safety at the forefront of any task / action across their entire operations. Operators of FSRU's and LNGC's must comply with comprehensive safety regulations and procedures to protect people from injury and ensure operational safety. Should any LNG be released and spill on water, it is not anticipated to cause harm to the aquatic life or damage the waterways, as LNG vaporizes rapidly in air, becoming buoyant at -110degC and disperses quickly. Similarly, the re-gassified NG, used as fuel in the Powerships, is supplied at ambient temperature. As such, should a release occur, the NG would be much lighter than air and disperses immediately, removing the potential risk of fire.

The use of natural gas to generate electricity, which is what the Powerships technology is designed to do, is the preferred alternative for power generation, and no other technology alternatives are proposed.

3.1.4.3 Heavy Fuel Oil

This section is to add a comparative analysis between Heavy Fuel Oil (HFO) and the proposed project alternative.

HFO is a general term used to describe a range of fuel oils made from the heavier parts of crude oil after the lighter parts are removed to produce petrol, diesel and other light products. The most common technologies used to generate power from HFO are reciprocating engines and gas turbines (CDC, not date).

It is not just the carbon emissions from HFO that are poisonous (Degnarain, 2020). Characteristics of HFO, other than viscosity are also controlled, in particular the inherent levels of sulphur and vanadium. Sulphur levels lead directly to the emission of sulphur oxides (SO_x) from the fuel combustion process, which can have negative health and environmental impacts. HFO is highly concentrated in sulfur (35,000 parts per million) (Degnarain, 2020). Vanadium in combination with sodium can be problematic in engines, causing corrosion to internal components (CDC, not dated). Another by-product is Nitrogen Oxide, which contributes toward air pollution and respiratory disease.

HFO is viscous and sticky consistency, making it more difficult than crude oil to pump or collect during a spill, often fouling habitats for years. HFOs can be particularly difficult to clean up if spilled in the ocean as HFO doesn't readily disperse or breakdown in the marine environment, as it has a tendency to stick to surfaces like sea ice or sink and emulsify in sea water (rather than floating on the surface or evaporating off) (Degnarain, 2020). HFO also remains longer in cooler waters before they have had the chance to evaporate off, making their presence felt for longer. HFO becomes more toxic when exposed to Ultra-Violet (UV) light and can be absorbed by organisms, increasing their mortality (Degnarain, 2020).

3.1.4.4 The operational aspects of the activity; and

The operational aspects are in relation to:

- activity to be undertaken is the development of facilities or infrastructure (assembled off-site and will be delivered fully equipped) for an activity which requires a licence in terms of Section 21 of the NEM: AQA for the generation or release of emissions;
- operation of the Powerships is associated with a ship-based power generating and transmission of energy to land-based transmission connection points;
- operation of the Powerships and FSRU for the storage, or storage and handling of a dangerous good (LNG & NG).

The technology is fixed and thus operational alternatives are limited.

3.1.5 No-Go Alternative activity.

The option of not implementing the activity is also referred to as the "No-go" alternative. In respect of the Project, it would mean that the existing status quo would prevail and that no additional power using this particular technology will be generated and transmitted for inclusion into the energy grid in the Eastern Cape and Nelson Bay Metropolitan Municipality in particular.

The implications of the no-go option will be assessed in the respective specialist studies and their findings will be incorporated into the EIA Report in the next phase of the application process.

4 SITE DESCRIPTION OF SURROUNDING LAND USE

2014 EIA Regulations (as amended), Appendix 2 – 2(1) a scoping report must include (h) (iv) a description of the environmental attributes associated with the alternatives focusing on the geographical, physical biological, social, economic, heritage and cultural aspects;

4.1 TOPOGRAPHY AND BIOPHYSICAL ENVIRONMENT

4.1.1 Eco-region

According to the Department of Water & Sanitation (DWS- 2016), the proposed development falls into the South Eastern Coastal Belt (20) Level 1 Ecoregion (Kleynhans et al., 2005). Level 1 ecoregions are derived primarily from terrain and vegetation, along with altitude, rainfall, runoff variability, air temperature, geology and soil. The description of this ecoregion can be broken down into the following main characteristics:

- Mean annual precipitation: Moderate to high.
- Coefficient of variation of annual precipitation: Low to moderate.
- Drainage density: Low to medium.
- Stream frequency: Low/medium to medium/high in limited areas.
- Slopes <5%: >80% but significant areas <20%.
- Median annual simulated runoff: Moderate to very high.
- Mean annual temperature: Moderate to moderately hot.

Table 4-1: Detailed characteristics of the South Eastern Coastal Belt (20) Level 1 Eco-region

| Main Attributes | Description |
|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Terrain Morphology: Broad division (dominant types in bold) (Primary) | Plains; Low Relief (limited); Plains Moderate Relief; Closed Hills; Mountains; Moderate and High Relief |
| Vegetation types (dominant types in bold) (Secondary) | Dune Thicket; Mesic Succulent Thicket; Valley Thicket; Xeric Succulent Thicket Coastal Grassland; Eastern Thorn Bushveld; Grassy Fynbos (limited); Mountain Fynbos; South and South West Coast Renosterveld; Afromontane Forest; |
| Altitude (above mean sea level – a.m.s.l) | 0-500; 500-1300 limited |
| MAP (mm) | 300 to 1000 |
| Coefficient of Variation (% of annual precipitation) | <20 to 40 |
| Rainfall concentration index | <15 to 30 |
| Rainfall seasonality | All year to very late summer, to winter |
| Mean annual temp. (°C) | 12 to 20 |
| Mean daily max. temp. (°C): February | 22 to 30 |
| Mean daily max. temp. (°C): July | 12 to 22 |
| Mean daily min. temp. (°C): February | 10 to 18 |
| Mean daily min temp. (°C): July | 2 to 10 |

| | |
|--------------------------------------------------------------|------------|
| Median annual simulated runoff (mm) for quaternary catchment | 10 to >250 |
|--------------------------------------------------------------|------------|

(Tripl4 Sustainable Solutions- Wetland Delineation and Functional Assessment, 2020)

4.1.2 Geology

According to 3324 Port Elizabeth-1:250 000 Geological map series (DMEA, 1991) the local geology at the site is characterised by quaternary sands and sandy consolidated sediments associated with the Sondagsriver Group, associated with the Algoa Bay Basin (GCS- Hydrogeology Assessment, 2020).

The Algoa Basin is the most complex half-graben basin, with fully developed graben structures, horst blocks and diagonal faults (Coega and Commando Kraal Faults) cutting the horsts (Lourens, 2013). The Sundays River Formation overlies the Kirkwood Formation and attains a maximum thickness of approximately 1 863 m consisting of grey clays, siltstone and sandstone (GCS- Hydrogeology Assessment, 2020).

The sandstones of the Sundays River Formation are fine-to medium-grained and less porous and permeable than the sandstones of the Kirkwood Formation (GCS- Hydrogeology Assessment, 2020).

4.2 Status of Sub-Quaternary Reach

Desktop information was obtained from DWAF (2013), for the sub quaternary reach (SQR) (M30A-08796) on the Coega River system, which may potentially be affected by the proposed development. The reach spans 72.92 km. The reach is heavily affected by canalization of the river, weirs, roads and bridges which significantly impacted on the instream habitat, water flow, habitat continuity in respect of aquatic invertebrates and fish. Riparian areas have been impacted by agriculture and alien plant infestation. In the lower reaches the estuary has been impacted by salt works, affecting physico-chemical conditions (water quality). Please refer to Table 4-2.

Table 4-2: Present Ecological Status for the Coega River SQR M30A-08796

| Synopsis for SQR M30A-08796 (Coega River) | | | | | |
|---------------------------------------------------|---------|------------------------------------------------|-----------|----------------------------------------------|-----------|
| Present Ecological State | | Ecological Importance | | Ecological Sensitivity | |
| D (Largely Modified) | | High | | Very High | |
| Variable | Status | Variable | Status | Variable | Status |
| Modifications to Instream Habitat Continuity | Large | Fish species per sub quaternary catchment | 12 | Fish Physicochemical sensitivity description | High |
| Modifications to Riparian/Wetland Zone Continuity | Serious | Invertebrate taxa per sub quaternary catchment | 13 | Fish No-flow sensitivity description | High |
| Modifications to Riparian/Wetland Zones | Serious | Habitat Diversity Class | Very High | Invertebrate Physicochemical sensitivity | High |
| Potential instream Modifications | Large | Instream Migration Link Class | Moderate | Invertebrate velocity sensitivity | Very High |

| | | | | | | |
|-----------------------------------------|------|----------|--------------------------------------|----------|----------------------------------------------------------------------|------|
| Potential Modifications | Flow | Moderate | Riparian-Wetland Zone Migration Link | Low | Stream size sensitive to modified flow/water changes description | High |
| Potential Physicochemical Modifications | | Large | Instream Habitat Integrity Class | Moderate | Riparian-wetland Vegetation intolerance to water changes description | Low |

(GCS- Preliminary Aquatic Assessment, 2020)

4.2.1 Rainfall and Evaporation

Mean Annual Precipitation (MAP) and Mean Annual Evaporation (MAE) for the study area, obtained from WR2012, are 434 mm and 1 550 mm, respectively. Since evaporation is significantly higher than rainfall, there will be a net loss of water from the surface. The catchment falls within a summer rainfall area where peak rainfall occurs in November (Figure 4-1).

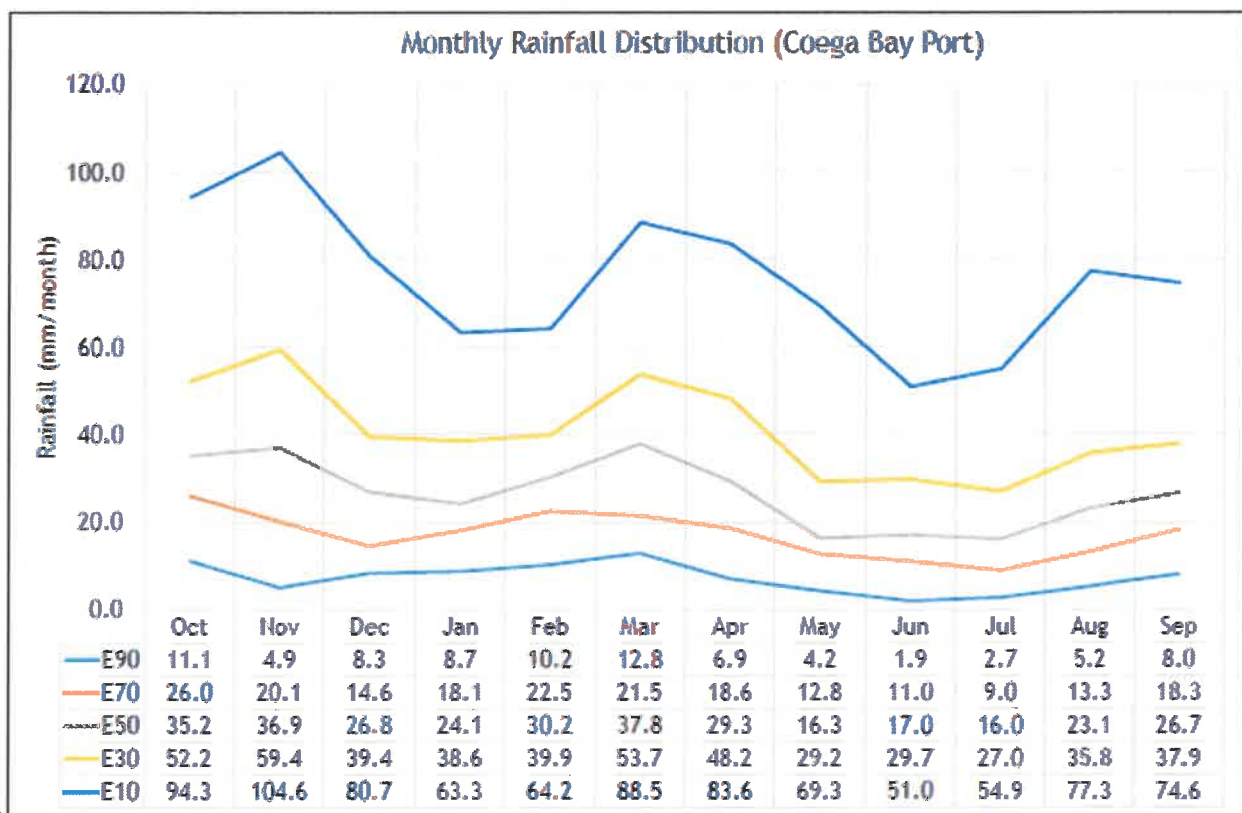


Figure 4-1: Monthly rainfall evaporation distribution for the M30B quaternary catchment

(GCS- Hydrology Assessment, 2020)

4.2.2 Regional Setting, Topography and Sub-Catchment

The site is situated in Quaternary Catchment M30B of the Mzimvubu-Tsitsikamma (DWS, 2016) Water Management Area (WMA 7).

The site is bound to the west by the Coega River (approx. 1.5 km downstream). Several non-perennial (ephemeral) streams drain the site (with the preferred transmission line route falling outside these streams). Elevations on the site typically range from 0 to 60 metres above mean sea level (amsl). Thickets, bare soil, bushes, scattered thickets, low shrubs and bush dominate the subcatchment (DEA, 2019).

4.2.3 Climate

The Köppen Climate Classification suggest Coega Bay is situated in a hot desert climate (class= BWh) which receives rainfall in winter months (Kottek, Grieser, Beck, Rudolf, & Rubel, 2006). MAP is in the order of 434 mm/annum and the MAE in the order of 1 550 mm/a (S-Pan) (WRC, 2015).

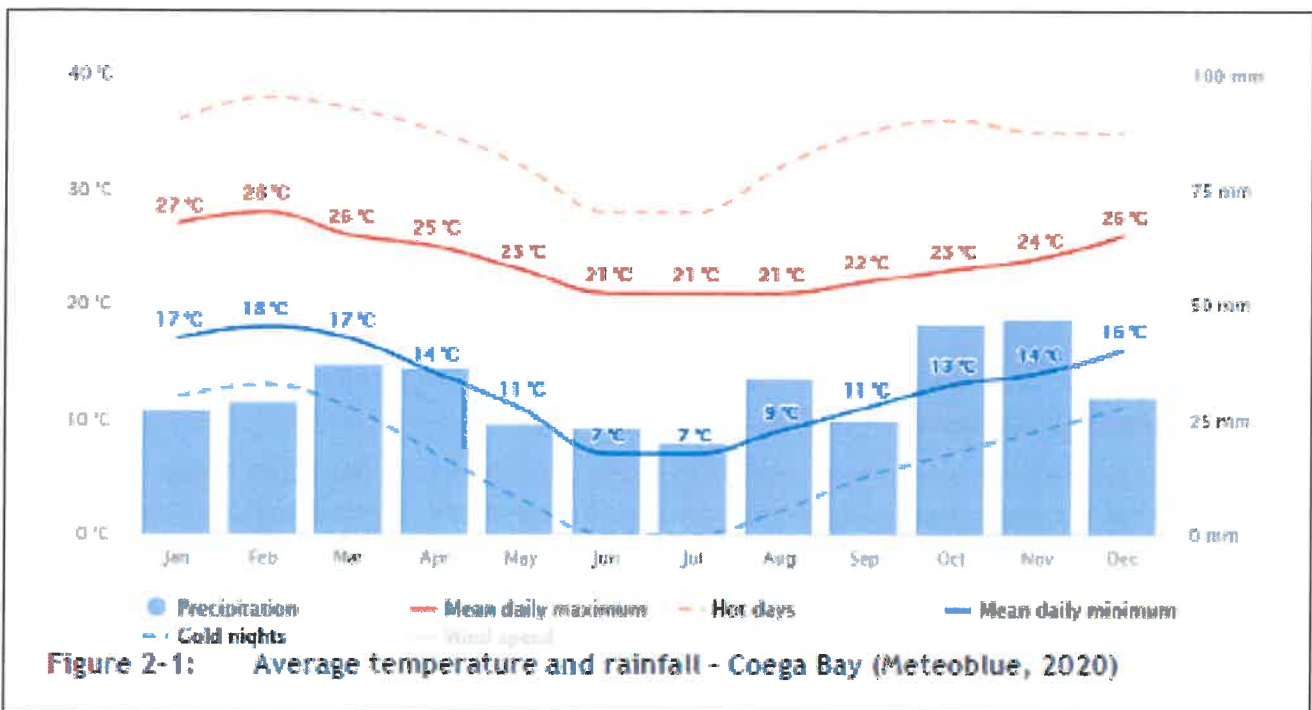


Figure 4-2: Average temperature and rainfall

(GCS- Hydropedology Assessment, 2020)

4.2.4 Soils and land morphology

According to the Land types of South Africa databases (ARC, 2006), the soils in the project area fall within Fc369 (shallow soils predominate; usually lime throughout much of landscape) land types (GCS- Hydropedology Assessment, 2020).

The dominant soil moisture regime in these soils is one of free drainage and recharge of lower fractured rock layers (deep percolation). The degree of recharge depends on the extent and connectedness of fracturing in the underlying

geology. Due to the dominance of rapid percolation through the fractured rock material signs of redox morphology are generally lacking except in cases where climate and the flow regime conspire to yield prolonged periods of wetness and saturation (GCS- Hydrogeology Assessment, 2020). Under such conditions, the presence of redox morphology is accommodated at the family level in the Glenrosa form (Der Waals, 2019). Therefore, these landscapes do not have a clear expression of wetland conditions as a rule, but specific cases may prove otherwise during detailed investigations. However, due to the “water capturing” function that rocky and shallow soils play they invariably contribute to the expression of wetness and wetlands further down the slope (GCS- Hydrogeology Assessment, 2020). In this regard in arid landscapes, the accumulation of lime in lower-lying landscape positions may indicate the preferential flow paths and hydrology even though these signatures do not qualify as wetlands per se (Job, et al., 2019).

4.3 GEOHYDROLOGY

4.3.1 Aquifer characteristics, classification and groundwater recharge

The aquifers underlying the site consist out of unconsolidated and consolidated sand, underlain by competent rock (sandstone) of the Uitenhage Series. The aquifer has a low to medium hydraulic conductivity (K-value) and porosity (n-value). The aquifer can be referred to as being primarily fractured, with intergranular occurrences associated with the sand deposits (King, Maritz, & and Jonck, 1998). The aquifer’s weathered zone is reported to be approx. 94 m thick, with the fractured zone approx. 127m thick (DWAF, 2006). The combined aquifer thickness is estimated to be in the order of 222 m (GCS- Geohydrological Assessment, 2020).

Recharge to the underlying aquifer is estimated to range from 1.7 to 2.5% which falls within quaternary catchment M30B (DWAF, 2006). The aquifer is an important contributor to groundwater baseflow to streams and rivers (King, Maritz, & and Jonck, 1998).

4.3.2 Depth to groundwater

According to DWAF (2006), the groundwater depth on a quaternary scale is in the order of 25.8 mbgl. WRC (2015) data suggest that the groundwater table ranges from 1 to 26 mbgl, for the sub-catchment associated with the development site. Shallower groundwater levels will typically be associated with low lying areas surrounding the Coega River, or areas where clay lenses occur (i.e. perched groundwater). Literature further suggests that the groundwater table mimics the surface topography.

4.4 FAUNA AND FLORA

4.4.1 Vegetation types

According to Mucina and Rutherford, there are four vegetation types within the site: Sundays Thicket (AT 6), Coega Bontveld (AT 7), Algoa Dune Strandveld (AZs 1) and Cape Seashore Vegetation (AZd 3) (Preliminary Terrestrial Ecological Assessment, 2020). In this case, the vegetation mapped by Mucina and Rutherford (2018) and Subtropical Thicket Ecosystem Programme (STEP) is true to the vegetation on the ground (Preliminary Terrestrial Ecological Assessment, 2020). The Coega Open Space Management Plan (OSMP) also increases the detail of the mapping of the area of mesic succulent thicket and, to a lesser extent, bontveld of the site (Preliminary Terrestrial Ecological Assessment, 2020). Overall, over 150 plant species were recorded from the site, with other species yet to be identified (Preliminary Terrestrial Ecological Assessment, 2020).

Some Species of Conservation Concern (SCC) recorded from the site include over 35 species of succulent, many of which are protected. There is also a presence of (over 20 individuals) population of *Euphorbia obesa*. Aliens occur throughout the site, primarily due to disturbance occurring as part of the Industrial Development of the area. Some recorded species include *Opuntia ficus-indica* and *Acacia longifolia*.

4.4.2 Critical Biodiversity Area (CBA)

According to the Eastern Cape Biodiversity Conservations Plan (ECBCP), the study site is located primarily within CBA1 or CBA2 (Preliminary Terrestrial Ecological Assessment, 2020). This, according to guidelines, falls within Biodiversity Management Classes (BLMC 2): Near Natural Landscapes and should be managed to maintain biodiversity in near natural state with minimal loss of ecosystem integrity with no transformation of natural habitat permitted (Preliminary Terrestrial Ecological Assessment, 2020). Subtropical Thicket Ecosystem Programme (STEP) Conservation status shows that most project area and both preferred and alternative routes are situated in a Currently Not Vulnerable area, and this area can withstand some development. However, a portion of both routes is located in a Vulnerable area and a section of the alternative route is located within a Critically Endangered area. Limited development can occur within Vulnerable areas but absolutely no development should be considered in Critically Endangered areas (Preliminary Terrestrial Ecological Assessment, 2020).

The study area is located outside of any Threatened Ecosystems but Albany Alluvial Vegetation, an Endangered ecosystem is located within 5km of the site (Preliminary Terrestrial Ecological Assessment, 2020). The closest protected area is the Addo Elephant National Park Marine Protected Area which includes Saint Croix Island off the coast less than 5km away from the study site (Preliminary Terrestrial Ecological Assessment, 2020). The Algoa Bay Islands: Addo Elephant National Park IBA is located within 5km of the site, just offshore (Preliminary Terrestrial Ecological Assessment, 2020).

Table 4-3: CBA Descriptions (ECBCP: SANBI, 2007)

| Category | Code | Features used to define categories |
|------------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Protected Areas: | | |
| Protected Area 1 | PA1 | Statutory protected areas. They include all national parks and provincial nature reserves. |
| Protected Area 2 | PA2 | Non-statutory protected areas: municipal and private conservation areas. |
| Terrestrial Critical Biodiversity Areas | | |
| Terrestrial CBA 1 | T1 | Critically endangered vegetation types (ecosystems) identified through ECBCP the systematic conservation assessment |
| | | Critically endangered vegetation types from STEP |
| | | Critically endangered forest patches in terms of the National Forest Assessment |
| | | Areas essential for meeting biodiversity targets for biodiversity features (SA vegetation types, expert mapping priority areas) |
| | | KZN systematic conservation planning priorities |
| | | Forest clusters identified as critical in the forestry planning process. |
| Terrestrial CBA 2 | T2 | Endangered vegetation types identified through the ECBCP systematic conservation assessment |
| | | Endangered vegetation types from STEP |
| | | Endangered forest patches in terms of the National Forest Assessment |
| | | All expert-mapped areas less than 25 000ha in size (includes expert data from this project, STEP birds, SKEP, Wild Coast, Pondoland and marine studies) |
| | | All other forest clusters (includes 500m buffers) |
| | | 1km coastal buffer strip |
| | C1 | Ecological corridors identified in other studies (e.g. from STEP, Wild Coast, Pondoland, WMA 12 AEA, etc.) and corridors mapped by experts. |
| | C2 | Ecological corridors identified by the ECBCP using an integrated corridor design for the whole province. |

4.4.1 Eastern Cape Biodiversity Conservation Plan (ECBCP)

The Eastern Cape Biodiversity Conservation Plan identifies areas within the Eastern Cape that require conservation, and supplies land use guidelines for the province based on conservation values (Berliner et al 2007 via Preliminary Terrestrial Ecological Assessment, 2020). According to the Eastern Cape Biodiversity Conservation Plan (ECBCP), the study site is located primarily within CBA1 or CBA2. This, according to guidelines, falls within BLMC 2: Near Natural Landscapes and should be managed to maintain biodiversity in near natural state with minimal loss of ecosystem integrity with no transformation of natural habitat permitted.

4.4.2 Local – Coega Open Space Management Plan

Department of Environment, Forestry, and Fisheries (DEFF) approved the Coega Open Space Management Plan (OSMP, 2014) which focuses on spatial information categorising various land uses as open spaces and CBAs. The primary objectives of this tool is to preserve, manage and protect those environments where natural systems require it. Since this tool is a mandatory requirement, the data will be used to inform the specialist report information contained in this report.

4.4.3 Subtropical Thicket Ecosystem Programme (STEP)

The Subtropical Thicket Ecosystem Programme or STEP is a bioregional programme for the area where thicket is the dominant vegetation type, predominantly in the Eastern Cape (Pierce & Mader 2006). The function of STEP is to promote the sustainable management of the biodiversity of the region, as much of it is under pressure from poorly planned development. This programme was considered for the Preliminary Terrestrial Assessment.

4.5 Watercourses, including Wetlands

4.5.1 Water Management Areas

The proposed development falls within the Water Management Area (WMA): Fish to Keiskamma, which falls under the lesser sub-WMA's: Algoa and the quaternary catchment M30B. The aforementioned WMA is drained by several parallel rivers which flow in an easterly direction and eventually discharge into the Indian Ocean. The rivers which contribute to the highest flow within this WMA are the Fish, Kowie, Boesmans, Sundays, Gamtoos, Kromme, Tsitsikamma and Groot rivers with several smaller coastal rivers that feed the aforementioned larger rivers (DWA, 2003 via the Wetland Delineation and Functional Assessment, 2020).

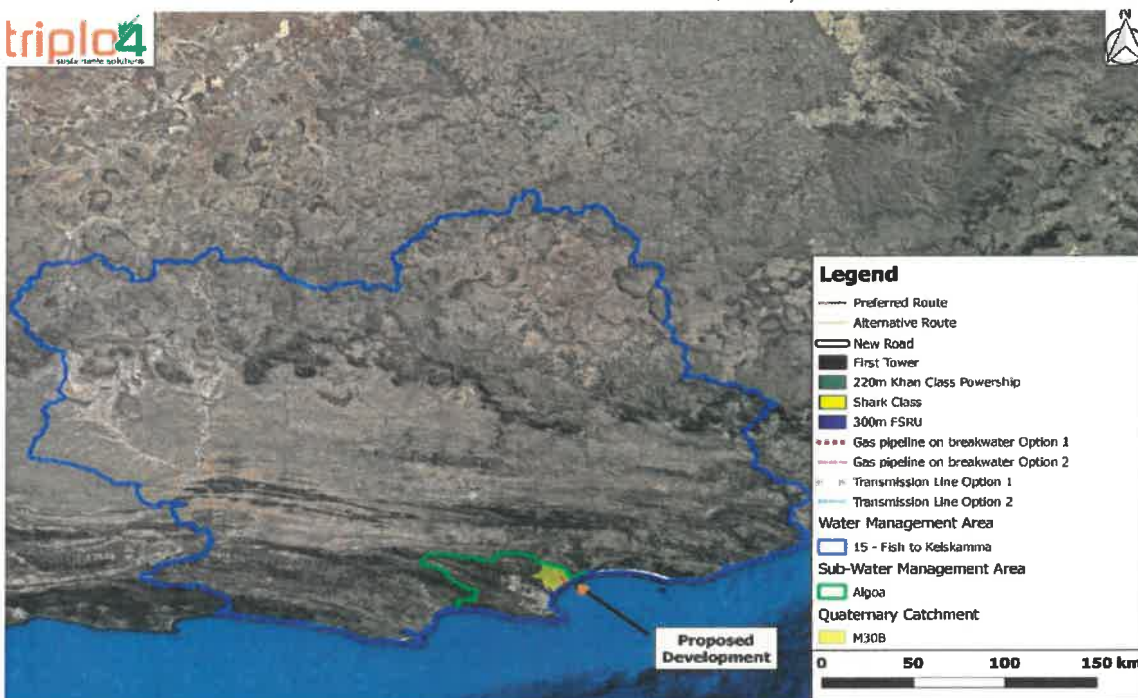


Figure 4-3: Map of the WMA, sub-WMA and Quaternary Catchment that fall within the proposed development

4.5.2 National Freshwater Ecosystem Priority Areas (NFEPA)

The National Freshwater Ecosystem Priority Areas (or NFEPA), are rivers, wetlands and estuaries which have been identified as systems of strategic importance to the hydrological functioning of South Africa. These systems have been identified using scientific methodologies as well as consensus amongst researchers, government entities and the general public (Nel et al., 2011).

According to the NFEPA dataset, a FEPA natural valley floor wetland will be at risk as a result of the proposed development at a desktop level (Nel et al., 2011). However, due to the construction of the Ngqura Port, the aforementioned wetland does not exist anymore and it is currently dredged Port area. Furthermore, the FEPA Estuary is approximately 200m away from the starting point of the alternative transmission route, whereas a natural bench is approximately 480m away from the end connection point (Dedisa Substation), in an easterly direction from the Dedisa Substation. The aforementioned wetlands were considered to not be at risk.

4.5.3 Delineated watercourses and watercourse at risk

A total of five watercourses were delineated of which one was classified as a degraded estuary/Port waters, two as depression wetlands and two as A channel streams (see section 4.2 for explanation of classification of riverine systems). During the initial risk assessment screening, it was determined that one of the wetlands (Rip01) was a **moderate risk** as a result of potential indirect impact from the proposed development. Features which calculated a risk in the initial risk assessment were assessed further using the appropriate assessment tools/methods.

4.6 CONSERVATION AND PLANNING TOOLS

4.6.1 DEFF Screening Tools

The table below provides a summary of the DEFF Screening Report of the proposed site.

Table 4-4: Powerships & Transmission Lines- Environmental sensitivities identified by the DEFF Screening Report & Proposed Way Forward associated specialist requirements

| Variable | Sensitivity | Specialist requirement |
|----------------------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Agriculture | High Sensitivity | The proposed powerships, FSRU and gas pipeline is within the Port of Ngqura and Coega Special Economic Zone. The transmission lines route is proposed along services servitude. No agricultural assessment will be conducted for the proposed sites. |
| Animal Species | High Sensitivity | An ecological assessment will be conducted for the proposed development site. |
| Aquatic Biodiversity | Very High Sensitivity | The presence of any wetlands within the proposed project areas will be confirmed with a site visit. In |

| | | |
|------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | addition, a marine ecology and aquatic assessment will be conducted. |
| Archaeological & Cultural Heritage | High Sensitivity | A Heritage Impact Assessment will be conducted. In addition, the CDC also has a Heritage Management Plan, and guidelines from SAHRA in place to ensure that all aspects of heritage are managed. These recommendations will be included in the EIA. |
| Civil Aviation | Medium | None required |
| Defence | Medium | None required |
| Plant Species | Medium | Findings of species will be included in the ecological assessment |
| Terrestrial Biodiversity | Very High Sensitivity | An ecological assessment will be conducted for the proposed development site. |

4.7 SOCIAL AND ECONOMIC

4.7.1 Socio-Economic

The area falls within the Nelson Mandela Bay Metro Municipality. The local municipality encompasses towns, as well as the Coega Industrial Development Zone, situated near Port Elizabeth.

The Nelson Mandela Bay Metro Municipality covers an area of 1 959 km². The table below provides a summary of the key demographic indicators for the Nelson Mandela Bay (NMB) Metropolitan Municipality in comparison with the Province (Eastern Cape) and South Africa as a whole.

Table 4-5: Demographic Overview

| Demographic Indicators | | Nelson Mandela Bay | Eastern Cape | South Africa |
|------------------------|-------------------------------------|--------------------|--------------|--------------|
| Population | Population 2011 | 1,152,114 | 6,562,054 | 51,770,560 |
| | Population 2016 | 1,263,051 | 6,996,976 | 55,653,654 |
| | Average Annual Growth (2011 - 2016) | 1.9% | 1.3% | 1.5% |
| | Estimated Population 2020 | 1,359,444 | 7,365,578 | 58,968,807 |
| Households | Households 2011 | 335,417 | 1,755,879 | 15,065,018 |
| | Households 2016 | 368,519 | 1,773,396 | 16,923,309 |
| | Average Annual Growth (2011 - 2016) | 1.9% | 0.2% | 2.4% |
| | Estimated Households 2020 | 397,338 | 1,787,535 | 18,573,673 |
| Age (2016) | Under 18 years | 37% | 44% | 38% |
| | 19 - 64 years | 58% | 50% | 57% |
| | Over 64 years | 6% | 5% | 5% |
| Gender (2016) | Female | 51% | 52% | 51% |
| | Male | 49% | 48% | 49% |
| Race (2016) | Black African | 60% | 86% | 81% |
| | Coloured | 24% | 9% | 9% |
| | Indian or Asian | 1% | 0% | 2% |

Final Scoping Report for the Gas to Power Powership Project at the Port of Ngqura and Coega SEZ, EC

| Demographic Indicators | | Nelson Mandela Bay | Eastern Cape | South Africa |
|----------------------------------------|-----------------------------|--------------------|--------------|--------------|
| | White | 15% | 5% | 8% |
| Dwelling Type (2016) | House | 81% | 56% | 66% |
| | Apartment | 3% | 3% | 3% |
| | Traditional | 0% | 27% | 7% |
| | Hose/Flat in backyard | 4% | 4% | 7% |
| | Informal dwelling | 7% | 7% | 13% |
| | Semi-detached & townhouses | 3% | 1% | 2% |
| | Other | 2% | 2% | 2% |
| Access to Electricity (2016) | In-house conventional meter | 11% | 7% | 16% |
| | In-house prepaid meter | 84% | 78% | 74% |
| | No access to electricity | 2% | 11% | 7% |
| | Other source (paid for) | 1% | 1% | 1% |
| | Other source (not paid for) | 1% | 1% | 1% |
| | Other | 1% | 2% | 1% |
| Average Annual Household Income (2011) | No income | 16% | 16% | 15% |
| | Under R5,000 | 4% | 6% | 4% |
| | R5,000 - R10,000 | 6% | 10% | 7% |
| | R10,000 - R20,000 | 16% | 23% | 17% |
| | R20,000 - R40,000 | 17% | 20% | 19% |
| | R40,000 - R75,000 | 13% | 10% | 13% |
| | R75,000 - R150,000 | 11% | 7% | 9% |
| | R150,000 - R300,000 | 9% | 5% | 7% |
| | R300,000 - R600,000 | 5% | 3% | 5% |
| | R600,000 - R1,2 million | 2% | 1% | 2% |
| | R1,2 million - R2,5 million | 0% | 0% | 1% |
| More than R2,5 million | 0% | 0% | 0% | |

(Lumec- Socioeconomic Assessment- input on Demographics, 2020)

The population of NMB grew at 1.9% per annum between 2011 – 2016, which was slightly more than the Provincial and National averages of 1.3% and 1.5% per annum respectively. It is estimated that there are approximately 1,359,000 people living within the area in 2020, which is just less than a fifth (18%) of the population of the Province. Households grew at 1.9% per annum, with the Province experiencing almost no growth over the period and National household growth was 2.4% between 2011 – 2016 (Lumec-Socioeconomic Assessment- input on Demographics, 2020).

The population of NMB is relatively youthful, with almost 40% being under the age of 18 years, which is in par with the National population. The population within the 19 – 64 year bracket (closed available breakdown for NMB to represent the working age of 16-64 years) is 58% in NMB, compared to 50% in the Province and 57% in South Africa (Lumec- Socioeconomic Assessment- input on Demographics, 2020).

In relation to gender breakdown, the split between male and female is consistent across all areas with the population comprising 51% female and 49% male in NMB. In terms of the racial profile, 60% of the uMhlathuze are African, 24% are Coloured and 15% are White, which is significantly different to the Eastern Cape and South African racial split, both which have larger African populations (86% and 81% respectively).

Households in NMB comprise 81% formal houses (significantly greater than the Province and Country as a whole) while informal dwellings were 7%, which is on par with the Provincial average but less than the National figure of

13%. Almost all households have access to electricity in their household (95%), which is more than the Provincial and National averages of 85% and 89% respectively (Lumec- Socioeconomic Assessment- input on Demographics, 2020).

Household income is only available for 2011 but provides an indication of the breakdown across the household population. For NNB and the Province, 16% of households have no income, while around 4% earn less than R5,000 per annum (R400 per month). Only 27% of the NMB population earn upward of R75,000 per annum (R6,000 per month), indicating a small middle and higher-income population. This is however substantially higher than the provincial population of 16%, but only slightly less than the national population of 24% (Lumec- Socioeconomic Assessment- input on Demographics, 2020).

The total GDP of NMB was R120 billion in 2016, which accounted for around 35% of the total Eastern Cape GDP. The main sectors in 2016 were Community Services (24%), Finance (23%), Manufacturing (19%), Trade (17%), Transport (12%) and Construction (4%)²(Lumec- Socioeconomic Assessment- input on Demographics, 2020).

The table below provides the GVA per broad sector in 2016 in Current Prices for NMB, Eastern Cape and SA as a whole, and the contribution of NMB in relation to the Province and Country. The manufacturing sector in NMB contributes over half of the provincial GVA, with transport accounting for almost 45% of Provincial GVA.

Table 4-6: GVA per Sector

| | Nelson Mandela Bay | Eastern Cape | National Total | Nelson Mandela Bay as % of province | Nelson Mandela Bay as % of national |
|-------------------------|--------------------|--------------|----------------|-------------------------------------|-------------------------------------|
| Agriculture | 0.3 | 5.9 | 94.4 | 5.6% | 0.35% |
| Mining | 0.1 | 0.5 | 306.2 | 17.3% | 0.03% |
| Manufacturing | 19.7 | 36.3 | 517.4 | 54.3% | 3.81% |
| Electricity | 1.0 | 6.2 | 144.1 | 16.1% | 0.69% |
| Construction | 3.9 | 13.2 | 154.3 | 29.6% | 2.52% |
| Trade | 18.1 | 61.5 | 589.7 | 29.4% | 3.06% |
| Transport | 12.2 | 27.5 | 389.2 | 44.5% | 3.15% |
| Finance | 24.2 | 60.5 | 781.7 | 39.9% | 3.09% |
| Community services | 25.1 | 89.7 | 894.1 | 28.0% | 2.81% |
| Total Industries | 104.6 | 301.2 | 3,871.2 | 34.7% | 2.70% |

Source: IHS Markit Regional eXplorer version 1156

Source: https://www.ecsecc.org/documentrepository/informationcentre/nelson-mandela-bay-metromunicipality_31887.pdf

4.8 AMBIENT AIR QUALITY

4.8.1 Air emissions

The maximum predicted annual SO₂, NO₂ and PM₁₀ concentrations and the 99th percentile concentration of the 24-hour and 1-hour predicted concentrations are very low relative to the NAAQS.

² <http://demo.nmbm.co.za/DataRepository/Documents/nmbm-integrated-development-plan-idp-second-edition-2018-19.pdf>

Table 4-7: Maximum predicted ambient annual SO₂, NO₂ and PM₁₀ concentrations in µg/m³ and the predicted 99th percentile concentrations for 24-hour and 1-hour, with the South African NAAQS

| Description | SO ₂ | | |
|------------------------------------|------------------|---------|--------|
| | Annual | 24-hour | 1-hour |
| Predicted maximum SO ₂ | 0.09 | 0.74 | 1.7 |
| NAAQS | 50 | 180 | 350 |
| Description | NO ₂ | | |
| | Annual | 24-hour | 1-hour |
| Predicted maximum NO ₂ | 1.75 | | 33.6 |
| NAAQS | 40 | | 200 |
| Description | PM ₁₀ | | |
| | Annual | 24-hour | 1-hour |
| Predicted maximum PM ₁₀ | 0.43 | 3.65 | |
| NAAQS | 40 | 75 | |

For predicted SO₂, NO₂ and PM₁₀ the highest predicted ambient concentrations occur over the Coega SEZ and within 2 km WNW of the Karpowership Project. The contribution from the Karpowership Project will add to the existing ambient concentrations. The greatest addition will be at the point of maximum with lower concentrations elsewhere in the Coega SEZ. The added effect is small and will not result in exceedances of the NAAQS.

The NEMA EIA Regulations (DEA, 2014a) describe the significance of environmental impacts considering the consequence of the impact and the likelihood of the impact occurring. The consequence of an impact is the sum of the severity of the impact, the duration of the impact and spatial scale of the impact. The rating of these parameters is based on the findings of the assessment and professional judgement of specialists. The likelihood of an impact is the sum of the sum of the frequency of the activity causing the impact and the probability of the impact occurring.

With low predicted ambient concentrations for SO₂ and PM₁₀ the consequence of impacts is very low. The predicted ambient NO₂ are somewhat higher, but the consequence of the impact is low. The likelihood of occurrence of impacts associated with SO₂, NO₂ and PM₁₀ is very low. Therefore, the significance of impacts resulting from the Karpowership Project is predicted to be very low. The consequence and likelihood scores listed in Table E4 for the Karpowership Project with the Project adding to existing ambient concentrations, showing the impact significance.

4.9 MARINE & COASTAL ENVIRONMENT & CLIMATE CHANGE

4.9.1 Coastal Environment & Geomorphology

The port of Ngqura is a relatively modern port and is the only port in South Africa to have been subjected to environmental legislation throughout its design, construction and operational phases (Thermis Environmental-Coastal Impact Assessment, 2020). The broader area has been subjected to substantial beach erosion in the past, largely due to intentional vegetation of headland bypass dunes at Cape Recife with alien invasive species historically, and by the construction of a sewage works within the dune field (Thermis Environmental-Coastal Impact Assessment, 2020). Sediment management aspects were therefore at the forefront of the environmental agenda when the port was designed and authorised (Petterson 2019).

Like most ports located along relatively straight, sandy coastlines, Ngqura would effectively block the natural eastward littoral drift causing severe sediment accretion to the west of the port and beach erosion to the east (Thermis Environmental- Coastal Impact Assessment, 2020). Beyond the beach impact, dune fields fed by windblown sand from the beaches would also exhibit sedimentary changes (Thermis Environmental- Coastal Impact Assessment, 2020). In the long term, accretion on the western end of the port would increase along the wall until sediment bypassed and filled the harbour mouth by wave transport, and sediment supply to the dune field that would naturally run behind/through the port would also build up until the port is bypassed (Thermis Environmental- Coastal Impact Assessment, 2020). Maintenance of this port would therefore require constant removal of dune sands and constant dredging of the harbour mouth.

The entire harbour is also included in the estuarine functional zone of the Coega Estuary, which has been highly modified.

4.9.2 Marine Ecology

The ecoregion is characterised by high biodiversity and hosts the largest number of South African endemic species (Sink et al. 2019). It is predominantly influenced by the Agulhas Current and periodic upwelling that can occur (primarily northeast of the port near Port Alfred).

The port and its immediate surroundings host a number of ecologically important and sensitive habitats. These include:

- The Addo Elephant National Park Marine Protected Area which is important for marine conservation, particularly the conservation of seabirds where the islands provide important breeding habitat. The MPA borders the eastern breakwater of the Port of Ngqura and Jahleel Island, which forms a part of the St Croix Island group, is less than 1 km away from the proposed FSRU mooring location.
- The water body in the port that supports ecological processes that sustain the biological communities of the system, including a range of fish species and penguins. The port water body provides important seasonal habitat for neonate and juvenile dusky sharks (Dicken 2011).
- The breakwaters within the port which mimic intertidal and shallow subtidal rocky shorelines and are biodiverse (Dicken 2010).

To reduce the risk of recirculation of the discharge back to the intakes, it is recommended that the discharge pipeline running down the vessel hull has a second elbow to discharge horizontally away from the vessel, and that the discharge pipes be positioned as far from the intakes as possible. Furthermore, PRDW (Consulting engineers) indicate that from the outlet of the discharge, the water temperature is higher but at the 300m from the vessel the water temperatures are within 1 degree of ambient.

Based on previous thermal plume modelling studies undertaken by PRDW (Consulting Port and Coastal Engineers), and considering the proposed Powerships locations in the Port and the proposed flow rates and ΔT 's, it is anticipated that the generic ecological thresholds will be exceeded in most cases and that site-specific thresholds will need to be established by a marine ecologist, along with mitigation measures. Examples of mitigations include running at a reduced load and without the steam generators, discharging deeper below the surface to improve initial dilutions, moving the Powerships to a location with improved mixing capacity or further from sensitive receptors, or piping the cooling water to a location with improved mixing capacity. The altered temperatures may affect biological

communities and linked ecology processes that sustain the existing natural conditions within port water bodies. Dr Robin Carter of Lwandle Marine Environmental Services provided the following preliminary comments:

The environmental risks may comprise:

- Entrainment and mortality of holoplankton, meroplankton and ichthyoplankton in the power ship cooling water intake.
- Sublethal and lethal effects of increased seawater temperatures in the cooling water discharge plume as it mixes with the receiving environment seawater body.
- Modification of seawater temperatures in the receiving water body as a whole and modifications of the hosted biological communities and ecology.

The magnitude of these risks are site specific to an extent. Effects from cooling water discharge plumes will be important in all of the ports, but to a lesser extent in the Port of Ngqura. This is a predominantly artificial system as opposed to the other ports that are housed in what were natural embayment or estuarine systems. However, since its inception Ngqura has become important as a regional nursery area for dusky shark (*Carcharhinus obscurus*) that prey on mainly fish in and around the port area. Severe temperature elevations can disrupt these populations. Further, the port is closely adjacent to the Addo Marine Protected Area which requires careful consideration in the selection of options on cooling water discharge.

Assessment of the risks will be based on processes and rates of seawater intake, temperatures elevations and discharge behaviour. Central to this is simulation modelling by PRDW to demonstrate scales and locales of areas where accepted water quality guidelines for temperature are exceeded. The final mitigation will therefore be determined following the completion of the modelling by PRDW and input from Lwandle Marine Environmental Services.

As per PRDW, mitigation options exist should the modelling indicate areas of exceedances. Karpowership SA Pty Ltd. will be able to adequately mitigate the potential impacts. These mitigations will be incorporated into the development proposal and [during the EIA Phase. Additionally, the avifauna specialist will further assess potential impacts on penguins which will feed into the Marine Impact Assessment.](#)

4.9.3 Climate Change Aspects

Regarding the climate change aspect, the Port of Ngqura site is considered to have a low sensitivity and associated risk with regard to climate change adaptation (Thermis Environmental- Coastal Impact Assessment, 2020). The only notable concern is the increased incidence of extreme storms. These risks are minor because of the nature of the floating infrastructure and its location within the port. Again, the potential for the project to exacerbate existing climate change concerns is low, but cognisance must be taken of the increased fire risk associated with the 8.5km 132KV transmission line as well as the current and projected water stress during the operational phase of the project.

4.10 Cultural Heritage and Palaeontological Resources

The most comprehensive survey of the area was conducted by Binneman (2010), which included Zones 1-4, 6, 7, 9, & 10-13 illustrated in Figure 4-4. Large numbers of Later Stone Age (LSA) shell middens were recorded by Binneman (2010) in Zone 10, while dispersed scatters of Early Stone Age (ESA) and Middle Stone Age (MSA) tools were recorded further inland, and north of the N2 where ancient river gravels are exposed. Binneman (2010) notes

that a large part of the Coega SEZ is located within 5kms of the coast which is a known sensitive and threatened archaeological landscape (Kaplan 1993).



Figure 4-4: Google satellite map of the Coega IDZ, and the approximate size of the different zones (Binneman 2010)

Fossils are likely to be encountered within the Project site. Although significant palaeontological material could be found on this site, it is likely to be broken and highly fragmented. Should intact shells be encountered these should be archived and a competent Palaeontologist consulted (Alan Smit Consulting- Palaeontological Report, 2020).

4.11 MARINE TRAFFIC ANALYSIS

A marine traffic analysis is being undertaken to ascertain the effect of LNG vessels, calling at the proposed FSRU mooring in the port, on current and future vessel traffic of the Port of Ngqura. The marine traffic analysis is based on the upper LNG demand estimate of 24 vessel calls per annum.

The Port of Ngqura handles mainly containers, but also occasional general cargo. The average number of traffic vessels calling at the Port of Ngqura for a typical calendar year is approximately 750 vessels (or two per day). The largest number of vessel calls are found in the Super Post Panamax range. All of these were container vessels. The Port of Ngqura operates four container berths and the present or existing vessel traffic activity is dominated by container vessel traffic. The current plan is that the Port of Ngqura will handle container cargoes for the local hinterland and be positioned to handle overflow Gauteng cargoes should capacity in Durban be exceeded. A new manganese export terminal and new liquid bulk facilities are planned for the Port of Ngqura, to be operational in the short-term. This vessel traffic may impact the FPP mooring site in the short term. The powerships and FSRU will be moored on independent spread-moorings.

The impact on existing vessel traffic as a result of the LNG demand estimate of 24 vessel calls per annum is an increase in vessel traffic by 3%. The vessel call estimate for the short term is being carried out to determine the trends in the increase in vessel traffic over the next seven years and to assess the associated implications for navigational safety. The annual percentage growth in demand is being used to estimate the future vessel traffic for the various cargo handled within the port for the years 2021 to 2028. The effect on future port operations of the LNGC traffic combined with the forecasted future port traffic will then be assessed. Additionally, the effect on current and future port operations with respect to navigation of traffic vessels past the FPP site and FSRU mooring is being assessed.

4.12 NOISE

The proposed project site is within the Port of Ngqura. The site borders a Marine Protected Area that is within the Addo Elephant National Park. The Marine Protected Area could be impacted by the surface noise as well as the underwater noise from the vessel operations (transmission through the hull, propellers, sonar ranging devices etc.).

The current ambient sound level varies from approximately 35 dBA to 65dBA. This is dependent upon the weather, time of day and any human activity such as shipping etc. in the area. A more detailed study will be conducted in the EIR phase.

The most applicable standard for planning purposes used in this study is SANS 10103:2008 which provides typical rating levels for noise in various types of districts. Ideally, in such areas one does not want to experience any anthropogenic noise pollution.

SANS 10103:2008 provides typical rating levels for noise in various types of districts, as described in Table 1 below.

Table 4-8: Typical rating level for noise in various district types.

| Type of District | Equivalent Continuous Rating Level, LReq.T for Noise | | | | | |
|---------------------------------------------------------------------------------------------------|------------------------------------------------------|-----------|------------|------------------------------------|-----------|------------|
| | Outdoors (dB(A)) | | | Indoors, with open windows (dB(A)) | | |
| | Day-night | Daytime | Night-time | Day-night | Daytime | Night-time |
| Rural Districts | 45 | 45 | 35 | 35 | 35 | 25 |
| Suburban districts with little road traffic | 50 | 50 | 40 | 40 | 40 | 30 |
| Urban districts | 55 | 55 | 45 | 45 | 45 | 35 |
| Urban districts with one or more of the following: Workshops; business premises and main roads | 60 | 60 | 50 | 50 | 50 | 40 |
| Central business districts | 65 | 65 | 55 | 55 | 55 | 45 |
| Industrial districts | 70 | 70 | 60 | 60 | 60 | 50 |

The highlighted red font are the rating limits applicable to this project in the Port of Ngqura (Industrial Districts). There are no limits set for Marine protected Areas, and ideally these should be free from anthropogenic noise if possible. The nearest residential areas at Motherwell and Bluewater Bay are possibly too far away to be impacted. This will however be confirmed in the EIA phase.

5 POLICY AND LEGISLATIVE FRAMEWORK

2014 NEMA EIA Regulations (as amended), Appendix 2- 2(1) a scoping report must include (e) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.

5.1 NATIONAL REGULATORY FRAMEWORK

The Constitution, 1996 is the supreme law of the Republic. Any law or conduct inconsistent with it is invalid and the obligations imposed by it must be fulfilled.

- Chapter 2 of the Constitution contains the Bill of Rights, one of which is Section 24 in terms of which everyone has the right to an environment that is not harmful to their health or well-being; and
- to have the environment protected, for benefit of present and future generations, through reasonable legislative and other measures that:
 - prevent pollution and ecological degradation;
 - promote conservation; and
 - secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

One of the key legislative measures that has been established is the promulgation of the National Environmental Management Act 107 of 1998 (NEMA). NEMA aims to provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state; to provide for certain aspects of the administration and enforcement of other environmental management laws; and to provide for matters connected therewith.

NEMA prohibits a person from commencing a listed activity without environmental authorisation. The Project triggers several activities listed in the EIA Regulations Listing Notices 1, 2 and 3 of 2014 (as amended). The procedural requirements for such an application and associated EIA that needs to be undertaken, are prescribed by the EIA Regulations, 2014 (as amended) (the EIA Regulations, 2014) and informed by guidelines published in terms of Section 24J of NEMA as well as applicable protocols and minimum information requirements.

In addition, the Project triggers an activity listed under the National Environmental Management: Air Quality Act 39 of 2004 (NEMAQA) which requires an atmospheric emission licence (AEL). The same EIA process prescribed by the EIA Regulations, 2014 need to be applied to the AEL application, with a number of additional requirements set out in NEMAQA and its Regulations.

As part of the EIA process, the EIA Regulations require that a description of the policy and legislative context within which the development is proposed is reported on in the Scoping Report. This includes an identification of all applicable legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments. This section has been prepared to satisfy this requirement.

5.1.1 National Environmental Management Act (No 107 of 1998 [as amended])

| Legislation | Section | Relates to |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| National Environmental Management Act (No 107 of 1998 [as amended]) | Section 2 | Contains sustainable development and other principles that apply throughout South Africa to the actions of all organs of state that may significantly affect the environment. |
| | Section 24 | Provides for the prohibition, restriction and control of activities which are likely to have a detrimental effect on the environment. |
| | Section 28 | The developer has a general duty to care for the environment and to institute such measures as may be needed to demonstrate such care. |
| | Section 30 | Deals with the control of emergency incidents, including the different types of incidents, persons responsible for the incidents and reporting procedures to the relevant authority. |
| Relevance to the Proposed Project: | | |
| <p>Three sets of listed activities, published 4th of December 2014 (w.e.f 8 December 2014) under Government Notices R.983, R.984, and R.985, and subsequently amended, describe the activities that require either a Basic Assessment (applies to activities in Listing Notices 1 and 3)), or Scoping and Environmental Impact Reporting (S&EIR) (applies to activities in Listing Notice 2)). All listed activities that are triggered in the above listing notices need to be assessed in the assessment report – refer to Section 2.2.</p> <p>Because the Project triggers activities in Listing Notice 2, the application for environmental authorisation is subject to the S&EIR process for all activities, including those listed under Listing Notice 1 and 3. As set out by Section 24C of the NEMA, the relevant competent authority for this activity is DEFF.</p> <p>The applicable 24J Guidelines include:</p> <ul style="list-style-type: none"> • Department of Environmental Affairs (2017), Public Participation guideline in terms of NEMA EIA Regulations, Department of Environmental Affairs, Pretoria, South Africa. • DEA (2017), Guideline on Need and Desirability, Department of Environmental Affairs (DEA), Pretoria, South Africa | | |

5.1.2 National Environmental Management: Waste Act (No 59 of 2008)

| Legislation | Section | Relates to |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------|
| National Environmental Management: Waste Act (No 59 of 2008) | Sections 16 – 18, 21 – 27, 35 – 41, 60 | Provides for general and specific waste management measures; the remediation of contaminated land and reporting. |
| | Sections 19, 20, 43 - 59 | Requirements for waste management licensing |
| Relevance to the Proposed Project: | | |
| <ul style="list-style-type: none"> ▪ All reasonable measures must be taken to avoid the generation of waste and where such generation cannot be avoided, minimise the toxicity and amounts of waste that are generated; reduce, re-use, recycle and recover waste; where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner; | | |

- Manage the waste in such a manner that it does not endanger human health or the environment or cause a nuisance through noise, odour or visual impacts;
- Prevent any employee or any person from contravening this Act; and prevent the waste from being used for an unauthorised purpose;
- The proposed development does not trigger any listed activities (under Categories A and B) of this Act and as such does not require a Waste Licence.

5.1.3 National Environmental Management: Air Quality Act (No 39 of 2004)

| Legislation | Section | Relates to |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------|
| National Environmental Management: Air Quality Act (No 39 of 2004) | | Provides for the protection of the environment by regulating air quality in order to prevent air Pollution. |
| | Sections 22, 21 22A | Atmospheric Emission Licensing. |
| | Sections 23-25 | Controlled emitters |
| | Section 32 | Control of dust |
| | Section 34 | Control of noise |
| | Section 35 | Control of offensive odours |
| Relevance to the Proposed Project: | | |
| <ul style="list-style-type: none"> ▪ The proposed project requires an Atmospheric Emission Licence. ▪ It is likely that the steam turbines will be regulated as controlled emitters. | | |

5.1.4 Marine Living Resources Act (Act 18 of 1998 amended 2000)

| Legislation | Section | Relates to |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Marine Living Resources Act (Act 18 of 1998) amended 2000 | | Regulates the utilization, conservation and management of marine living resources and the need to protect whole ecosystems preserve marine biodiversity and minimize marine pollution. |
| Relevance to the Proposed Project: | | |
| The main implication of this act is the sustainable utilisation of marine resources. Due to the project being located in the Port of Ngqura, all reasonable measures must be taken to avoid marine pollution to marine living resources. | | |

5.1.5 National Environmental Management: Integrated Coastal Management Act (24 of 2008)

| Legislation | Section | Relates to |
|-----------------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| National Environmental Management: Integrated Coastal Management Act (24 of 2008) | Section 2 | Provides for the protection and to enhance the status of coastal public property, and secure equitable access to the opportunities and benefits of coastal public property. |
| | Section 13 | Persons right of reasonable access to coastal public property as well as the entitlement to use and enjoy coastal public property. |

| | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------------------------------------------------|
| | Section 69 | Stipulate requirements for permits to discharge effluent that originates from a source on land into coastal waters. |
| Relevance to the Proposed Project: | | |
| <p>Discharge of cooled water from the Powership operations from the moored Powerships into the sea, i.e. there is no discharge from land based activities. DEFF has confirmed that a coastal waters discharge permit is not required.</p> <p>Discharge temperatures will conform to the current guideline, the South African Water Quality Guidelines For Coastal Marine Waters, Volume 1, Natural Environment (1995), i.e. the maximum acceptable variation in ambient temperature will not exceed + or - 1°C, in terms of the targeted value for the South African coastal zone.</p> | | |

5.1.6 National Water Act (No 36 of 1998) and Regulations

| Legislation | Section | Relates to |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------------------------------------------------------|
| National Water Act (No 36 of 1998) and regulations | | Regulates the protection, use, development, conservation, management and control of water resources. |
| | Section 19 | Prevention and remedying the effects of pollution |
| | Section 20 | Control of emergency incidents |
| | Section 21 | Permissible water use, including discharge & abstraction and development within 500m of a watercourse (including wetlands). |
| Relevance to the Proposed Project: | | |
| <p>Should the proposed transmission line be constructed within or within close proximity to a watercourse or wetland a water use license may be required for the proposed development. This will be confirmed with the Department of Water and Sanitation and reported on in the EIA Report.</p> | | |

5.1.7 National Forest Act (84 of 1998)

| Legislation | Section | Relates to |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------------------------------------------------------------------------------------------------------|
| National Forest Act (84 of 1998) | Section 12 | Provides for protection, control and licencing for cutting, disturbing, damaging or destroying protected trees |
| Relevance to the Proposed Project: | | |
| <p>If any protected trees in terms of this Act occur on site, the developer will require a licence from the DEFF to perform any of the above-listed activities. In addition, CDC has a permit from DAFF for the removal of protected trees in all developable land within the SEZ. This permit is renewed annually.</p> | | |

5.1.8 National Environmental Management: Biodiversity Act (No 10 of 2004) and the Threatened or Protected Species Regulations (2007)

| Legislation | Section | Relates to |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| National Environmental Management: Biodiversity Act (No 10 of 2004) and the Threatened or Protected Species Regulations (2007) | | Provides for the management and conservation of biodiversity, protection of species and ecosystems, and sustainable use of indigenous biological resources. |
| Relevance to the Proposed Project: | | |
| <ul style="list-style-type: none"> ▪ The proposed development must conserve endangered ecosystems and protect and promote biodiversity; ▪ Must assess the impacts of the proposed development on endangered ecosystems; ▪ No protected species may be removed or damaged without a permit; ▪ The proposed site and transmission routes must be cleared of alien and invasive vegetation using appropriate means. | | |

5.1.9 National Environmental Management: Protected Areas Act (31 of 2004)

| Legislation | Section | Relates to |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| National Environmental Management: Protected Areas Act (31 of 2004) | | Provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. Promotes sustainable utilisation of protected areas for the benefit of people, in a manner that would preserve the ecological character of such areas. |
| Relevance to the Proposed Project: | | |
| The gas pipeline connecting the FSRU to the Powerships will be routed along the edge of the existing eastern breakwater and will connect to the vessels via a flexible marine hose. This location is approximately 1.1 km away from the Jahleel Island. The breakwater will act as a natural buffer to operations occurring at the Port in relation to the island. | | |

5.1.10 National Environmental Management: Protected Areas Act (31 of 2004) - Strategy on Buffer Zones for National Parks (106 of 2012)

| Legislation | Section | Relates to |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| National Environmental Management: Protected Areas Act (31 of 2004) - Strategy on Buffer Zones for National Parks (106 of 2012) | | Defines buffer zones to protect important areas of high value for biodiversity and/or to society where these extend beyond the boundary of the Protected Area; and stipulate legal requirements for developments within formally established buffer zone. |
| Relevance to the Proposed Project: | | |
| The strategy states that all development in a formally established buffer zone that requires an environmental authorisation in terms of the NEMA, will be subject to an environmental impact assessment. | | |

The proposed project is situated within the Port of Ngqura, approximately 5 km from the Addo Elephant National Park Marine Protected Area and the sensitive marine and estuarine habitats therein.

5.1.11 National Heritage Resources Act (No 25 of 1999) and Regulations

| Legislation | Section | Relates to |
|-----------------------------------------------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| National Heritage Resources Act (No 25 of 1999) and regulations | Section 34 | No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority. |
| | Section 35 | No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site. |
| | Section 36 | No person may, without a permit issued by the South African Heritage Resource Agency (SAHRA) or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority. "Grave" is widely defined in the Act to include the contents, headstone or other marker of such a place, and any other structure on or associated with such place. |
| | Section 38 | This section provides for Heritage Impact Assessments (HIAs), which are not already covered under the ECA. Where they are covered under the ECA the provincial heritage resources authorities must be notified of a proposed project and must be consulted during the HIA process. The Heritage Impact Assessment (HIA) will be approved by the authorising body of the provincial directorate of environmental affairs, which is required to take the provincial heritage resources authorities' comments into account prior to making a decision on the HIA. |

Relevance to the Proposed Project:

- No person may alter or demolish any structure or part of a structure, which is older than 60 years or disturb any archaeological or paleontological site or grave older than 60 years without a permit issued by the relevant provincial heritage resources authority.
- No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter or deface archaeological or historically significant sites.
- Cultural and palaeontological impact assessments have been included as specialist studies in the EIA.

5.1.12 Conservation of Agricultural Resources Act (Act No 43 of 1983)

| Legislation | Section | Relates to |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------------|
| Conservation of Agricultural Resources Act (Act No 43 of 1983) | | Prohibition of the spreading of weeds |
| | | Control measures for alien and invasive plant species |
| Relevance to the Proposed Project: | | |
| There are no applicable permit or licence requirements, however cognisance of these requirements are to be taken during vegetation clearance and the maintenance of the existing servitudes, for the entire duration of the project lifecycle. | | |

5.1.13 National Ports Act (12 of 2005)

| Legislation | Section | Relates to |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| National Ports Act (12 of 2005) | | Provides for the establishment of the National Ports Authority and the Ports Regulator; the administration of certain ports by the National Ports Authority; and for matters connect therewith. |
| | | Prescribes that the National Ports Authority is to prepare and periodically update a Port Development Framework Plan (PDFP) for each port. The creation of new capacity in the ports' system results from the implementation of the Port Development Framework Plans. |
| Relevance to the Proposed Project: | | |
| TNPA is required by the Act to promote economic development of the Port. Further, a balance between environmental protection and economic development must be achieved. | | |

5.1.14 Occupational Health and Safety Act (No 85 of 1993)

| Legislation | Section | Relates to |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------|
| Occupational Health and Safety Act (No 85 of 1993) | Section 8 | General duties of employers to their employees |
| | Section 9 | General duties of employers and self-employed persons to persons other than their employees |
| Relevance to the Proposed Project: | | |
| The developer must be mindful of the principles and broad liability and implications contained in the OHSA and mitigate any potential impacts. Major Hazardous Installations are regulated under the Act. | | |

5.1.15 Infrastructure Development Act 23 of 2014

| Legislation | Section | Relates to |
|-------------|---------|------------|
|-------------|---------|------------|

| | | |
|-----------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Infrastructure Development Act 23 of 2014 | | <ul style="list-style-type: none"> • To provide for the facilitation and co-ordination of public infrastructure development which is of significant economic or social importance to the Republic; • to ensure that infrastructure development in the Republic is given priority in planning, approval and implementation; • to ensure that the development goals of the state are promoted through infrastructure development; • to improve the management of such infrastructure during all life-cycle phases, including planning, approval, implementation and operations; and • to provide for matters incidental thereto. |
| Relevance to the Proposed Project: | | |
| The designation of the Risk Mitigation IPP Procurement Programme as a Strategic Integrated Project. | | |

5.1.16 Hazardous Substances Act (No 15 of 1973) and regulations

| Legislation | Section | Relates to |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------------------------------------------------------------------------------------------------------------------------|
| Hazardous Substances Act (No 15 of 1973) and regulations | | Provides for the definition, classification, use, operation, modification, disposal or dumping of hazardous substances |
| Relevance to the Proposed Project: | | |
| <ul style="list-style-type: none"> ▪ Manage the hazardous substances in such a manner that it does not endanger human health or the environment. ▪ Prevent hazardous substances from being used for an unauthorised purpose. | | |

5.1.17 SANS 10103 (Noise Standard)

| Legislation | Section | Relates to |
|-------------------------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SANS 10103 (Noise Regulations) | | The measurement and rating of environmental noise with respect to annoyance and to speech communication, as well as the categories for community responses to excess environmental noise. |
| Relevance to the Proposed Project: | | |

The ambient noise level guidelines in SANS 10103:2008 is 70dBA during the day and 60dBA at night in industrial districts. These levels can be seen as the target levels for any noise emissions within the SEZ.

Furthermore, the South African noise control regulations describe a disturbing noise as any noise that exceeds the ambient noise by more than 7dB. This difference is usually measured at the complainant's location should a noise complaint arise. Therefore, if a new noise source is introduced into the environment, irrespective of the current noise levels, and the new source is louder than the existing ambient environmental noise by more than 7dB, the complainant will have a legitimate complaint.

Guidelines for expected community responses to excess environmental noise is reflected in Table 5-2 below.

Table 5-1: Categories of environmental community / group response (SANS 10103:2008).

| Excess Lr dB (A) | Estimated Community/Group Response | |
|------------------|------------------------------------|-------------------------------------|
| | Category | Description |
| 0 -10 | Little | Sporadic complaints |
| 5 - 15 | Medium | Widespread complaints |
| 10 - 20 | Strong | Threats of community / group action |
| > 15 | Very Strong | Vigorous community / group action |

5.1.18 National Road Traffic Act (No 93 of 1996)

| Legislation | Section | Relates to |
|---------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------|
| National Road Traffic Act (No 93 of 1996) | | Provides for controlling transport of dangerous goods, hazardous substances and general road safety |
| Relevance to the Proposed Project: | | |
| All the requirements stipulated in the NRTA will need to be complied with during the construction and operational phases of the proposed project; | | |

5.1.19 Gas Act 48 of 2001

| Legislation | Section | Relates to |
|--------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gas Act 48 of 2001 | | <p>This Act regulates the development and operation of gas transmission, storage, distribution, liquefaction and re-gasification facilities.</p> <p>No person may construct or operate gas storage facilities without a licence issued by the Gas Regulator (NERSA) except if listed in Schedule 1, in which case, registration may be required. Schedule 1 includes any person engaged in the transmission of gas for that person's exclusive use. Registration</p> |

| | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------|
| | | with NERSA is also required for the importation of gas. |
| Relevance to the Proposed Project: | | |
| As Karpowership will be importing, storing and regasifying natural gas and transporting it between its ships via a pipeline, it will need to comply with the provisions of this Act by applying for the necessary licence and/or registration. These application processes do not form part of the application process for environmental authorisation and an AEL. | | |

5.1.20 National Energy Regulator Act 40 of 2004

| Legislation | Section | Relates to |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| National Energy Regulator Act 40 of 2004 | | <p>This Act establishes a single regulator to regulate the electricity, piped-gas and petroleum pipeline industries. The statutory body is the National Energy Regulator of South Africa (NERSA).</p> <p>This Act requires NERSA inter alia to undertake the functions of the Gas Regulator as set out in section 4 of the Gas Act and the functions set out in section 4 of the Electricity Regulation Act, 2006, which includes the planning for new generation capacity and integrated resource plan.</p> |
| Relevance to the Proposed Project: | | |
| NERSA has been identified an organ of state having jurisdiction in respect of an aspect of the activities for which the EIA process is being conducted and thus has been registered as an I&AP as required by the EIA Regulations, 2014. | | |

5.1.21 Electricity Regulation Act 4 of 2006

| Legislation | Section | Relates to |
|--------------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electricity Regulation Act 4 of 2006 | | <p>The Act's main objective is to establish a national regulatory framework for the electricity supply industry and to make the National Energy Regulator of South Africa (NERSA) the custodian and enforcer of the national electricity regulatory framework.</p> <p>The Act empowers the Minister of Mineral Resources and Energy, in consultation with NERSA, to:</p> <ul style="list-style-type: none"> ▪ determine that new generation capacity is needed to ensure the continued uninterrupted supply of electricity; ▪ determine the types of energy sources from which electricity must be generated, and the percentages of electricity that must be generated from such sources; |

| | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | <ul style="list-style-type: none"> ▪ determine that electricity thus produced may only be sold to the persons or in the manner set out in such notice; ▪ determine that electricity thus produced must be purchased by the persons set out in such notice; ▪ require that new generation capacity must - <ul style="list-style-type: none"> ○ be established through a tendering procedure which is fair, equitable, transparent, competitive and cost-effective; ○ provide for private sector participation. <p>The Act also gives NERSA various powers to carry out its functions, including the power to consider applications for the licences required and issued under this Act. No person may operate any generation, transmission or distribution facility without a licence issued by NERSA.</p> |
| <p>Electricity Regulations on New Generation Capacity, 2006</p> | | <p>The objectives of the Regulations published under the Act are to:</p> <ul style="list-style-type: none"> ▪ to facilitate planning for the establishment of new generation capacity; ▪ the regulation of entry by a buyer and a seller into a power purchase agreement; ▪ to set minimum standards or requirements for power purchase agreements; ▪ the facilitation of the full recovery by the buyer of all costs efficiently incurred by it under or in connection with a power purchase agreement including a reasonable return based on the risks assumed by the buyer thereunder and to ensure transparency and cost reflectivity in the determination of electricity tariffs; and ▪ the provision of a framework for implementation of an IPP procurement programme and the relevant agreements to be concluded. |
| <p>Integrated Resource Plan (IRP) 2019</p> | | <p>The IRP 2019 was issued by the Minister of Mineral Resources and Energy under Notice No 1360 dated 18 October 2019 in Government Gazette 42784. The IRP is South Africa's national electricity infrastructure plan in which the country's energy mix is determined.</p> |
| <p>Relevance to the Proposed Project:</p> | | |
| <p>The primary enabling legislation for the Risk Mitigation IPP Procurement Programme is the Electricity Regulation Act, together with the Electricity Regulations on New Generation Capacity and the IRP 2019. Karpowership's proposal for New Generation Capacity through its Powership projects falls under the Risk Mitigation IPP Procurement Programme.</p> | | |

In order to generate and transmit electricity, Karpowership will require a generation licence from NERSA. This application is separate to the application process for environmental authorisation and an AEL.

Table 5-2: Applicable Provincial Plans, Strategies and Programmes

| Legislation | Relates to |
|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Eastern Cape Vision 2030 – Provincial Development Plan (2014) | Outlines goals, visions, key objectives and strategic actions related to equitable economy, education, empowerment and health for rural and economic developments, including the protection of environment assets and natural resources. |
| Eastern Cape Biodiversity Conservation Plan | Informs protected area expansion and biodiversity stewardship programmes in the province, indicating areas with conservation needs, including critical biodiversity areas. |
| Eastern Cape Coastal Management Programme | The Eastern Cape Coastal Management Programme, dated 2013, was developed to meet provincial obligations as stipulated in the ICM Act. The provincial programme (hereafter the Eastern Cape PCMP) situates the importance of integrated coastal management in promoting and achieving sustainable coastal development in the Eastern Cape |
| Eastern Cape Climate Response Strategy | The Eastern Cape Climate Change Response Strategy is the only pertinent provincial climate change document in respect of the proposed project. Similar to the Western Cape Climate Response Strategy, this strategy does not act as a regulatory document. Instead the strategy acts as a high-level policy document that provides some guidelines for developing appropriate adaptation and mitigation responses and contextualises these guidelines within: i) the context of projected climate change impacts in the Eastern Cape; and ii) the development priorities within the Eastern Cape. |
| Eastern Cape Biodiversity Conservation Plan (ECBCP) | The Eastern Cape Biodiversity Conservation Plan identifies areas within the Eastern Cape that require conservation, and supplies land use guidelines for the province based on conservation values (Berliner et al 2007). This spatial biodiversity conservation plan looks at the province and defines areas of conservation value based on large numbers of threatened species, large numbers of species or ecosystems or ecological processes that are crucial for the long-term persistence of biodiversity. |
| Subtropical Thicket Ecosystem Programme (STEP) | <p>The Subtropical Thicket Ecosystem Programme or STEP is a bioregional programme for the area where thicket is the dominant vegetation type, predominantly in the Eastern Cape (Pierce & Mader 2006). The function of STEP is to promote the sustainable management of the biodiversity of the region, as much of it is under pressure from poorly planned development.</p> <p>STEP can be used to identify areas that are crucial to conservation and areas that can withstand some development. It provides land use</p> |

| | |
|--|----------------------------------------------------------------------------------------------------------------------------------------------|
| | guidelines for each conservation status as well as for other natural areas and for corridor, to prevent fragmentation (Pierce & Mader 2006). |
|--|----------------------------------------------------------------------------------------------------------------------------------------------|

Table 5-3: Applicable– Regional and Local Planning Frameworks

| Legislation | Relates to |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nelson Mandela Bay Municipal (NMBM) Integrated Waste Management Plan (2016 – 2020) | Defines the vision, objectives and targets for the provision of solid waste management services, including all aspects of waste management from waste generation to waste reduction, recycling, treatment and disposal in order to reduce waste to landfill. |
| NMBM IDP (2017/18 – 2021/22) | Serves as a strategic action and informs and guides all relevant planning, management, budgeting and decision making processes within the institution. |
| NMBM SDF (2015) | Includes power production, inclusive of investments in the energy sector, with the purpose of feeding into the electrical grid, with the focus on renewable energy, peaking power generation capacity, and other key areas within the energy cluster. |
| Nelson Mandela Bay Coastal Management Programme | The Nelson Mandela Bay Municipality (NMBM) Municipal CMP, updated in 2015, is proposed as an implementation-based program focussing on three broad priority areas, namely: natural resource management; coastal pollution and coastal development, with the latter including broad coastal management objectives, management recommendations and implementation strategies. The NMBM coastal zone is divided into 20 segments with the Port of Ngqura included in segment 2. Coastal development is assessed strategically according to management areas, however the Coega IDZ and Port of Ngqura are excluded as the NMBM does not undertake maintenance activities within these areas (CEN, 2015). |
| Coega Open Space Management Plan (2014) and Coega IDZ Development Framework (2006) | Provides an overall development strategy for the Coega IDZ, including environmentally sensitive planning approach for linear infrastructure. |

5.2 INTERNATIONAL AGREEMENTS

South Africa is a party to a number of international agreements which regulate shipping as well as the protection of marine resources:

- International Convention for the Prevention of Pollution from Ships - MARPOL 73/78
 - The MARPOL Convention regulates pollution from ships – accidental pollution and pollution from the general operations associated with shipping; Preserves the marine environment by eliminating pollution from harmful substances. Ships sailing under the flag of a country that

has entered into the MARPOL convention are expected to comply with the regulations. The MARPOL Convention was ratified by South Africa in 1985,

- Convention on Biological Diversity - 1992-1995
- International Convention on Civil Liability for Oil Pollution Damage - 1969-1997
- International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties - 1969-1986
- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention) - 1972-1978
- Protocol to the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter - 1996-1998
- United Nations Convention on the Law of the Sea (UNCLOS) - 1982-1997
- Protocol relating to intervention on the high seas in cases of pollution by substances other than oil - 1973-1997
- International Convention for the Safety of Life at Sea - 1974-1980
- [Convention on the Conservation of Migratory Species of Wild Animals](#)
- [Agreement on the Conservation of African-Eurasian Migratory Waterbirds, or African-Eurasian Waterbird Agreement \(AEWA\)](#)

Also of relevance to the Project is the Framework Convention on Climate Change, 1992 and the Paris Agreement. This is discussed in more detail under Section 6.

6 MOTIVATION, NEED AND DESIRABILITY

2014 EIA Regulations (as amended), Appendix 2 – 2(1) a scoping report must include (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 location

6.1 MOTIVATION FOR THE NEED AND DESIRABILITY FOR THE PROPOSED DEVELOPMENT

This section contextualises the strategic planning context within which the Project is being proposed.

South African legislation, including the Constitution and NEMA, entrenches the principle of sustainable development as do the various National strategies, policies, programmes and plans, including the National Development Plan 2030 (NDP). The motivation for the need and desirability motivation for the proposed Project thus needs to be assessed within the context of these strategies, policies, programmes and plans by specifically looking at whether the proposed project is ecologically sustainable and socially and economically justifiable.

STRATEGIC OVERVIEW

The United Nations Sustainable Development Goals (SDGs) or Global Goals were adopted by all member states of the United Nations in 2015 in the commitment to end poverty, protect the planet and ensure peace and prosperity for all people by 2030. South Africa was one of these nations.

The provision of electricity falls under the SDG 7: Affordable and Clean Energy. Notably, the goals are integrated and an improvement in one area affects the outcome of the other SDG areas. For example, an improvement in SDG 7: Affordable and Clean Energy is likely to lead to an improvement in the other SDGs such as: 1 (No Poverty); 3 (Good Health and Well-Being); 8 (Decent Work and Economic Growth); 9 (Industry, Innovation and Infrastructure); 11 (Sustainable Cities and Communities) and 13 (Climate Action).



Figure 6-1: United Nations Sustainable Development Goals (Source: UN General Assembly, 21 October 2015)

Environmental

The principles outlined in the National Environmental Management Act 107 of 1998 (NEMA) must be applied to all decision-making that may affect the environment and its biodiversity. The first two principles in Section 2 of NEMA are that, “environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably” and “development must be socially, environmentally and economically sustainable”.

Given the integrative nature of sustainability, the requirement for and provision of reliable energy will cross cut various environmental, social and economic goals. Various specialist environmental studies are being commissioned to identify the potential environmental impacts of the proposed project on life below water, life on land and climate change in order to establish required mitigation in terms of alternatives and other mitigation measures during the EIA phase. Preliminary findings indicate that:

- GHG emissions, due to the use of natural gas rather than LPG as energy source, are likely to be very low;
- Marine environment impacts such as physical disturbance of the littoral zone, increased seawater temperatures and modifications to the hosted biological communities may occur. However, gas pipeline design and construction as well as mitigations for e.g. temperature increases as per maritime engineering may be effected within coastal temperature discharge standards thereby reducing impacts;
- Risk management can be applied to limit air quality or maritime related incidents;
- Life on land impacts e.g. vegetation clearance, aquatic and wetlands are within the limits of acceptable change as the relatively short distance (less than 10km) 132KV transmission line is the only aspect of the project to have a terrestrial impact. The Karpowership with its relatively small footprint will be moored in the port and have no significant footprint typically associated with power stations or solar power plants.

- Abstraction for cooling purposes will be from the coastal waters with an abundant supply being available in the Port. Fresh water resource allocation, protection of the reserve as well as concerns related to water scarcity, usually associated with land-based power stations, will therefore not be a concern.
- Waste management impacts to the marine environment from black and grey water can be avoided in accordance with the MARPOL requirements.

The concept of generating power on the ocean has several benefits over land-based power plants, including small footprint (e.g. the same amount of output can be achieved in a much smaller area compared to land based power plants), significantly shorter timeframes for project delivery / adding capacity, as the Powerships arrive already assembled and ready-to-operate, and land-based impacts are limited and of short term, associated with the establishment of the transmission line and the temporary assembly area for the gas pipeline.

More detail of each of these environmental factors is provided elsewhere in the draft Scoping Report, namely the project scope alternatives (Section 3), baseline environment section (Section 4) as well as preliminary risk assessment (Section 8).

These impacts also need to be considered together with the socio-economic-context i.e. the need to improve the economy and job creation, sustaining businesses and industry within a constrained energy sector and ensuring energy provision for a growing population where many is still disadvantaged and have to making a living without energy. The proposed project is likely to have a significant socio-economically benefit locally, provincially and nationally based on the proposed capacity to be generated and supplied to the grid network, as expanded in the following sections.

The environmental as well as socio-economic impacts will be assessed in more detail in the EIA phase.

Socio-economic

The importance of energy for socio-economic benefit is well documented as early as 2012- The Draft 2012 Integrated Energy Planning Report: Executive Summary (IEPR) stated that “energy access is now widely recognised as a prerequisite for human development”. The access to electricity is outlined within the Municipal Services Act 32 of 2000, giving priority to the provision of basic needs to the local community that is “conducive to the prudent, economic, efficient and effective use of available resources”. NEMA supports this through the principle of “equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination”, as would be the case for facilities and citizens unable to afford the more expensive countermeasures to stable electricity supply throughout load shedding.

According to the National Development Plan (NDP) (2030), Government is committed to ensure economic growth and development through adequate provision of sustained energy services that are competitively priced, reliable and efficient. This must be ensured to promote sustainable development and to ensure that the living standard of South African citizens is maintained and improved.

South Africa has experienced a progressively worsening energy crisis from 2007 that has resulted in numerous load shedding events including Level 6 load shedding. Eskom, which provides over 90% of power generating capacity in South Africa (Donnelly, 2018; Mthethwa, 2019; Gosling, 2019; Cohen & Vecchiato, 2019), has been

unable to meet the demands of both the private and public sector. The load shedding measures which were implemented to prevent a total blackout has had dire effects on the South African Economy according to Goldberg, 2015 and Makinana, 2019. Load shedding reduced the South African GDP by roughly 0.30% in 2019, which translates to 8.5 billion of real, inflation-adjusted Rand (Writer, 2019).

Government interventions of introducing additional power stations, generators and even tariff increases have proved to be inefficient in terms of addressing the country's electricity shortages. The Integrated Resource Plan (IRP) 2019 stressed a short-term gap in supply to be anticipated between 2019 and 2022 due to the time expected for the new power stations (Medupi and Kusile) and the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) to come online. This may further be delayed by the poor design and planning of the Medupi and Kusile plants and the delayed correction thereof (Hosken, 2020). The IRP specified the need for new energy efficient technology and the diversification of both the supply and nature of energy production to reduce pollution and minimise impacts related to climate change.

The CSIR (*Setting up for the 2020s: Addressing South Africa's electricity crisis and getting ready for the next decade, 2020*) further predicts that load shedding can be expected for the next 2 – 3 years and that an urgent response is required to ensure reliable short-term energy supply.

Criteria to decide on options to meet the short-term gap should be informed and applied consistently to ensure reasonable cost and timeous delivery

Criteria for choice of short-term options available can ensure a portfolio of options:

- 1 Can be supply-side, demand-side and/or storage
- 2 Can be delivered in 1-2 years
- 3 Will not require extensive procurement process (lead-time)
- 4 Can meet capacity (MW) and/or energy needs (MWh)
- 5 Can be contracted for 1-3 years (or more if aligned with long-term energy mix)
- 6 Ease of implementation (does not require extensive regulatory reform/change)
- 7 Aligned with long-term energy mix pathways (technology choices)
- 8 Does not require extensive network expansion or augmentation for interconnection

Figure 6-2: Extract from the CSIR Report (*Setting up for the 2020s: Addressing South Africa's electricity crisis and getting ready for the next decade, 2020*)

The Minister of Mineral Resources and Energy published regulations to help address South Africa's ongoing power issues (Staff Writer, 2020 (b)). In addition, the National Development Plan (2030) outlined the need to move the electricity system from Eskom to an independent system and for accelerated procurement of independent power producers on a wide range of alternatives, moving away from the unsustainable use of coal as fuel resource.

The proposed Project, is aligned with National Government initiatives e.g. the "RFI Response Risk Mitigation Power Procurement Programme" and Request for Proposal (RFP) which aims to alleviate the immediate and future

capacity deficit as well as the limited, unreliable and poorly diversified provision of power generating technology with its adverse environmental and economic impacts. The RFP stipulated stringent environmental, social and economic criteria inclusive of e.g.:

- the shift from coal and LPG to NG as a cleaner and more cost effective resource;
- BBBEE criteria;
- Skills development.

Karpowership, in submitting applications in terms of the IPP initiatives will comply with sustainable development criteria as these applications are compiled with input from various Government Departments that need to ensure compliance with the Constitution and NEMA principles and meet the country's international obligations.

According to the applicant, projects will meet and exceed Economic Development qualification criteria stipulated within the RMIPPPP RFP. Karpowership will engage with local businesses and award contracts to local service providers for maintenance aspects as well as waste management, food and other daily consumables. They take pride in their positive impact on local communities through both social responsibility programs, tailored to the specific needs of the community, and the career opportunities that are provided.

Karpowership projects create significant direct and indirect employment, driving knowledge and skills transfer across a broad spectrum of disciplines including some that are unique to floating power plants. Karpowership also emphasizes youth development as the future of our business, industry, and the local economy. As a globally recognized leader with 1,800+ direct employees, they provide an opportunity for South Africans, which will make up the majority of their personnel, to develop specific skills and knowhow which will ultimately benefit the South African economy. They will also be provided with the opportunity to become part of an internationally diverse team, gaining and sharing experience and knowledge either locally or worldwide alongside industry leading colleagues.

There will be a significant number of local employees for both the construction and operation period which will exceed the Economic Development criteria that must be reached under the terms of the RMIPPPP. They also believe that the job creation, including within the power generation function, will be comparatively more than a renewable energy project should the project be selected to proceed. Detailed job creation and other local economic development activities will be provided at preferred bidder stage during EIA preparation.

NEW GENERATION CAPACITY AND RISK MITIGATION IPP PROCUREMENT PROGRAMME

The Department of Mineral Resources and Energy (DMRE) issued the Request for Proposals (RFP) to procure new energy generation capacity as per Government Notice 753 (7 July 2020): Determination Under Section 34(1) of the Electricity Regulation Act, 2006 (Act No. 4 of 2006) wherein the Minister, in consultation with the National Energy Regulator of South Africa (NERSA) has determined "that new generation capacity is needed to be procured to contribute towards energy security" and "the electricity must be purchased from independent power producers".

The Risk Mitigation Independent Power Producer (IPP) Procurement Programme has been identified by the DMRE as the appropriate programme to procure the new generation capacity designated in the above Determination. As such, a call for proposals to IPPs was published by DMRE "to ensure the establishment of this new generation capacity through the Risk Mitigation IPP Procurement Programme:

- The Risk Mitigation IPP Procurement Programme has been designed to procure the target of 2000 MWs of new generation capacity to be derived from different types of dispatchable power generation projects

that will enter into public-private agreements with Eskom to provide new generation capacity in compliance with the Performance Requirements, among other things.

- The dispatchable power generation projects may utilise fuel to produce the energy output and may be comprised of more than one facility and project Site.
- Furthermore, the selected projects will contribute towards socio-economic development and sustainable economic growth, while enabling and stimulating the participation of independent power producers in the electricity supply industry in South Africa.”

The updated Integrated Resource Plan (IRP) 2019 was developed as a “co-ordinated schedule for generation expansion and demand-side intervention programmes, taking into consideration multiple criteria to meet electricity demand”. The IRP is a plan for infrastructure development based on a least supply and demand balance approach, taking into account security of supply and minimising negative emissions and water usage impacts on the environment. It has been developed within a context characterised by changes in energy technologies and their associated uncertainty of the impact on the future energy provision system. With this uncertainty expected to continue, a cautionary approach must be adopted when making assumptions and committing for the future in this rapidly changing environment. As such, long-term commitments are to be avoided as much as possible, to eliminate the risk that they might prove costly and ill-advised (IRP, 2019).

The decommissioning of the existing coal fleet (due to end of design life) can provide space for a relatively different energy mix. It must be noted that, in the period preceding 2030, the system requirements are largely for incremental capacity addition (modular) and flexible technology, to complement the existing installed inflexible capacity (IRP, 2019). This is essentially what a system like the Karpowership fleet can provide, ship-based power generating and transmission of energy to land-based transmission connection points. This capacity can be modularly up-scaled on site with a very short lead time to meet additional requirements, should these be required at a later stage.

Also of particular importance is securing energy security by developing adequate electricity generation capacity to meet our demand under both the low-growth economic environment as well once the economy improves to the level of 4% growth per annum. Electricity generation capacity must therefore be paced to restore the necessary reserve margin and to be ahead of the economic growth curve at least possible cost (IRP, 2019).

One concern and risk raised during the August 2018 public participation process undertaken for the IRP 2019 update, was related to the capacity provided for and practicality of gas to power and the risks it poses since South Africa does not currently have adequate gas infrastructure. The Karpowership generation process proposes the use of internationally sourced LNG gas supply that will be transported via a LNG carrier to the proposed FSRU location. A gas line will be established between the FSRU and Powerships to provide a secured supply of natural gas. No gas supply is required from local South Africa resources to ensure efficient operations and all other infrastructure will be supplied.

ESKOM POWER RELIABILITY AND GOVERNMENT’S RESPONSE TO THE ENERGY DEMAND

Past experiences show that Eskom has not always been able to meet the electrical demands of the country.

Eskom’s existing generation plant Energy Availability Factor (EAF) was assumed to be averaging 86% in the promulgated IRP 2010–2030. The actual EAF at the time (2010) was averaging 85%. Since then, Eskom’s EAF declined steadily to a low average of 71% in the 2015/16 financial year before recovering to average around 77%

in the 2016/17 financial year. Information as at January 2018 indicated that EAF had regressed further to levels below 70%. This low EAF was the reason for constrained capacity early in December 2018 and January 2019 that resulted in load shedding (IRP, 2019).

Additionally, the IRP (2019) states that there are a number of Eskom coal plants that will reach end of design life from year 2019 and that most of the Eskom plants were designed and constructed for operation for 50 years. Eskom had also submitted a revised plant end of design life (decommissioning) plan. This submission brings forward the shutdown of some units at Grootvlei, Komati and Hendrina. The IRP (2019) showed that approximately 5 400 MW of electricity from coal generation by Eskom will be decommissioned by year 2022, increasing to 10 500 MW by 2030 and 35 000 MW by 2050. The socio economic impact of the decommissioning of these Eskom plants were not quantified or included in the IRP.

A number of Eskom power plants (Majuba, Tutuka, Duvha, Matla, Kriel and Grootvlei) have been retrofitted with emission abatement technology to ensure compliance with the law (IRP, 2019). In 2014 Eskom applied for postponement of the date for compliance and permission in this regard was granted for a period not exceeding 5 years. According to the IRP (2019), Grootvlei was the only station that has been brought to compliance and failure to undertake abatement retrofits is likely to result in non-compliant plants. Eskom has been known to apply to postpone compliance with the minimum emissions standards for air pollution. With multiple additional postponement application for the majority of their powerstations during 2020. Eskom has stated that it will apply for rolling postponement rather than trying to meet the sulphur dioxide standards. Should these not be issued, Eskom maybe required to expedite plans to decommission old polluting stations that cannot meet the MES with potential dire consequences for secured energy supply.

Simulations used to update the IRP (2019) show that there is an immediate risk of energy shortage in the immediate term. Eskom's early shutdown of non-performing units (Grootvlei, Komati and Hendrina), coupled with the non-compliance status of some plants and the de-rating of Medupi and Kusile to below name-plate rating result in an immediate risk of huge power shortages. The recently experienced load shedding as well frequent alerts of possible shortages corroborate the observations from the power system simulations.

Industrialisation of South Africa has led to increased demand for electricity by an ever-growing population from a strained power service operated by, Eskom. This has led to a number of power shortfalls throughout the country, as supply cannot meet demand. The power shortfalls and the unreliable electricity generation has had major impact on the South African economy (Goldberg, 2015; Makinana, 2019). Furthermore, certain temporary and permanent shut downs of power plants across the country have come with serious impacts to energy supply. These shutdowns directly impact the energy supply to the host community thus directly impact the local economy. This has generated the need for a diversified/ innovative power supply. This is based on national policy and informed by ongoing planning undertaken by the Department of Energy (DoE) and the National Energy Regulator of South Africa.

The National Development Plan 2030 has outlined access to electricity as one of the "Elements of a Decent Standard of Living". South Africa has faced significant electricity shortages over a number of years and the escalating electricity crises experienced since 2007 has significantly impacted the standard of living of its citizens and resulted in ruinous economic losses.

In order to achieve sustainable and inclusive growth by 2030, South Africa needs to invest in a strong network of economic infrastructure to support the country's medium and long term objectives according to the National Development Plan (NDP) 2030.

The vision of the NDP includes the promotion of economic growth and development through adequate provision of quality energy services that are competitively priced, reliable and efficient. Addressing access to energy will promote sustainable development, encourage economic competition and ensure that living standards are maintained and improved. According to the Integrated Resource Plan 2019, the Minister of Energy determined that 39,730 MW of new generation capacity must be developed. Currently 18,000 MW of the required 39,730 MW has been committed to as follows:

- 6,422 MW new capacity under the REIPPP with a total of 3,876 MW operational on the grid;
- 4,514 MW Eskom build with remaining planned build of 6,418 MW;
- 100 MW of Sere Wind Farm; and
- 1,005 MW from OCGT for peaking.

A key component of the 20 year master-plan is the requirement for new energy generating capacity from a range of technologies like renewables and natural gas. Alternative sources of power generation allow countries to move away from open cycle gas turbines (OCGTs) (South Africa's- Eskom situation), and use of expensive diesel to generate electricity during peak demand (Siyobi, 2015).

The use of natural gas from LNG in power generation provides a cleaner alternative to coal and other fossil fuels, reducing carbon and other emissions such as SO₂ and PM₁₀, resulting in both immediate and long-term benefits for public health and the environment. LNG shipments allow the environmental benefits of natural gas to be spread around the world and can help reduce global greenhouse gas emissions according to a report by PACE Global LNG and Coal Life Cycle Assessment of Greenhouse Gas Emissions. The ability to burn natural gas for power generation is an ideal complement to renewable energy generation, like wind and solar power, which can be intermittent and inconsistent in their output. Natural gas power plants can be quickly turned on and off or ramped up and down to help provide consistent electricity production when solar or wind resources fluctuate.

As part of his 2020 State of the Nation Address on 13 February 2020, the President announced that government would implement measures to "rapidly and significantly increase generation capacity outside of Eskom". Established measures include the Section 34 Ministerial Determination that supports the Integrated Resource Plan 2019, which facilitates additional energy generation to the national grid through renewable energy, natural gas, hydro power, battery storage and coal.

The Emergency/Risk Mitigation Power Purchase Procurement Program (2000 MW) (ERMPPPP) has been declared a Strategic Integrated Project (SIP) under the Infrastructure Development Act, 2014 under SIP 20. One of the objects of this Act is "the identification and implementation of strategic integrated projects which are of significant economic or social importance to the Republic or a region in the Republic or which facilitate regional economic integration on the African continent, thereby giving effect to the national infrastructure plan".

South Africa's electricity generation capacity shortfall can only be solved by additional generating capacity. Although additional power stations are under construction, there is a lengthy gap of time between the present shortage and the commissioning of all units of these new power stations. In the meantime, the economy suffers from the reduction

of productivity and increased costs resulting from power interruptions caused by equipment failure (so-called unplanned maintenance) and load shedding.

Access to cost-effective temporary base-load generation of a significant magnitude will help to solve the problem by supplying the power to meet the load which is often being shed or reduced at present. Reliable power generation facilities are required to address both the immediate power shortfalls, as well as the longer term increasing demand for electricity. Powerships can deliver electricity in a very short timeframes as the normal delays associated with land-based power plants construction are negated as these powerships have been purpose built prior to deployment.

ECONOMIC RECOVERY AND ENERGY REQUIREMENTS

Sustainable energy provision is also key to ensuring economic recovery. The CSIR reported that in 2019 load shedding reduced the South African economy by between R 60 billion to R 120 billion (Wright and Callitz, 2020). There are estimations that the overall economic loss to the South African economy over the last 10 years is as high as R 338 billion. Energy analysts have determined that every hour of every stage of load shedding costs the economy R 50 million to R 100 million (Hosken, 2020). Energy analysts predict that load-shedding will have a greater detrimental impact to South Africa's failing economy and may drive many businesses into bankruptcy and reduce investment into the country (Hosken, 2020).

IMPORTANCE OF NATIONAL & PROVINCIAL COLLABORATION AND PRIVATE PARTNERSHIPS

As per the MEC of Economic, Development, Tourism and Environmental Affairs (EDTEA) (25 May 2020), the department supports the Port of Ngqura Bay to stimulate sectors and ultimately grow the provincial economy. RBIDZ is working with the private sector and forming partnerships with neighbouring provinces and other countries. According to the MEC such partnerships are crucial because the growth of KZN is also dependent on the growth of other provinces and various other states and trading friends of South Africa. The planned economic recovery for the Country will be impossible in the absence of a reliable and adequate power supply to the economic sectors. Therefore, the success of one province impacts on the success of other provinces. The establishment of reliable power has in one province therefore has a domino effect on the economic sectors of other provinces.

PORT PLANNING

Transnet have been actively involved over an extended period of time with the identification of gas to energy options to be established within the Ports e.g. "Transnet preparations for gas infrastructure in South Africa" as part of the South Africa Gas Options Conference held on September 2015 in Cape Town.

The Port of Ngqura is moving towards becoming the primary central port, while the Port of Port Elizabeth is transitioning to providing complementary services to the Port of Ngqura (National Port Plan, 2019). The 2010 gazetted port limits are presented in Figure 6-3 and the layout of the port, indicating the precincts and berth layout, is presented in Figure 6-4.



Figure 6-3: Ngqura gazetted port limits (Government Gazette No. 32873 –January 2010)



Figure 6-4: Precincts and berth layout of the Port of Ngqura

Due to the Port's strategic placement, it is able to economically contribute to the Nelson Mandela Bay Metro Municipality GDP (31 %) which is regarded as a significant weight in the manufacturing sector (National Port Plan, 2019). The strategy of the Port of Ngqura is also strongly aligned with the SEZ taking into account the ecology of the area as well as addressing the socio-economic issues in Eastern Cape Province.

The future planning of the port is steering towards a multi-purpose terminal. The Port is also making provision for Liquid Natural Gas (LNG), which further establishes the Port as an energy hub (National Port Plan, 2019). Leading technological innovation is evident in the implementation of an Integrated Port Monitoring System (IMPS) and Automated Mooring System (AMS) that aim to enhance productivity, safety, and efficiency within the port (National Port Plan, 2019).

Short Term Layout Plan

The planned port layout for the year 2019 to 2028 is shown in Figure 6-5.

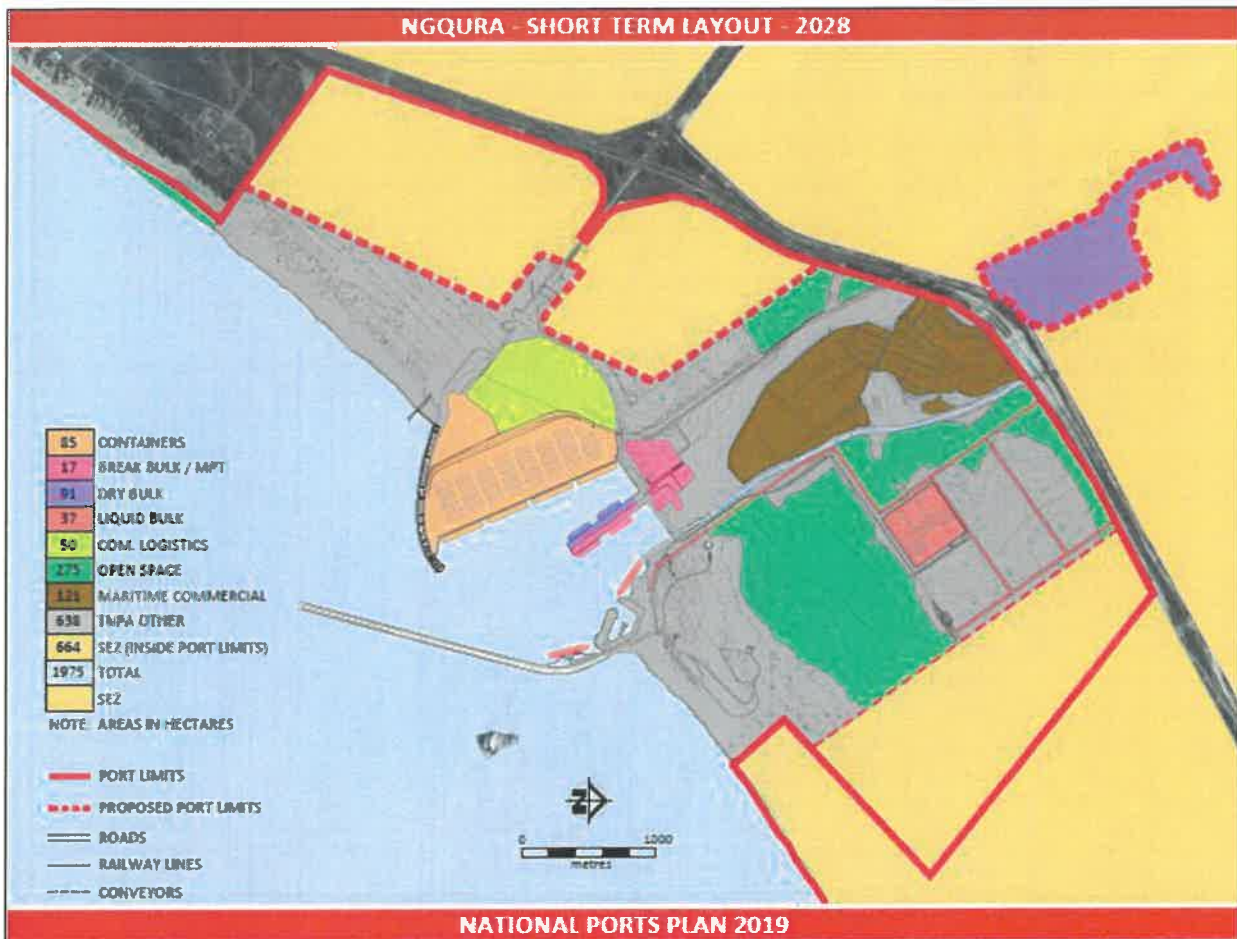


Figure 6-5: Port of Ngqura short-term layout

The following changes are foreseen for the short-term layout:

- Break bulk berth B100 converts to liquid bulk.
- Break bulk berths C100 and C101 convert to dry bulk.
- A portion of the TNPA other land (37 ha) being reassigned to liquid bulk.
- Proposed port limits to change to accommodate the manganese stockyard (additional 88 ha storage for dry bulk).
- Boundary line changes to proposed port limits.
- TNPA “other” land (36 ha) being reassigned to commercial logistics (Port Logistic Park).
- Liquid bulk terminal at the finger-jetty to be converted back to break bulk.
- Liquid bulk move to a new berth, A100.
- A new LNG berth to be constructed next to the eastern breakwater.
- Construction of a new break bulk berth B101.
- Dig out next to the finger-jetty provides additional quay lengths for two additional berths

Medium-term layout

Illustrated in Figure 6-6 is the planned port layout for the year 2024 to 2046.

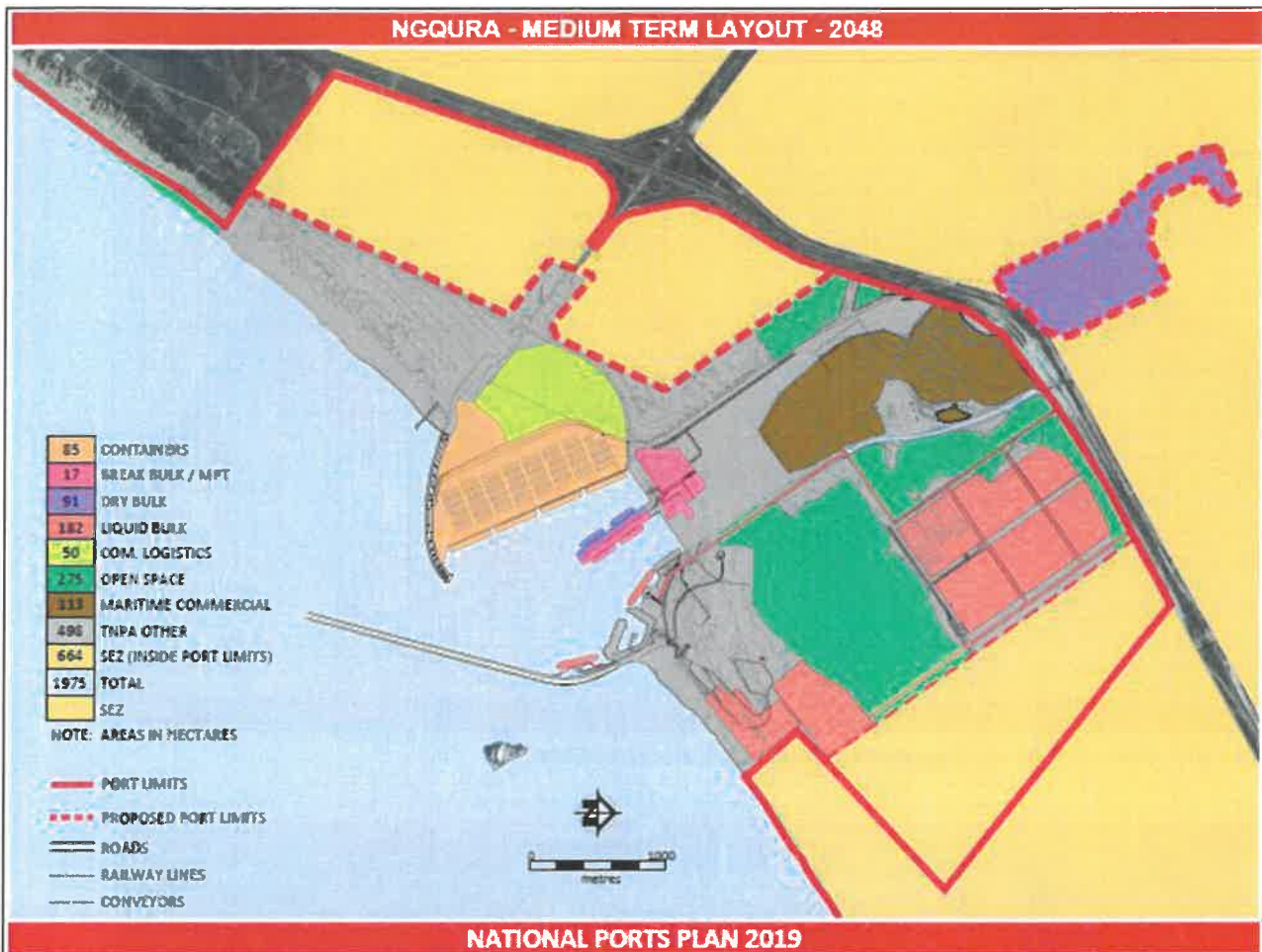


Figure 6-6: Port of Ngqura medium-term layout

The following changes are predicted from the short-term to the medium-term port layout:

- TNPA other available land (145 ha) to be converted to liquid bulk and LNG storage facilities.

Long-term layout

Figure 6-7 and Figure 6-8 show the planned port layout for the years beyond 2048 for the Port of Ngqura.

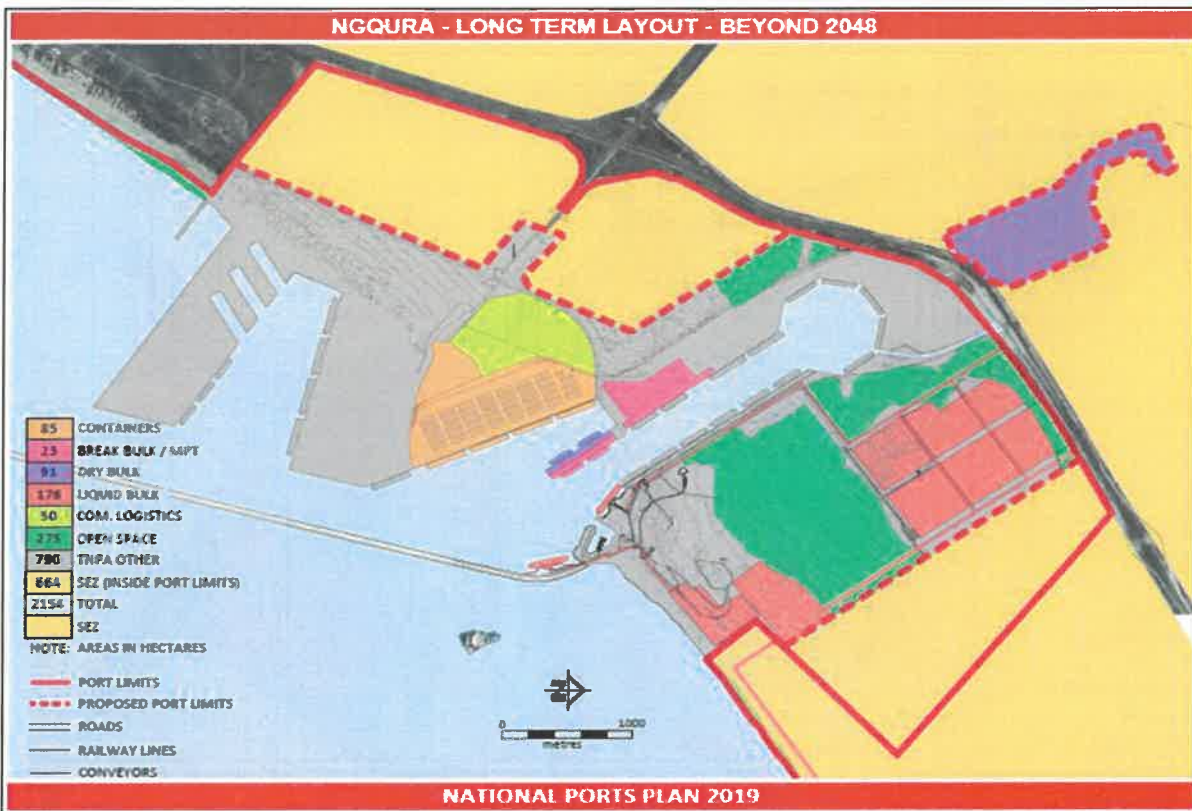


Figure 6-7: Port of Ngqura long-term layout (excl. the new SPM)

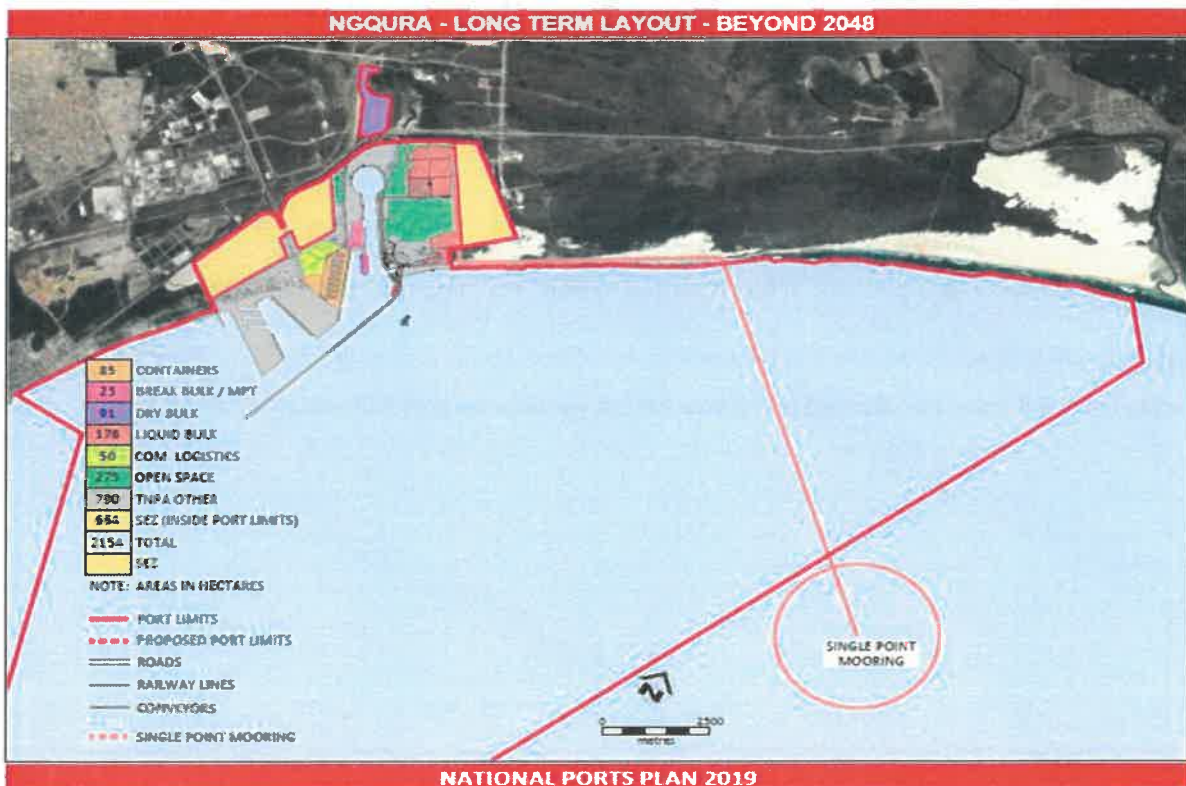


Figure 6-8: Port of Ngqura long-term layout (incl. the new SPM)

The following additional developments are envisioned for the long-term layout:

- Extension of the eastern breakwater
- Port expansion towards the north. Dig-out provides capacity for additional 14 berths.
- Port expansion to the west. Dig-out provides capacity for additional 8 berths. This expansion includes land reclamation to provide additional quay lengths. TNPA other land area increased by 190 ha.
- New Single Point Mooring (SPM) to be constructed.

The above three layouts (short, medium and long-term) align with the Eastern Cape Vision 2030 Provincial Development Plan, Eastern Cape Strategic Plan 2020 – 2025 and the Nelson Mandela Bay Municipality Draft Integrated Development Plan – 2017/18 – 2021/22 which support the expansion of the Port.

The project proposal, having been assessed by PRDW in relation to the proposed Port Plans, is considered to be aligned with the Transnet studies and plans.

As per the National Port Plan (2019), the Port of Ngqura has been earmarked for further development in the port expansion plans, and the proposed development site is situated within the planned expansion area.

MUNICIPAL PLANNING

Furthermore, in line with the planned expansions on the Port (as per the National Ports Plan, 2019), the port expansion is also captured in the Nelson Mandela Bay Metro Municipality: IDP (2017/18-2021/22) and the Metropolitan Spatial Development Framework (dated 2009).

The study area falls within a critical biodiversity area (CBA1 or CBA 2), listed as irreplaceable, which encompasses all areas that are currently in a natural or near natural state. However, there are several conservation planning tools that help with guiding proposed developments within the area as well as assessing their ecological sensitivity, each of these was considered and assessed. For example the Coega Open Space Management Plan provides guidelines for development within the Port of Ngqura as well as within the Coega Industrial Development Zone. Whilst the sensitivity and significance of estuarine areas are recognised, the estuary itself has seen extensive modifications and ecological degradation from its natural condition due to its historical conversion into a commercial saltworks, and consequently very little natural estuarine habitat remains therefore restoration will not be considered.

The proposed development of infrastructure for the provision of electricity is in line with the permitted uses within the Harbour land use. The ports of South Africa are hubs of the economy, maintaining crucial connection between sea and land transport as well as imports and exports. Ports are closely associated with the IDZs/ Special Economic Zones (SEZ) in terms of the Special Economic Zones Act 16 of 2014, so called as they are specifically designed to allow for related industries to be based in an Industrial Zone.

COEGA SEZ

The Coega Industrial Development Zone which was established in 1999 at the Nelson Mandela Bay Metropolitan Municipality (NMBM) in the Eastern Cape Province. It was designated as a Special Economic Zone (Coega SEZ) in terms of the Special Economic Zones Act 16 of 2014. The Coega IDZ, managed by the Coega Development

Corporation (CDC) is adjacent to the deep water Port of Ngqura SEZ which was developed and is managed by the Transnet National Ports Authority (TNPA)

The Coega SEZ created opportunities through clusters that facilitate synergy and supply chain integration. Zone 8 Port Area and Zone 13 – Energy Cluster enable the location of the proposed project as per the lay-out and provisions of the Energy Cluster. It is anticipated that the proposed project can be accommodated within the Coega IDZ, Energy Cluster layout below.

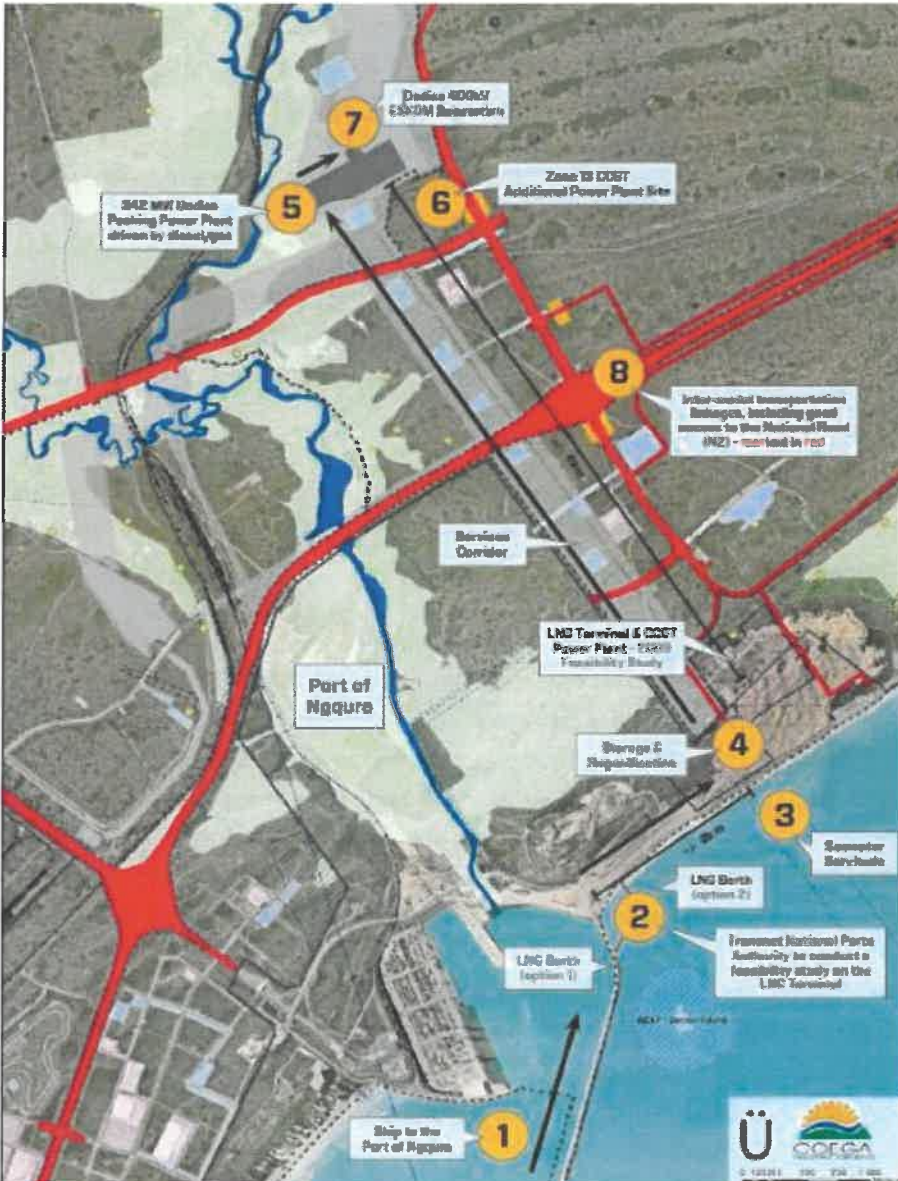


Figure 6-9: Port of Ngqura long-term layout (incl. the new SPM)

Karpowership SA (Pty) Ltd proposes to establish powerships within the port of Ngqura, feeding energy into the South African national electricity grid. This is in line with the following plans developed for future planning of the area. As per the Eastern Cape Vision 2030 Provincial Development Plan, the 2030 Provincial Development Plan

(PDP) outlines the vision for the Eastern Cape province. The main focus is economic transformation and job creation, education, skills and health, reliable and quality basic services, spatial integration, human settlements and local government, safe communities, a capable as well as an ethical and developmental state. These priorities form the framework for Eastern Cape Socio Economic Consultative Council's (ECSECC) 5-year strategy. *The Applicant will prioritise employment of local people wherever possible, as well as develop local skills to make it possible in cases where those skills do not exist in the local workforce.*

PROVINCIAL DEVELOPMENT

Goal 4 of the 2030 Provincial Development Plan envisions vibrant, equitably enabled communities. In particular the universal access to social infrastructure. Within the PDP it is outlined that a potential constraint on economic potential within the Eastern Cape is the high municipal charges (electricity, water, rates) and deteriorating delivery quality.

Strategic action 1.1.6: Position the province as a key investment hub in the energy sector and ensure reliable energy supply to high-potential sectors

The Eastern Cape Province aims to draw in investment for the energy sector (wind farms, imported liquefied natural gas, shale-gas and nuclear energy). The proposed establishment of the Powerships and transmission lines directly supports this strategic action. It is hoped that the attraction of investment could be a great facilitator for economic development.

Strategic action 1.5.8: Grow and develop the ocean economy

The province envisions there to be growth within the port, maximising the Port's potential. The Powerships project will greatly support this initiative.

Eastern Cape Strategic Plan 2020 – 2025

The vision for the Eastern Cape Province is that "By 2030, the Eastern Cape will be an enterprising and connected province where all people reach their potential". The main focus is aligned to the 2030 Provincial Development Plan (PDP). Outcome 2 of the Strategic Plan 2020 - 2025 "An inclusive economy that grows sustainably, created decent jobs and is innovative." From the preceding sections that a sustained energy supply is a foundation for economic growth. The proposed Powership project supports this vision in enabling economic growth and job creation. Outcome 2 ties in with the United Nation's Sustainable Development Goals, South Africa's National Development Plan and the Eastern Cape's Provincial Development Plan all aim to halve poverty, end hunger and reduce inequality by 2030. Energy dependent

Nelson Mandela Bay Municipality Draft Integrated Development Plan – 2017/18 – 2021/22

The Nelson Mandela Bay Municipality Integrated Development Plan (IDP) cites one of the economic challenges as an unstable electricity grid dominated by coal powered energy. The proposed Powership project aligns to the Nelson Mandela Bay Municipality's Electricity and Energy Directorate mandate of environmentally friendly, sustainable and cost effective electricity supply to the national grid.

The proposed project is proposed within the Strategic Environmental Zone of the Port and immediately adjacent Special Economic Zone at Coega.

6.2 MOTIVATION FOR THE NEED AND DESIRABILITY OF THE ACTIVITY IN THE CONTEXT OF THE PREFERRED LOCATION

Being a ship-based power generating operation (as opposed to land-based) with transmission of energy to land-based transmission connection points, locations that provide infrastructure suitable for the proposed technology were identified, which are essentially deep water ports. In addition to the Port of Ngqura, there are two other projects of a similar nature being proposed by Karpowership in Richards Bay and Saldanha for which separate applications for environmental authorisation are being submitted.

The bulk of the Project is to be located in the Port of Ngqura which is adjacent to the Coega Special Economic Zone, originally established as an Industrial Development Zone in 1999. It falls within the Nelson Mandela Bay Metropolitan Municipality (NMBM) in the Eastern Cape Province. The Coega SEZ, is managed by the Coega Development Corporation (CDC) and the Port of Ngqura, falls under the jurisdiction of by the Transnet National Ports Authority (TNPA).

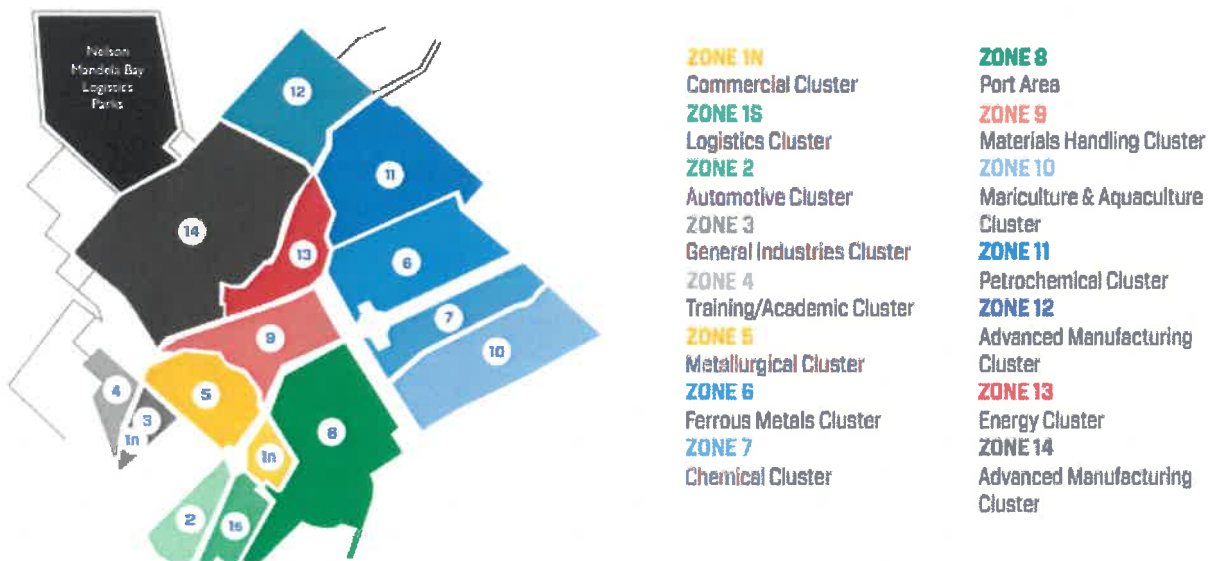


Figure 6-10: Coega SEZ Zones

The Port and Coega SEZ create opportunities through clusters that facilitate synergy and supply chain integration. Zone 8 Port Area and Zone 13 – Energy Cluster enable the location of the proposed project as per the lay-out and provisions of the Energy Cluster.

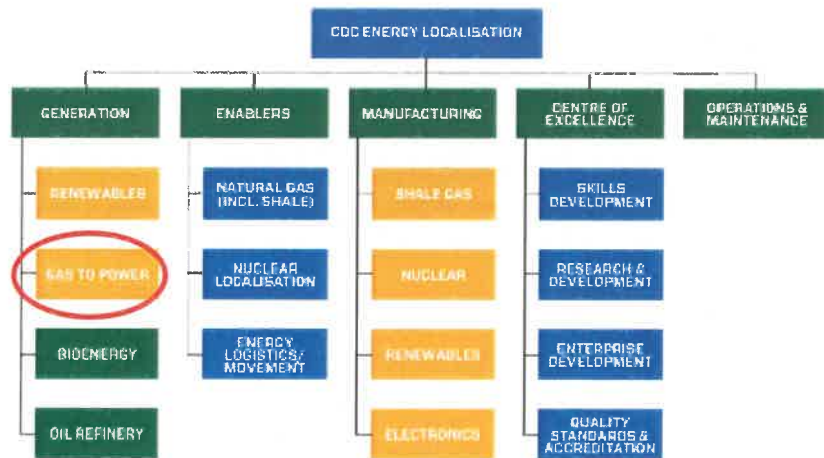


Figure 6-11: Coega IDZ Cluster Zones

As the Coega SEZ and Ngqura Port meet the requirements for the proposed Powership Project, this is the preferred location, and no other sites within this region are proposed for this project. Other Ports such as Port Elizabeth were considered and evaluated as a potential site, however it was not selected as there were navigational issues associated and for this reason the Port of Ngqura was considered.

Compared to conventional land-based power plants, Powerships utilizes less water and resource use. The use of coal-fired power stations by the South African power utility has dominated the energy supply sector of South Africa, however, this non-renewable resource is not deemed sustainable and deemed more polluting than the use of LNG.

The proposed gas to power project offers reliable power generation facility that is required to address both the immediate power shortfalls, as well as the longer term increasing demand for electricity.

7 PUBLIC PARTICIPATION PROCESS

2014 EIA Regulations (as amended), Appendix 2 – 2(1) a scoping report must include (g)(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; and (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;

7.1 NOTIFICATION OF INTERESTED AND AFFECTED PARTIES

In terms of Regulation 41(2) of the EIA Regulations, 2014, notice must be given to all potential interested and affected parties of the application by-

- (a) *fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of—*
 - (i) *the site where the activity to which the application or proposed application relates is or is to be undertaken; and*
 - (ii) *any alternative site;*

A total of three A2 site notices were placed within the site area. After communication with CDC, site notices in three languages (English, Afrikaans and iXhosa) were placed on the electronic noticeboard on CDC main building, site entrance to the Port Registration Office and at the Port entrance notifying I&APs of the proposed activity and inviting them to register as I&APs. Photographic evidence of the site notice placements is provided in Appendix D3 and D4.

- (b) *giving written notice, in any of the manners provided for in section 47D of the Act, to—*
 - (i) *the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
 - (ii) *owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
 - (iii) *the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;*
 - (iv) *the municipality which has jurisdiction in the area;*
 - (v) *any organ of state having jurisdiction in respect of any aspect of the activity; and*
 - (vi) *any other party as required by the competent authority;*

A Background Information Document (BID) and Notice of Application (NOA) was emailed in three languages (English, Afrikaans and Xhosa) to identified Stakeholders and I&APs on 21st September 2020, including landowners, the municipal ward councillor and the Ratepayers Association, and the following organs of state were furnished with the document: Department of Energy, Eskom, Department of Water and Sanitation, Department of Forest, Fisheries and the Environment, [Local Municipality](#), South African Heritage Resource Agency (SAHRA), South Africa Maritime Safety Authority, South African National Roads Agency, National Energy Regulator of South Africa (NERSA), South African National Roads Agency (SANRAL), Eastern Cape Provincial Heritage Resources Authority (ECPHRA), Eastern Cape Parks and

Tourism Agency, Department of Economic Development, Environmental Affairs and Tourism (DEDEAT): Cacadu Region, Department of Agriculture, Forestry and Fisheries, Department of Environmental Affairs (DEA) Oceans and Coasts. Refer to Proof in Appendix D7.

Refer to Appendix D7 - Proof of Notification and copies of BID and NOA.

- (c) *placing an advertisement in—*
- (i) *one local newspaper; or*
 - (ii) *any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;*
- (d) *placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii); and*

Advertisements were placed in two newspapers in the following 3 languages on the following dates:

- Herald Newspaper: English, Afrikaans and Xhosa- published on 22nd September 2020; and
- Daily Dispatch Newspaper: English- published on 21st September 2020 and Afrikaans and Xhosa- published on 23rd September 2020.

(Refer to Appendix D5 and Appendix D6 for copies of adverts and proof of placement)

Ongoing and other communication methods

In addition, in an effort to notify I&APs in the surrounding community, A5 flyers were placed at the following locations:

- CDC;
- Transnet Admin Building;

These flyers had similar text to the Site notices providing I&APs/ Stakeholders with information relating to the project. Refer to Appendix D3 and Appendix D4.

During Scoping, the BID (including registration and comments forms) were made available to I&APs on request. While I&APs were encouraged to submit comments and queries in writing, they were also invited to contact the EAP consultants telephonically if they so wished. These contact details appeared in the advertisements, onsite notices, BID, NOA and flyers.

Additional Media Sources:

Since commencement of the public participation process on the 21st September 2020, the public assisted in expanding the reach through the following methods:

- <https://oceansnotoil.org/2020/10/09/gas-to-power-powerhip-project-register-as-interested-affected-party/>
- <https://www.egsa.org.za/fossil-fuels/notice-of-ea-and-ael-application-the-proposed-gas-to-power-powerhip-project-port-of-ngqura-eastern-cape/>
- <https://web.facebook.com/WESSAEastCape/posts/wessa-algoa-bay-branchplease-read-through-the-letter-below-from-triplo4-sustaina/2816169225282489/?rdc=1&rdr>
- https://www.reddit.com/r/southafrica/comments/ik6kjq/turkish_floating_gas_power_ships_applied_for/

- <https://www.egsa.org.za/?s=triplo4>
- <https://www.dailymaverick.co.za/article/2020-10-18-turkish-floating-gas-power-ships-sail-into-public-consultation-process-after-back-door-passage-to-sa-freezes-up/>

Refer to Appendix D 11 – Additional Media Sources for proofs

Public Meetings:

Phelamanga, an independent public participation specialist was appointed to facilitate the public participation process. The following initiatives were planned and implemented, in order to ensure that all I&APs and Stakeholders are provided with a reasonable opportunity to participate.

An ‘Online Open Week’ allowed for active sharing of information with I&APs through the following activities:

- The draft Scoping Report was made available before the Webinar dates.
- All I&APs were encouraged to send through any questions for the EAP and specialists in advance of the webinar dates.

In terms of a public meeting, an online Q&A webinar was facilitated by Phelamanga, with the attendance and presentations done by the applicant, EAP and specialists. The aim was to encourage questions, comments and engagement instead of passive presentations. The format of the webinars were as follows on 13th October 2020 and 16th October 2020:

- 13 October 2020- Morning: 10h00-12h00; and Evening: 18h00-19h30) in order to allow for all I&APs to participate. (Technical problems experienced during the 10am meeting on 13 October 2020 halted the proceedings half-way and the second half of the meeting had to be rescheduled for the morning of 16 October 2020).
- 16 October 2020- Morning: 10h00-12h00- was scheduled to accommodate the technical issues experienced during the morning session on 13 October 2020.

Minutes of the meeting are attached as Appendix D12.

Draft Scoping Report Review

The draft Scoping Report was made available for review for a period of 30 days (06 October 2020 – 06 November 2020- extended dates) and hard copies were placed at the following venues, as advertised:

- Cllr Offices: Corner of Sityhotyholweni Street and Jijana Street, Wells Estate (Proof of Submission is located in Appendix D4)
- Triplo4 Ballito Offices: Suite 5, The Circle, Douglas Crowe Drive, Ballito; and
- Triplo4 Website: www.triplo4.com.

No requests or comments were made to view the hardcopy of the draft scoping report at either location.

7.2 PRE-APPLICATION MEETING WITH COMPETENT AND APPROVAL OF PUBLIC PARTICIPATION PLAN

A virtual pre-application meeting was held with DEFF on 17th September 2020 via Microsoft Teams (minutes attached as Appendix H1). A public participation plan was subsequently approved by DEFF according to which the public participation process is being conducted. Other points discussed in the meeting and addressed in the report include assessing the compatibility of the proposed project with Port's planning, assessing cumulative impacts (to be further assessed during the next phase of the application process), and the involvement of the DEFF air quality branch. The assessment of the decommissioning phase will be included in the next EIA phase.

7.3 REGISTER OF INTERESTED AND AFFECTED PARTIES

A proponent or applicant is required to open and maintain of a register of interested and affected parties and submit such a register to the competent authority, which register must contain the names, contact details and addresses of—

- (a) all persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;
- (b) all persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and
- (c) all organs of state which have jurisdiction in respect of the activity to which the application relates.

An I&AP register has been opened and a copy of it is included in Appendix D7, although contact details of private persons have been omitted in interests of privacy. The register will be updated on an ongoing basis during the EIA process. A full copy of the IAP register has been submitted with the final Scoping Report to DEFF.

7.4 COMMENTS AND RESPONSES TRAIL REPORT

44. (1) The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.
- (2) Where a person desires but is unable to access written comments as contemplated in sub regulation (1) due to—
 - (a) a lack of skills to read or write;
 - (b) disability; or
 - (c) any other disadvantage;
 - (d) reasonable alternative methods of recording comments must be provided for.

All concerns, comments, viewpoints and questions (collectively referred to as 'issues') submitted or raised by I&APs were documented and responded to in the Comment and Response Report, including an indication of how these issues have been incorporated into the Scoping Report, alternatively the reasons for not including them.

Refer to Appendices D9 Comments and Response Report - which includes the comments received by Stakeholders and I&APs during the PPP, and the associated responses.

8 PRELIMINARY IMPACT ASSESSMENT

This Environmental Scoping Study (ESS) aims to identify the potential positive and negative impacts (both biophysical and social) associated with the Proposed Powerhip Project. The potential impacts have been identified through baseline investigations and below are a summary per phase.

8.1 METHODOLOGY TO DETERMINE AND RANK NATURE, SIGNIFICANCE AND CONSEQUENCES OF IMPACTS

2014 NEMA EIA Regulations (as amended), Appendix 2(v) the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts; (vi) the methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; viii) the possible mitigation measures that could be applied and level of residual risk; (ix) the outcome of the site selection matrix.

| Rating of Impacts | |
|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Consequence | |
| Nature | 1 – Insignificant / Non-harmful 2 – Small / Potentially harmful 3 – Significant / Slightly harmful 4 – Great / Harmful 5 – Disastrous / Extremely harmful |
| Duration | 1 – Up to 1 month 2 – 1 month to 3 months 3 – 3 months to 1 year 4 – 1 to 10 years 5 – Beyond 10 years / Permanent |
| Spatial Scale | 1 – Immediate, fully contained area 2 – Surrounding area 3 – Within business unit area or responsibility 4 – Within mining boundary area / Beyond BU boundary 5 – Regional, National, International |
| Overall Consequence = (Severity + Duration + Extent) / 3 | |
| Likelihood | |
| Frequency of the Activity | 1 – Once a year or once / more during operation / LOM 2 – Once / more in 6 months 3 – Once / more a month 4 – Once / more a week 5 – Daily / hourly |
| Probability of the Incident / Impact | 1 – Almost never / almost impossible 2 – Very seldom / highly unlikely 3 – Infrequent / unlikely / seldom 4 – Often / regularly / likely / possible 5 – Daily / highly likely / definitely |
| Overall Likelihood = (Frequency + Probability) / 2 | |
| Overall Environmental Significance = Overall Consequence X Overall Likelihood | |
| Overall Environmental Significance: | |
| 0 - 2.9 | Very Low |
| 3 - 4.9 | Low |
| 5 - 6.9 | Medium - Low |
| 7 - 8.9 | Medium |
| 9 - 10.9 | Medium - High |
| 11 and above | High |

Some of the impacts in the table below will be expanded on in the EIR once more information is available from the various specialist studies. Impacts scoring a higher significance in the Scoping Report, will receive more attention in the EIR. The impacts identified below are therefore not the complete list, as there may be more impacts identified in the specialist reports and through the public participation process. Please note that scoring and assessment of impacts as well as discussion of mitigations below are **preliminary** and that a more detailed assessment will be provided in the EIR.

Refer to Section 8.2 for the impacts and mitigation measures associated with the proposed activity.

8.2 PRELIMINARY IMPACT ASSESSMENT

The following potential impacts were considered in the Preliminary Impact Assessment Phase for the proposed project:

8.2.1 Preliminary Specialist Findings

According to GCS (Geohydrological Assessment, 2020), the risk and impact assessment undertaken suggest that the potential geohydrological impact at the site (quantity and quality) is low-marginal:

- Risks during the construction phase is low and can be considered reversible impacts.
- Marginal impacts are anticipated for the operational phase of the transmission lines, pylons, gas pipeline and subsequent transforms connecting the Karpowership Mobile unit to the electricity grid.
- No decommissioning phase is anticipated for this project. However, similar risks as for the construction phase are anticipated if the facilities at the site are ever decommissioned; or if additional facilities are constructed.

8.2.2 Hydropedology

Due to the project type (i.e. linear development over a large area, where only a small soil area will be disturbed) no impacts on hydropedological flow drivers are anticipated (GCS- Hydropedology Assessment, 2020). In context, this would mean that a 'no change' in the hydropedological processes is predicted to occur for the proposed activities relating in no likely change in PES or EIS. Based on the project type, no hydropedological flow buffers will be required (GCS- Hydropedology Assessment, 2020).

8.2.3 Ambient Air Quality

An Atmospheric Impact study was conducted by the Air quality specialists in June 2020. According to the Atmospheric Impact report (AIR), the air quality impact associated with the proposed Karpowership Project is assessed based on the predicted ambient SO₂, NO₂ and PM₁₀ concentrations. The Karpowership Project was assessed alone, and the additive effect of the project to ambient air quality in the Coega SEZ was also assessed. This AIR has focused on potential human health impacts. An assessment of the atmospheric impact of the facility on the environment was therefore not undertaken as part of this AIR.

The maximum predicted annual SO₂, NO₂ and PM₁₀ concentrations and the 99th percentile concentration of the 24-hour and 1-hour predicted concentrations are very low relative to the NAAQS.

Table 8-1: Maximum predicted ambient annual SO₂, NO₂ and PM₁₀ concentrations in µg/m³ and the predicted 99th percentile concentrations for 24-hour and 1-hour, with the South African NAAQS

| Description | SO ₂ | | |
|------------------------------------|-----------------|---------|--------|
| | Annual | 24-hour | 1-hour |
| Predicted maximum SO ₂ | 0.09 | 0.74 | 1.7 |
| NAAQS | 50 | 180 | 350 |
| NO ₂ | | | |
| Predicted maximum NO ₂ | 1.75 | | 33.6 |
| NAAQS | 40 | | 200 |
| PM ₁₀ | | | |
| Predicted maximum PM ₁₀ | 0.43 | 3.65 | |
| NAAQS | 40 | 75 | |

(Source: uMoya-Nilu, 2020)

The consequence and likelihood scores listed in Table 8-2 for the Project with the Project adding to existing ambient concentrations, showing the impact significance.

Table 8-2: Air Quality Impact Scores

| Description | Pollutants | Consequence | Likelihood | Significance | |
|----------------------|------------------|-------------|------------|--------------|----------|
| | | | | Score | Rating |
| Karpowership Project | SO ₂ | 2 | 1 | 2 | Very low |
| | NO ₂ | 2.7 | 1 | 2.7 | Very low |
| | PM ₁₀ | 2 | 1 | 2 | Very low |
| Additive assessment | SO ₂ | 2 | 1 | 2 | Very low |
| | NO ₂ | 2.7 | 1 | 2.7 | Very low |
| | PM ₁₀ | 2 | 1 | 2 | Very low |

It was concluded that with low predicted ambient concentrations for SO₂ and PM₁₀ the consequence of impacts is very low. The predicted ambient NO₂ are somewhat higher, but the consequence of the impact is low. Furthermore, in terms of odour it is not anticipated that the odour will be above any odour detection limit for Sulphur Dioxide. The likelihood of occurrence of impacts associated with SO₂, NO₂ and PM₁₀ is very low. Therefore, the significance of impacts resulting from the Project is predicted to be very low. The consequence and likelihood air quality scores for the Project with the Project adding to existing ambient concentrations, showing the impact significance.

The following are the main findings of the AIR:

- **Severity** - the severity of the impact associated with SO₂ and PM₁₀ for the Karpowership Project is predicted to be insignificant, and the severity associated with NO₂ is predicted to be low.
- The additive effect of the contribution from the Karpowership Project is predicted to be very small and the potential increase in ambient concentrations is highly unlikely to result in exceedances of the National

Ambient Air Quality Standards (NAAQS). The severity of the additive impact associated with SO₂ and PM is predicted to be insignificant, and small for NO₂.

- **Spatial Scale** - In all cases the predicted ambient concentrations are low relative to the NAAQS and the highest predicted concentrations occur over the Coega SEZ.
- **Consequences** - the consequence of increased ambient concentrations of SO₂, NO₂ and PM₁₀ from emissions from the Karpowership Project is predicted to be low.
- **Frequency** - impacts are unlikely to occur and the frequency is therefore predicted to be very low.
- **Probability** - the probability of impacts occurring is unlikely and is therefore predicted to be almost never.
- **Likelihood** - likelihood of air quality impacts occurring is also low.
- **Significance** - the significance of any impacts is predicted to be very low.

8.2.4 Climate Change

These potential impacts are, however, mitigatable with appropriate management measures. The likelihood and significance of the above risks is rated as low and the project is likely to result in an overall increase in adaptive capacity rather than a decrease. Any climate change risks associated with the Port of Ngqura site are thus considered to be low and fully mitigatable with the implementation of appropriate measures (Thermis Environmental- Coastal Impact Assessment, 2020).

With regards to storm event, while uncertainty exists concerning the specific frequency of future extreme events such as coastal storm surges, general global trends indicate that an increase in both the frequency and intensity of such events, particularly under a high-emissions scenario, should be expected. Proposed activities in exposed or risk-prone areas should therefore adopt a precautionary and risk-averse approach to both the design and location of infrastructure, to ensure that damage is avoided when extreme events occur. Good practice in this regard is to adopt a medium- to long-term approach (between 20 and 50 years) by adequately incorporating anticipated future conditions in the detailed design phase of infrastructure, such as subsea pipelines and transmission lines, that are proposed for installation in exposed areas. For coastal storm surges, this would likely entail designing proposed project infrastructure to withstand events with 1:50 year return periods, or possibly 1:100 year events to account for extreme scenarios.

8.2.5 Noise

The potential noise impacts may include the following:

- Noise from the establishment of the berthing, gas reticulation and electrical reticulation infrastructure.
- Construction areas and temporary workshops / storage areas.
- Construction equipment and vehicle noise.
- Noise from the Power Ship, FSRU and LNGC. This will impact on the local residents, the avifauna as well as terrestrial fauna in the vicinity of the project. The noise will include audible, low frequency and infra sound.
- Noise from the tug and towing operations resulting in surface and underwater noise.

A more detailed noise assessment will be conducted in the EIA phase.

8.2.6 Cumulative Impacts

The project site is located within the existing and operational port of Ngqura and the COEGA SEZ. This area is characterised by light and heavy industrial operations, with further planning to expand the port and the operations at the SEZ.

Some of the other proposed gas to power projects identified within the area include –

- 200 MW Risk Mitigation Power Project in the Coega IDZ. The overall project would broadly involve the following components:
 1. A thermal power generating plant, with a generation capacity of 200 MWe;
 2. Storage of Liquefied Natural Gas (LNG) at the power generating plant;
 3. A dedicated mooring for a Floating Storage unit (FSU) within the Port of Ngqura for unloading of LNG from an LNG Carrier (LNGC);
 4. A floating truck carrier to ferry road tankers to and from the FSU Facilities; and
 5. Transport of LNG by road tanker from the Port of Ngqura to the power plant in the Coega SEZ.
- Proposed "Risk Mitigation Power Project" in the Coega SEZ for Engine Southern Africa. The overall project would broadly involve the following components:
 1. A thermal power generating plant, with a generation capacity of 200 MWe;
 2. Storage of Liquefied Natural Gas (LNG) with associated regasification facilities at the power generating plant;
 3. A dedicated mooring for a Floating Storage unit (FSU) within the Port of Ngqura for unloading of LNG from LNGC;
 4. A floating truck carrier to ferry road tankers to and from the FSU Facilities; and
 5. Transport of LNG by road tanker from the Port of Ngqura to power plant in the Coega SEZ.
- Scoping Report for the Proposed Development of a DNG Energy (Pty) Ltd Gas to Power Facility and associated infrastructure In Coega 1 within the Jurisdiction of the Nelson Mandela Bay Metropolitan Municipality, Eastern Cape Province. This will involve the implementation of a floating storage regasification unit and associated infrastructure.

Given the similar proposed projects and current operations within close proximity to the study area, cumulative impacts can potentially occur. Anticipated cumulative impacts, based on information available at the time of the assessment, and as relevant to this Powership project, will be assessed and included in the next phase of the EIA process, as per the Plan of Study included in this report.

Regarding other proposed projects in the area, it must be noted that limited information was obtained and the information is not finalised. At this stage, the approach of the Independent Power Producer (IPP) Procurement Programme is not clear, and it will have to be further confirmed whether only one bidder or more will be selected for the programme, and as such affecting the potential cumulative impacts. Furthermore, at this stage, only the proposed scope can be assessed (based on information available), and any changes to the scope as a result of the permitting process and the final project outcome (e.g. authorised alternatives) are unknown and thus cannot be assessed. Should the competent authority holds relevant information to assist with the identification and assessment of cumulative impacts, the authority is requested to share the information with the EAP.

Communication with CDC, an independent contractor assessing the cumulative air quality impact assessments for CDC and SANPARKS requesting information pertaining to cumulative aspect had occurred and no information has been received to date.

8.2.7 Preliminary Impact Assessment

The following table present the site specific impacts with mitigation measures.

8.2.7.1 Liquefied Natural Gas (LNG) Carrier

| NATURE AND CONSEQUENCES OF IMPACT & RISKS | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS | PROPOSED MANAGEMENT/ MITIGATION | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION |
|--------------------------------------------------------------------------------------------------|--------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------|
| Anchors destroy marine habitat in the Port | 12 | High | No marine structures are planned and the mooring system for the vessels will generally be heavy chain lying on the seabed attached to anchors. Marine aquatic assessment to determine most suitable area for mooring. | 7.5 | Medium |
| Leak of LNG due to improper connection for re-stocking leading to contamination of surface water | 9.0 | Medium-High | Quality check undertaken immediately after connection to ensure that connection point is secure. | 4,0 | Low |
| Discharge of LNG into marine environment due to pipeline bursting leading to marine pollution | 10.8 | Medium-High | Regular inspections on the quality and integrity of the pipeline. | 4,0 | Low |
| Disturbance to the marine ecosystems from operation of the LNG carrier in the Port | 5.0 | Medium-Low | Social compact (as part of KPS Social Corporate Responsibility) with Addo Elephant National Park, Port Authority, Municipality and Environmental Authority(ies) regarding the monitoring, reporting and rehabilitation of impacted mammals. Proposed location to be established adjacent to or in close proximity to the FSRU. | 2.0 | Very Low |
| Disturbance to the sediment from mooring | 8.0 | Medium | Complete activities within a short | 4.0 | Low |

| NATURE AND CONSEQUENCES OF IMPACT & RISKS | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS | PROPOSED MANAGEMENT/ MITIGATION | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------|
| infrastructure leading to increased suspended solids and reduction in sunlight infiltration. | | | timeframe as per standard operating procedures. No mooring infrastructure required. | | |
| Water and waste produced during the re-stocking leading to marine pollution | 4.7 | Low | LNG Carrier re-stocks FSRU once every 20 days. | 2.5 | Very Low |
| Air emissions from the operation of engines and turbines to produce energy. SO ₂ , NO ₂ and PM ¹⁰ emissions, adversely affecting ambient air quality and human health. | 1.0 | Very Low | Point source emissions monitoring and annual submissions to SAAELIP shall be provided throughout the contract term. No mitigation measures required as per the Atmospheric Impact Report. | 1.0 | Very Low |
| Cumulative Impacts | | | | | |
| Contributions to climate change from operations and emissions of the LNG carrier (cumulatively) | 17.3 | High | LNG Carrier re-stocks FSRU once every 20 days. | 4.0 | Low |
| Destruction of marine ecosystem from the operations of the LNG carrier in the Port. | 14.0 | High | Quality check undertaken immediately after connection to ensure that connection point is secure. Inspection on the quality and integrity of the pipeline. | 2.0 | Very Low |
| Increased traffic congestion and accidents | 3.0 | Low | Placement of LNG Carrier in accordance with Port approval. | 1.3 | Very Low |

8.2.7.2 Floating Storage Regasification Unit (FSRU)

| NATURE AND CONSEQUENCES OF IMPACT | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS | PROPOSED MANAGEMENT/ MITIGATION | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION |
|---------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------|
| Anchors destroy marine habitat in the Port. | 12 | High | No marine structures are planned and the mooring system for the vessels will generally be heavy chain lying on the seabed attached to anchors. Marine aquatic assessment to determine most suitable area for mooring. | 7.5 | Medium |
| Leak of LNG due to improper connection for re-stocking leading to contamination of surface water | 9.0 | Medium-High | Quality check undertaken immediately after connection to ensure that connection point is secure. | 4,0 | Low |
| Discharge of LNG into marine environment due to pipeline bursting leading to marine pollution | 10.8 | Medium-High | Inspection on the quality and integrity of the pipeline. | 4,0 | Low |
| Disturbance to the marine ecosystems from operation of the LNG carrier in the Port | 11.7 | High | Limited and localised footprint. Located out of the open space system within existing port. | 5.8 | Medium-Low |
| Disturbance to the sediment from mooring infrastructure leading to increased suspended solids and reduction in sunlight infiltration. | 8.0 | Medium | Complete activities within a short timeframe as per standard operating procedures. Ships to be berthed at the deep water port. | 4.0 | Low |
| No energy generation or gas delivery activities associated with the terrestrial environment. | 5.8 | Medium-Low (Positive) | | 5.8 | Medium-Low (Positive) |
| Water and waste produced during the re-stocking leading to marine pollution | 4.7 | Low | All effluent and solid (general, hazardous and domestic) waste will be disposed through registered and certified service providers as per | 2.5 | Very Low |

| NATURE AND CONSEQUENCES OF IMPACT | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS | PROPOSED MANAGEMENT/ MITIGATION | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------|
| | | | the NPA and MARPOL requirements. Waste must be stored in a designated area. Service provider must be contracted to remove waste and dispose to a licensed waste disposal facility. | | |
| Air emissions from the operation of engines and turbines to produce energy. SO ₂ , NO ₂ and PM ¹⁰ emissions, adversely affecting ambient air quality and human health. | 1.0 | Very Low | Point source emissions monitoring and annual submissions to SAAELIP shall be provided throughout the contract term. No mitigation measures required as per the Atmospheric Impact Report. | 1.0 | Very Low |
| Cumulative Impacts | | | | | |
| Destruction of marine ecosystem from the operations of the LNG carrier in the Port. | 14.0 | High | Quality check undertaken immediately after connection to ensure that connection point is secure. Inspection on the quality and integrity of the pipeline. | 2.0 | Very Low |
| Increased traffic congestion and accidents | 3.0 | Low | Placement of FSRU in accordance with Port approval. | 1.3 | Very Low |

8.2.7.3 Gas pipeline from the FSRU to Powerships (Surface)

| NATURE AND CONSEQUENCES OF IMPACT | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS | PROPOSED MANAGEMENT/ MITIGATION | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION |
|----------------------------------------------------------------------------------------------------|--------------|--------------------------------|------------------------------------------------------------|--------------|-------------------------------------------------|
| Marine disturbance and leakage of the gas pipeline to the as line between the FSRU and Powerships. | 9.0 | Medium-High | Adhere to the recommendations of the estuarine specialist. | 6.7 | Medium-Low |

| NATURE AND CONSEQUENCES OF IMPACT | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS | PROPOSED MANAGEMENT/ MITIGATION | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION |
|-------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------|
| Generation of small quantities of construction waste and accidental discharge or pollution of marine environment. | 5.8 | Medium-Low | Implement re-use, recycle and disposal to registered waste disposal site. Operational procedures and environmental incident management. | 2,0 | Very Low |
| Noise pollution from Installation and commissioning. | 7.5 | Medium | General EMPr conditions. | 2,0 | Very Low |
| Work and supplier opportunities will be created. | 12.0 | High (Positive) | Local labour and local supply companies to be utilised for project operations throughout the contract. General EMPr conditions. | 0,0 | High (Positive) |
| Natural Gas leaks from pipeline due to vandalism, and equipment or infrastructure failure | 9.2 | Medium-High | Specific EMPr conditions for gas pressure monitoring. Operational and Emergency procedures. Security Environmental incident reporting to CDC & Authorities Regular monitoring and maintenance. | 2,5 | Very Low |
| Cumulative Impacts | | | | | |
| Destruction of marine ecosystem from the installation and operation of the pipeline | 12.0 | High | Implement quality, maintenance and environmental controls. | 3.0 | Very Low |

8.2.7.4 Powerships

| NATURE AND CONSEQUENCES OF IMPACT | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS | PROPOSED MANAGEMENT/ MITIGATION | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------|
| Anchors destroy marine habitat in the Port | 12 | High | No marine structures are planned and the mooring system for the vessels will generally be heavy chain lying on the seabed attached to anchors. Marine aquatic assessment to determine most suitable area for mooring. | 7.5 | Medium |
| Leak of LNG due to improper connection for re-stocking leading to contamination of surface water | 9.0 | Medium-High | Quality check undertaken immediately after connection to ensure that connection point is secure. | 4,0 | Low |
| Discharge of LNG into marine environment due to pipeline bursting leading to marine pollution | 10.8 | Medium-High | Inspection on the quality and integrity of the pipeline. | 4,0 | Low |
| Disturbance to the marine ecosystems from operation of the LNG carrier in the Port | 11.7 | High | Limited and localised footprint. Located out of the open space system within existing port. | 5.8 | Medium-Low |
| Disturbance to the sediment from mooring infrastructure leading to increased suspended solids and reduction in sunlight infiltration. | 8.0 | Medium | Complete activities within a short timeframe as per standard operating procedures. Ships to be berthed at the deep water port. | 4,0 | Low |
| Waste generation from - General maintenance and repairs; - Domestic from cooking, etc.; - Sewage and greywater. Storage of waste on the ship being improperly disposed and therefore | 13.3 | High | All effluent and solid (general, hazardous and domestic) waste will be disposed through registered and certified service providers as per the NPA and MARPOL requirements. Waste must be stored in a designated area. | 2,0 | Very Low |

| NATURE AND CONSEQUENCES OF IMPACT | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS | PROPOSED MANAGEMENT/ MITIGATION | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------|
| impacting on the marine ecosystem | | | Service provider must be contracted to remove waste and dispose to a licensed waste disposal facility. | | |
| Generation of noise from engines and steam turbines affecting the ambient noise quality | 15.0 | High | The IDZ allows a maximum of 70 DBA. Noise level monitoring performed at existing Powership site established the ambient noise to be 50 dBA at 100m from the ship. | 4,7 | Low |
| Air emissions (SO ₂ , NO ₂ and PM ¹⁰). from the operation of engines and turbines to produce energy affecting the ambient air quality. Project to commence with the generation of 540 MW. | 2.0 | Low | Point source emissions monitoring and annual submissions to SAAELIP shall be provided throughout the contract term. No mitigation measures required as per the Atmospheric Impact Report. | 2,0 | Very Low |
| Change in discharged water quality from internal processes and cooling thus affecting the seawater quality. | 12.8 | High | Water that is discharged does not undergo any treatment or addition of any chemicals. All black and grey wastewater generated during operation of Powership facilities shall be transferred to a subcontracted licensed Environmental Service Company for appropriate off-site treatment and disposal. | 2,0 | Very Low |
| Indiscriminate disposal and spillage of waste; Oil or gas leaks or accidental spillage; Fire | 15.2 | High | Incident dependent (Localised). Implement approved emergency and contingency plans. | 3,5 | Low |

| NATURE AND CONSEQUENCES OF IMPACT | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS | PROPOSED MANAGEMENT/ MITIGATION | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------|
| and explosions resulting in pollution. | | | Conduct drills and training for emergencies. | | |
| Generation of electricity and provision of 540MW into the national grid improving electricity provision. | 17.3 | High | Positive impact on economy and community from reliable and continuous electricity flow from the Powerships. | 0,0 | High (Positive) |
| Skilled service providers required for maintenance creating employment. | 14.7 | High | Positive impact on economy and community, skill and knowledge from internationally recognised training. | 0,0 | High (Positive) |
| Aesthetic value of the area changes due to location of powerships. | 9.3 | Medium-High | No mitigation. | 9,3 | Medium-High |
| Potential change in temperature from heating from energy processes and cooling from FSRU. Increase in seawater temperature in the 100m and 300m mixing zones radii affecting the tolerance of marine organisms. | 9.0 | Medium-High | Plume modelling and managing of the mixing zone to remain within the 3 degree Celsius MARPOL requirements. The Powerships operate a once through cooling system, which abstracts water directly for cooling and discharges into the sea. Discharge at a depth of 8m as specified in the Cooling Water Dispersion Modelling | 3,0 | Low |
| Cumulative Impacts | | | | | |
| Contributions to climate change from operations and emissions of the powerships (cumulatively) | 17.3 | High | Use of LNG – cleaner burning fuel, positively cleaner and greener preference over other fossil fuels. | 4.0 | Low |

| NATURE AND CONSEQUENCES OF IMPACT | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS | PROPOSED MANAGEMENT/ MITIGATION | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION |
|------------------------------------------------------------------------------------|--------------|--------------------------------|------------------------------------------------------------|--------------|-------------------------------------------------|
| Destruction of marine ecosystem from the operations of the powerships in the Port. | 18.7 | High | Adhere to quality, maintenance and environmental controls. | 3.0 | Low |
| Increased traffic congestion and accidents | 3.0 | Low | Placement of powership in accordance with Port approval. | 1,3 | Very Low |

8.2.7.5 132kV Transmission lines to Substation

| NATURE AND CONSEQUENCES OF IMPACT | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS | PROPOSED MANAGEMENT/ MITIGATION | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION |
|----------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------|
| Overhead powerlines from the ship to the services servitude affecting the marine environment | 2,3 | Very Low | No establishment of transmission infrastructure within the marine environment or along the seabed. | 2,0 | Very Low |
| Vegetation clearance for overhead or underground lines. Clearance of indigenous vegetation leading to loss of biodiversity | 8,3 | Medium | Existing servitudes to be used in as far as possible. Servitude negotiations are currently underway. Area identified is in an Industrialised area that has been largely transformed. All alien vegetation occurring within the servitude must be cleared on an ongoing basis. | 6,0 | Medium Low |
| Disturbance to the terrestrial ecosystem affecting organism movement flight paths of birds | 8,3 | Medium | Existing servitude is to be used. Biodiversity Assessment (Faunal and Floral), as well as Avian faunal Assessment to be conducted. Single double circuit lattice | 5.3 | Medium Low |

| NATURE AND CONSEQUENCES OF IMPACT | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS | PROPOSED MANAGEMENT/ MITIGATION | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION |
|------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------|
| | | | steel towers/ monopoles, Eskom approved Bird-Friendly design are to be used. | | |
| Generation and improper disposal of small quantities of construction waste resulting in localised contamination of water resources | 6,7 | Medium-Low | Implement re-use, recycle and disposal to registered waste disposal site. General EMP conditions e.g. pollution prevention measures. | 4,7 | Low |
| Small amount of water ponding and localised erosion may occur from water run-off | 5,8 | Medium-Low | Storm water management plan is to be implemented in conjunction with sound erosion control measures. | 4,7 | Low |
| Release of dust from the construction activities and vehicles affecting ambient air quality | 3,0 | Low | Existing access routes are to be used to minimise erosion. | 1,3 | Very Low |
| Construction noise impacting on ambient noise quality | 5,8 | Medium-Low | Activity takes place along existing servitude and in an industrialised area that has been transformed. | 2,5 | Very Low |
| Work and supplier opportunities will be created. Skilled service providers required for maintenance creating further employment | 9,3 | Medium-High | Positive Impact - Contractors will be required for the construction and maintenance of the powerlines. | 0,0 | Medium - High (Positive) |
| Occupational health and safety risks such as falls and injuries | 10,0 | Medium-High | All labourers are to subscribe to the Health and Safety Act as will be outlined during Site Induction. | 3,5 | Low |
| Risk of veld fires leading to destruction of the surrounding environment | 9,2 | Medium-High | Electrical infrastructure holds internal failsafes to ensure lines shortcircuiting do not cause fires or explosions. Servitudes | 3,0 | Low |

| NATURE AND CONSEQUENCES OF IMPACT | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS | PROPOSED MANAGEMENT/ MITIGATION | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION |
|------------------------------------------------------------------------------------------------------|--------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------|
| | | | will be maintained as free of vegetation. | | |
| Cumulative Impacts | | | | | |
| Contributions to climate change from large environmental footprint and improper sourcing of material | 5.0 | Medium-Low | Use of existing servitudes to minimise environmental footprint. Use of sustainably sourced materials and construction methodologies. | 3.3 | Low |

8.2.7.6 132kV Steel Lattice Towers/ Monopoles Towers

| NATURE AND CONSEQUENCES OF IMPACT | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS | PROPOSED MANAGEMENT/ MITIGATION | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION |
|------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------|
| Civil works to establish the foundation of the steel lattice towers/monopoles resulting in destruction of vegetation | 6,7 | Medium-Low | Steel lattice towers/ monopoles for powerline are to be established along the existing services servitude. Exposed soils to be protected using a suitable covering or revegetating. | 2,0 | Very Low |
| Vegetation clearance for construction and operation of the steel pylons for the transmission lines leading to loss of biodiversity | 10,0 | Medium-High | Existing servitudes to be used in as far as possible. Area is previously disturbed. Retain as much indigenous vegetation as possible. | 6,0 | Medium Low |
| Disturbance to the terrestrial ecosystem during maintenance leading to loss of biodiversity | 8,3 | Medium | Existing servitudes are to be used, which are previously disturbed industrial area. | 5,3 | Medium Low |

| NATURE AND CONSEQUENCES OF IMPACT | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS | PROPOSED MANAGEMENT/ MITIGATION | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION |
|--------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------|
| Change in hydrogeological processes such as soil interflow, soil structure and soil quality leading to decrease in soil productivity | 8,0 | Medium | 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. Soil quality monitoring & visual assessments. | 2,5 | Very Low |
| Generation of small quantities of construction waste leading to localised contamination of water resources. | 6,7 | Medium-Low | Implement re-use, recycle and disposal to registered waste disposal site. General EMP conditions e.g. pollution prevention measures. | 4,7 | Low |
| Minimal amount of water ponding and localised erosion may occur from water run-off | 5,8 | Medium-Low | Storm water management plan is to be implemented in conjunction with sound erosion control measures. Water quality monitoring of the downstream surface water. Dewater all groundwater to the nearest surface drain/watercourse. | 4,7 | Low |
| Dust from construction vehicles leading to change in ambient air quality | 3,0 | Low | Existing access routes are to be used to minimise erosion. | 1,3 | Very Low |
| Construction noise affecting ambient noise quality | 5,8 | Medium-Low | Activity takes place along existing servitude and in an industrialised area. | 2,5 | Very Low |
| Work and supplier opportunities creating employment | 9,3 | Medium-High | Contractors will be required for the construction and maintenance of the powerlines. | 0,0 | Medium - High (Positive) |

| NATURE AND CONSEQUENCES OF IMPACT | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS | PROPOSED MANAGEMENT/ MITIGATION | IMPACT SCORE | SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION |
|------------------------------------------------------------------------------------------------------|--------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------|
| Occupational health and safety risks such as falls and injuries | 10,0 | Medium-High | All are to subscribe to the Health and Safety Act as will be outlined during site induction. | 3,5 | Low |
| Cumulative Impacts | | | | | |
| Contributions to climate change from large environmental footprint and improper sourcing of material | 5.0 | Medium-Low | Use of existing servitudes to minimise environmental footprint. Use of sustainably sourced materials and construction methodologies. | 3.3 | Low |

9 PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASSESSMENT

Appendix 2 of the EIA Regulations requires that the Scoping Report contain a plan of scoping for undertaking the next phase, which is the EIA process. The specific reporting requirements are as follows:

According to Appendix 2, Section 2(1), of the EIA Regulations 2014 (as amended) a "scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include -

(h) a plan of study for undertaking the environmental impact assessment process to be undertaken, including—

- (i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;*
- (ii) a description of the aspects to be assessed as part of the environmental impact assessment process;*
- (iii) aspects to be assessed by specialists;*
- (iv) a description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists;*
- (v) a description of the proposed method of assessing duration and significance;*
- (vi) an indication of the stages at which the competent authority will be consulted;*
- (vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and*
- (viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process;*
- (ix) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored*

The plan of study for undertaking the EIA process is part of the draft Scoping Report that is made available to I&APs for comment during Scoping. In response to I&AP comments, including those from the respective authorities and input from specialists, the plan of study will be revised in the final Scoping Report.

The competent authority will consider the final Scoping Report in relation to the comments submitted by I&APs, including State Departments during Scoping, and should it accept the Scoping Report, it will do so with or without conditions, and advise the applicant to proceed or continue with the tasks contemplated in the plan of study for EIA.

The issues and impacts that are identified through Scoping will be taken through a more detailed assessment and subjected to a second round of public participation. The plan of study for EIA thus proposes how this will be done. An Environmental Management Programme (EMPr) will also be compiled during the EIA phase and *inter alia* contain the mitigation measures to either avoid, or minimise and remedy the identified impacts. It too will be subjected to public participation during the EIA Phase, as will the specialist reports.

9.1 Alternatives

The following alternatives will be considered and assessed within the preferred site (Refer to Section 3 of this report) in the EIA process:

- Layout Alternatives:

- Two alternative mooring sites are being considered. Both these positions are deemed feasible pending the scoping phase interaction with TNPA and therefore both these and the preferred selection will be assessed. The first option, Alternative 1, is to position the two Powerships adjacent to the administrative craft basin and the FSRU along the eastern breakwater. Alternative 1 is deemed the preferred position from an engineering design perspective, as the Powerships and FSRU are not located close to each other and are positioned adjacent to the break bulk quay /multi-purpose terminal. The second option, Alternative 2, is to position the two Powerships closer to the liquid bulk terminal and the FSRU along the curved portion of the eastern breakwater. Alternative 2 is considered less suitable from an engineering perspective, as the Powerships and the FSRU are located too close together and would be an issue in terms of navigational aspects. Alternative 1- is the preferred as it is in line with the FSRU in the port’s long term FSRU berth position plans. Figures 3-4 and 3-5 show the alternatives for the positioning of the Powerships.
- Two Transmission line options are being investigated for the route- Figures 3-6 indicates the preferred option from an ecological and engineering perspective (preferred Alternative 1). Alternative 2 (Figure 3-7) presents, as per the yellow line is the second option for the proposed power evacuation route. Transmission line Connection point: Engagements with Eskom on the connection to the line, by either tie in to the Dedisa substation.
- Two alternative routes for the gas pipeline. This will be investigated unless a clear preference by TNPA will be provided during the Draft scoping interactions. The gas pipeline connecting the FSRU to the Powerships will be routed along the edge of the existing eastern breakwater and will connect to the vessels via a flexible marine hose. The gas pipeline will likely be mounted on small footings requiring minor civil works to be constructed and installed. There are two proposed alternative routes for the gas pipeline, and these are directly influenced by the selected positions of the Powerships in relation to the position of the FSRU. Alternative 1 of the gas pipeline route (Figure 3-8) is preferred from an engineering perspective, as it is in line with the preferred position (from an engineering design perspective) of the Powerships and the FSRU within the Port, positioning the Powerships in closer proximity to the land and the transmission line (Powerships position – Alternative 1). Alternative 2 of the gas pipeline route (Figure 3-10) is aligned to the second alternative of the Powerships positions (further from the shore) and the FSRU. Although this alternative presents a shorter gas pipeline, the position of the Powerships in relation to the shore are not supported from an engineering perspective, and therefore the associated gas pipeline is not supported from the engineering design perspective.
- No-Go Option (current status-quo prevails)
 - In respect of the Project, it would mean that the existing status quo would prevail and that no additional power using this particular technology will be generated and transmitted for inclusion into the energy grid in the Eastern Cape and Nelson Bay Metropolitan Municipality in particular.

9.2 Aspects to be assessed as part of the EIA process

One of the objectives of Scoping is to identify the aspects to be addressed in the assessment phase. The following aspects have been identified and will be supplemented based on the comments submitted by I&APs, including organs of state and State Departments during Scoping and any additional specialist that may be necessary.

| Aspects to be addressed | Company & Specialist |
|---------------------------------------------|--------------------------------------|
| Wetland Delineation and Functionality | <i>Triplo4 - Mr. Suheil M Hoosen</i> |
| Terrestrial Ecological (Transmission Lines) | <i>Ms Leigh Anne de Wet</i> |
| Heritage & Palaeontology Impact | <i>ACRM - Mr. Jonathan Kaplan</i> |

| | |
|--------------------------------------------|-----------------------------------------------------------------------------------------|
| Estuarine Impacts | <i>GroundTruth - Ms Catherine Meyer & Coastwise Consulting -Ms Tandi Breetzke</i> |
| Coastal and Climate Change Impact | <i>Themis - Mr. Luke Moore & Coastwise- Ms Tandi Breetzke</i> |
| Geohydrological, Hydrology & Hydropedology | <i>GCS Water and Environmental Consultants - Mr. Henri Botha & Mr. Gareth Preen</i> |
| Hydrological & 1:100 Year Floodline | <i>GCS Water and Environmental Consultants - Mr. Henri Botha & Mr. Gareth Preen</i> |
| Aquatic Aspects | <i>GCS Water and Environmental Consultants - Ms Karin Lukes & Mr. Gareth Preen</i> |
| Major Hazardous Installation | <i>Occutech cc - Mr. Harold Gaze</i> |
| Marine Ecology | <i>Lwandle - Dr Robin Carter & Ms Laura Weston</i> |
| Air Quality Impact | <i>uMoya-Nilu - Dr Mark Zunckel</i> |
| Socio-Economic Impact | <i>Lumec - Mr. Paul Jones</i> |
| Noise | <i>Safetech - Dr Brett Williams</i> |
| Avifauna | <i>Birds & Bats Unlimited - Dr Rob Simmons</i> |
| Thermal Plume & Marine Traffic | <i>PRDW – Mr Warwick Donaldson & Mr Derek Paul</i> |
| Greenhouses Gas Emissions Assessment | <i>Southern Cross Capacitating Corporation (PTY) LTD</i> |
| Power Evacuation Routes | <i>SIRIS – Dr. Kishoor Pitamber</i> |

9.3 Impact Assessment Methodology

Another of the prescribed objectives of Scoping is to agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site.

The objective of the assessment of impacts is to identify and assess all the significant impacts that may arise as a result of the proposed development. The process of assessing the impacts of the project encompasses the following four activities:

- Identification and assessment of potential impacts;
- Prediction of the nature, magnitude, extent and duration of potentially significant impacts;
- Recommendation of mitigation measures to be implemented to avoid or reduce the severity or significance of the impacts of the activity;
- Evaluation of the significance of the impact after the mitigation measures have been implemented and determining the extent of any residual impacts that need to be managed and monitored.

The possible impacts associated with the project are identified in the Scoping phase through available information, desktop research, preliminary specialist input and I&AP comments. In the EIA phase, these aspects will be assessed through more in-depth specialist investigations which will also be subjected to public participation.

The proposed method of assessing the environmental impacts is set out below as well as the proposed specialist studies. The reporting of the EIA findings in the EIA Report will follow the requirements prescribed in Appendix 3 of the EIA Regulations, 2014.

| Rating of Impacts | |
|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Consequence | |
| Nature | 1 – Insignificant / Non-harmful 2 – Small / Potentially harmful 3 – Significant / Slightly harmful 4 – Great / Harmful 5 – Disastrous / Extremely harmful |
| Duration | 1 – Up to 1 month 2 – 1 month to 3 months 3 – 3 months to 1 year 4 – 1 to 10 years 5 – Beyond 10 years / Permanent |
| Spatial Scale (extent) | 1 – Immediate, fully contained area 2 – Surrounding area 3 – Within business unit area or responsibility 4 – Within mining boundary area / Beyond BU boundary 5 – Regional, National, International |
| Overall Consequence = (Severity + Duration + Extent) / 3 | |
| Likelihood | |
| Frequency of the Activity | 1 – Once a year or once / more during operation / LOM 2 – Once / more in 6 months 3 – Once / more a month 4 – Once / more a week 5 – Daily / hourly |
| Probability of the Incident / Impact | 1 – Almost never / almost impossible 2 – Very seldom / highly unlikely 3 – Infrequent / unlikely / seldom 4 – Often / regularly / likely / possible 5 – Daily / highly likely / definitely |
| Overall Likelihood = (Frequency + Probability) / 2 | |
| Overall Environmental Significance = Overall Consequence X Overall Likelihood | |
| Overall Environmental Significance: | |
| 0 - 2.9 | Very Low |
| 3 - 4.9 | Low |
| 5 - 6.9 | Medium - Low |
| 7 - 8.9 | Medium |
| 9 - 10.9 | Medium - High |
| 11 and above | High |

9.3.1 Specialist Studies

All specialists' assessments (including cumulative impacts) and findings will be incorporated into the EIA Report. Specialists will also be required to address any additional relevant issues raised by I&APs during Scoping.

The following Specialist Studies will inform the EIA Phase of the assessment:

9.3.1.1 Atmospheric Impact Assessment

An Atmospheric Impact Report has been undertaken by uMoya-NILU Consulting (Pty) Ltd, in order to assess the potential air quality impacts from the proposed project. The assessment includes a:

- Description of current state of the receiving atmospheric environment using available monitoring data;

- Description of the legal environment including regulations and the requirements of the Licensing Authority;
- Development of an emission inventory for the Project including emissions from LNG supply vessels;
- Predictive modelling using the DEFF recommended CALPUFF dispersion model according to the DEFF modelling guideline (Government Gazette No. 36804, Notice No. 589, 11 Jul 2014), to predict ambient concentrations of all relevant substances or mixture of substances resulting from emissions for the proposed project;
- Assessment of impacts on ambient air quality of the proposed project and the implications for human health considering the predicted ambient concentrations relative to the National Ambient Air Quality Standards (NAAQS), and using EIA criteria for impact significance.

These initial findings show that with low predicted ambient concentrations for SO₂ and PM₁₀ the consequence of impacts is very low. The predicted ambient NO₂ is somewhat higher, but the consequence of the impact is low. The likelihood of occurrence of impacts associated with SO₂, NO₂ and PM₁₀ is very low. Therefore, the significance of impacts resulting from the Project is predicted to be very low. The specialist will consider I&AP comments submitted during Scoping and the specialist report will be made available for comment during the EIA process. [The likelihood of occurrence of impacts associated with SO₂, NO₂ and PM₁₀ is very low. Therefore, the significance of impacts resulting from the Project is predicted to be very low.](#)

[Cumulative impacts will be addressed in the EIA Report, based on the following input from the air quality specialist:](#)

[The inclusion of emission from future and other sources in an assessment to assess their cumulative effect in an area is not deemed a practical exercise. The assessment that is being conducted for the proposed project and cumulative impacts are assessed using current ambient air quality data and the potential additive effect of the project. In the case on this proposed project, the predicted ambient concentrations resulting from LNG combustion are very low. It is unlikely that that they will make a measurable difference \(within the accuracy of the monitoring equipment\) to current ambient concentrations. In the specialist's opinion, a cumulative assessment including existing and future other sources will not provide an answer that is any different to that currently included in the scope of the Atmospheric Impact Assessment.](#)

[It very difficult to characterise fugitive emissions, transport \(vehicles and shipping\), wind dependant emissions like storage piles and open land, fires, agricultural emissions, and others that vary temporally and spatially. The complexity of the problem to develop an inclusive emission inventory to simulate ambient concentrations on an hourly basis and to assess these under worse-case meteorology can be appreciated. Always excluded is the contribution of emission sources outside the region of interest that also contribute to the areas air quality. In Richards Bay, this is particularly important as the background \(not attributed to local sources\) PM₁₀ concentration is relatively high. The approach to include emissions for other sources in a cumulative assessment is flawed if all emissions are not included and characterised spatially and temporally.](#)

[By comparison, ambient air quality monitoring is influenced by all possible contributing sources including those outside the area of interest, and measures continuously, i.e. during good dispersion conditions and in worse-case conditions. Assessing the modelled contribution of the project's emissions to the monitored \(existing\) ambient concentrations is far more meaningful and provides a sound science-based indication of what future ambient concentrations might if the project was operational in the area.](#)

9.3.1.2 Wetland Delineation and Functionality Assessment

A Wetland Screening has been conducted at desktop level, to identify the water management areas and any watercourses within the study area. Due to the presence of watercourses, further specialist study is required for the EIA phase, which will:

- Identify all potential wetland and riparian areas within 500m of the proposed development based on aerial photography and available wetland/river coverage;
- Site visit and field delineation of wetlands and/or riparian areas within 500m of the proposed development that are primarily affected by the development using the Department of Water Affairs & Forestry guideline manual "A practical field procedure for the identification and delineation of wetlands and riparian areas" (DWAF, 2005);
- Delineation of all wetland and riparian areas within 500m of the proposed development that are not directly affected by the development using aerial photography and satellite imagery;
- Classification of delineated wetlands/riparian areas using the latest National Wetland Classification System for Wetlands and other Aquatic Ecosystems in South Africa;
- Conduct a wetland screening of the wetlands and watercourses on site and within the 500m to identify wetlands and watercourses that are potentially at risk from the proposed development based on specialist expertise;
- Wetland buffer zone recommendations for construction and operational phases of the proposed development based on best-practice and available buffer zone guidelines;
- Develop a wetland map showing the extent of wetland areas occurring within 500m of the proposed development site with applicable buffer zones/development setback recommendations shown;
- The findings of the wetland delineation and risk assessment will determine the wetland functional assessment requirements. A wetland functional assessment will be conducted as per the methods outlined below;
- WET-Health Level 1 rapid assessment to establish the Present Ecological State (PES) of wetland areas (Macfarlane et al., 2008);
- An assessment of the importance of wetland areas in providing ecosystem goods and services according to the WET-EcoServices assessment tool (Kotze et al., 2009);
- Rating of the Ecological Importance and Sensitivity (EIS) of the wetland areas using the WET-EIS tool (Rountree, 2013);
- Recommendation of management and mitigation measures to deal with potential impacts to wetlands/rivers;
- Undertake a risk assessment of the wetlands considered to be potentially at risk from the proposed development using the risk assessment tool developed by the DWS (2015) "Aspects and impact register/risk assessment for water courses including rivers, pans, wetlands, springs, drainage lines"; and
- Outcomes of the risk assessment, together with the assessment of the proposed activities on site (including bulk service provisions) will determine whether a Water Use Authorisation is required for the site.

9.3.1.3 Ecological Assessment (Transmission Lines)

As vegetation will need to be cleared to erect the transmission lines, there will be an impact on biodiversity in the area. Thus, a specialist study is needed to determine the ecological impacts (flora and fauna) of the proposed development on the site. The study will determine the vegetation of the study area, any areas of specific ecological sensitivity, and the general ecological sensitivity of the area. The report will also identify the likely impacts

associated with the proposed development and recommend mitigation measures to reduce negative impacts of the proposed development.

Scope of work includes the following:

- Identify and map the vegetation communities
- Determine the type of vegetation within the study site and place it in context for the wider area
- Identify and record the main plant species that occur within the project area
- Where possible identify any flora species of specific concern (SSC)
- Take a GPS point for each of the protected species occurring on site
- Record any animal species encountered through opportunistic sightings and active searching
- Where possible identify any animal species of conservation concern
- Assess the extent of alien plant species over the site, and associated risks of alien invasion as a result of any proposed development
- Identify any significant landscape features or rare or important vegetation/faunal associations such as wetlands or rocky areas that might support rare or important vegetation/faunal associations
- Place the project area within the biodiversity context of the wider area in terms of vegetation, conservation areas and Critical Biodiversity Areas as mapped by existing guidelines both nationally and provincially
- Determine and map the sensitivity of the site
- Determine and rate the likely impacts associated with the proposed development; and
- Recommend mitigation measures that can be used to reduce negative impacts of the proposed development.

This assessment will be undertaken as per the NEMA, Environmental Themes, and Protocols for Biodiversity (published on 20 March 2020).

9.3.1.4 Marine Ecological Assessment

A specialist study is required to determine the baseline / status–quo description describing aspects of the marine environment that may be affected by the proposed development and assess the impacts of the project on the marine environment, [which include entrainment losses](#).

Lwandle, the appointed specialist will conduct a site visit, where after collate the available information comprising but not limited to scientific literature, previous studies carried out in the area, any relevant local reports as well as findings gathered during the site investigation. This report will describe the ecological significance and sensitivity of the area.

Following this, the impact assessment methodology (provided by Triplo4) will be applied to produce a Specialist Marine Ecology EIA and EMP. The report will succinctly identify and evaluate predicted impacts and will assess a realistic scenario for the proposed development influenced by the level of project design information.

The results of hydrodynamic modelling by PRDW, the project engineers will be utilised to assess the potential impacts of mainly temperature dispersion plumes and other discharges that may occur. This report will also outline measures to manage residual impacts and identify monitoring requirements.

9.3.1.5 Heritage & Palaeontology Impact Assessment

It is possible that heritage resources (cultural and natural) are present in the study area and if so, may be impacted on by the proposed development.

The desktop study will use various historical maps (1st edition topographical and aerial photographs) that can pinpoint human settlements that occurred in study area before increased urbanisation and commercial industry. In this case we have the 1937 aerial photographs and 1942 topographical maps to indicate older buildings and human settlements. This is important as the maps will indicate the potential for human graves, regardless of the current land use. These older maps are also useful for showing previous water table levels.

The initial archaeological survey (i.e. fieldwork) consists of a foot survey where the selected area is covered. The survey results will define the significance of each recorded site, as well as a management plan. If the archaeological visibility is poor then I survey in transects and concentrate on exposed areas, molehills and aardvark (or similar) holes where artefacts, middens etc. may have been exposed. Previous experience allows one to determine where sites are more likely to occur.

All sites are grouped according to low, medium and high significance for the purpose of this report. Sites of low significance have no diagnostic artefacts, especially pottery. Sites of medium significance have diagnostic artefacts and these are sampled. Sampling includes the collection of artefacts for future analysis. All diagnostic pottery, such as rims, lips and decorated sherds are sampled, while bone, stone and shell are mostly noted. Sampling usually occurs on most sites. Sites of high significance are excavated and/or extensively sampled. Those sites that are extensively sampled have high research potential, yet poor preservation of features. We attempt to recover as many artefacts from these sites by means of systematic sampling, as opposed to sampling diagnostic artefacts only.

A management plan for each site will be given as well as a general management plan for the area. This will include a heritage audit.

A palaeontological study will also be conducted following the "SAHRA APM Guidelines: Minimum Standards for the Archaeological & Palaeontological Components of Impact Assessment Reports" which require the palaeontological impact assessment to:

- identify exposed and subsurface rock formations that are considered to be palaeontologically significant;
- assess the level of palaeontological significance of these formations;
- comment on the impact of the development on these exposed and/or potential fossil resources and
- make recommendations as to how the developer should conserve or mitigate damage to these resources.

In preparing a palaeontological study the potential fossiliferous rock units (groups, formations etc.) represented within the study area are determined from geological maps and Google Earth imagery. The known fossil heritage within each rock unit is inventoried from the published scientific literature, previous palaeontological impact studies in the same region and the author's field experience.

The likely impact of the proposed development on local fossil heritage will be determined on the basis of the palaeontological sensitivity of the rock units concerned and the nature and scale of the development itself, most notably the extent of bedrock excavation envisaged.

9.3.1.6 Socio-economic Impact Assessment

A socio-economic impact assessment will be conducted focussing on the following aspects and adopting the following methodology:

- Review of all relevant project and government planning documents, including Port and municipal plans.
- Identify all the anticipated impacts of the proposed project and categorise according to duration of the impact, extent of the impact, significance, and probability of impact. These will include impacts identified by I&APs during Scoping.
- Development of a National and Provincial baseline for the electricity sector including GVA, employment and current electricity production, distribution and consumption.
- Development of a baseline for each geographic area of influence with regard to employment and GVA in total and for the electricity sector.
- Gain a detailed understanding of the technical operation processes (inputs, production processes, capacity, and distribution), employment (short vs long-term, local vs regional), and operational and capital expenditure (breakdown of construction/capital investment, human resource costs, operational expenditure, etc.).
- Undertake an analysis of information gathered and apply national multipliers to determine the direct and indirect impacts on GVA, business activity and employment.
- Assess the impact on the national power grid (capacity and pricing) and any impact on port operations
- Determine the socio-economic impacts of the proposed project on the national economy including impact on GVA, turnover and employment and the impact on the national power grid (capacity and pricing).
- Determine the compatibility of the project with Port and municipal planning.
- Determine the impacts of the proposed projects on the regional economies including impact on GVA, turnover and employment, impact on port capacity, and any other impacts on local communities.
- Draft specialist report in line with the requirements set out in Appendix 6 of the EIA Regulations, 2014.

9.3.1.7 Geohydrological Assessment

The geohydrological study will identify the in-situ geohydrological conditions of the site and focus on the proposed transmission line development and gas coupling areas. Subsequently, the potential impact on the groundwater aquifer, existing water users and surrounding water bodies will be determined. In addition to meeting the requirements set out in Appendix 6 of the EIA Regulations, the scope of work will also adhere to the requirements for groundwater studies in respect of water use licence applications.

The main objectives of the study will be as follows:

- Understand baseline groundwater quantity and quality that can be used as a benchmark for future comparison purposes. This will be achieved via a hydrocensus within a 2.5 km radius of the site and a site visit.
- Assess the status of groundwater resources in general and any fatal flaws and /or sensitive areas.
- Review public domain geophysical data for the site, to supplement the hydrogeology report.
- Understand all groundwater risks associated with the proposed activities on the groundwater environment.
- A hydrogeological and geological site conceptual model will be developed with data obtained for the study area
- A preliminary risk assessment will be conducted based on the Source-PathwayReceptor (SPR) model.
- A groundwater and surface water monitoring plan, with mitigation measures, will be developed for the site based on the baseline assessment of the site conditions.

- A geohydrological report encompassing all the work completed and a preliminary groundwater risk assessment and monitoring plan will be compiled.
- Present findings in an understandable and presentable format so that it can be used for decision-making purposes.

9.3.1.8 Hydrological & 1:100 Year Floodline Assessment

The hydrology study will identify the hydrological and climate conditions of the site, and to evaluate flooding risk for watercourses which fall in the vicinity of the proposed transmission lines. Subsequently, the potential risks of the hydrological environment, ecological water requirements, and risk towards existing water users and surrounding water bodies will be determined. The scope of work will also adhere to the requirements for groundwater and surface water studies required for water use licence applications in terms of the National Water Act, 1998. The study will include:

- Assess the study area hydrological functions.
- Undertake a site visit to confirm drainage lines and rivers.
- Investigate 1:10, 1:50 and 1:100-year peak flow return periods, to undertake conceptual flood line modelling. The aim is to identify possible exclusion zones.
 - The post-development impacts on runoff and peak flows will be determined, as well as impacts on baseflow to nearby watercourses.
 - The conceptual flood lines will present 1:50 and 1:100-year flood events.
- Assess surface water quality and compile a water monitoring plan; and
- Compile a detailed hydrological report with hydrological risks identified.

9.3.1.9 Aquatic Assessment

The aquatic assessment aims to ascertain, by means of rapid biomonitoring methods, the Present Ecological State (PES) of the various streams or drainage lines potentially impacted by the proposed 132kV transmission lines.

The scope of work for the aquatic assessment entails the following:

- Measuring in situ water quality variables at the time of sampling
 - Water quality will be measured at each aquatic biomonitoring site using a Hanna HI 98130 EC and pH meter and a HI 9146 Dissolved Oxygen and Temperature Meter for Aquaculture. The following parameters will be recorded: temperature (°C), pH, electro conductivity (EC) (mS/m), dissolved oxygen (% saturation) and oxygen content (mg/l).
 - The recorded values will be compared against the Target Water Quality Ranges (TWQRs) in terms of the South African Water Quality Guidelines for aquatic ecosystems (SAWQGs) (DWAf, 1996b) to ascertain whether any of the measured parameters were beyond the prescribed limits for healthy river ecosystems and therefore detrimental to aquatic organisms.
- Establishing the integrity of the aquatic habitat using the Invertebrate Habitat Assessment System (IHAS), Index of Habitat Integrity Assessment (IHIA), and visual assessment
 - The Index of Habitat Integrity (IHI) assessment will consider the impacts on the riparian and the instream habitats and describes their PES. The estimated impacts of all criteria will be calculated, expressed as a percentage to arrive at an assessment of habitat integrity for the instream and riparian components respectively.

The Integrated Habitat Assessment System (IHAS v2) will be used to assess the specific habitat suitability for the survival of aquatic macro-invertebrates and aid in the interpretation of the SASS5 results. The diversity and quality of the three habitat biotypes (Stone, Vegetation, and (GSM)) will be recorded, assessed and calculated for each site.

- Assessing the health of the watercourse(s) according to the aquatic macro invertebrates present by using the SASS5 Protocol:
 - Aquatic biomonitoring of river benthic (bottom dwelling) macro-invertebrates will be undertaken according to the DWA-endorsed SASS v.5 sampling protocol (Dickens & Graham, 2002), where suitable habitat conditions and safe accessibility prevails. The method utilises a semi-quantitative sampling approach, where the relative abundances of stipulated aquatic invertebrate taxa are recorded within a specific time limit. All sampling will be undertaken by an accredited SASS5 practitioner.
- Identify impacts (whether positive and/or negative), associated with the construction and operation of instream dams, as well as provide recommendations and mitigation measures.

9.3.1.10 Hydropedology Assessment

Following a similar approach to that required by the Water Use Licence Application & Appeal Regulations and associated DWS guidelines received, the hydropedology study will:

- A field soil survey using the South African soil classification system:
 - Soils are classified by hand augering to a depth of 3m or the restricting layer
 - Survey positions are recorded with a GPS and logged; and
- A hydropedological response based on the HOSASH (Le Roux et al., 2015) for Hillslopes of South African Soils and Hydrology is then undertaken.

To achieve the study objective, the following scope of work is proposed:

- Evaluate the soils in the study area:
 - Specialist reports and public data will be assessed.
 - Soils will be classified per the taxonomic system for South Africa (Department of Agricultural Development, 1991).
 - Soil permeability will be estimated based on available data and according to best practice guidelines (FAO, 1980); and (DWS, 2011).
 - Evaluate all available data to derive a soil distribution map.
- Derive hydropedological flow regimes and interaction areas:
 - In the determination of Hydrological Soil Types (HST), soils will be divided into classes based on their expected hydrological responses (Van Tol, Le Roux, & Lorentz, 2013)
- Conceptualise the water flow dynamics and derive hydropedological flow buffer areas (if required) for wetlands identified in the area.
 - Hydrological processes will be perceived from traceable signatures in the soil matrix resulting from the soil's ability to transmit, store and react with water (Le Roux, et al., 2011).
- Identify potential hydropedological impacts per the standard Department of Water and Sanitation (DWS) risk assessment methodology and Appendix 6 of the EIA Regulations.
- Mapping and reporting:
 - A project report will be produced by entailing the components above.

- Recommendations and study limitations will be discussed in the report.

9.3.1.11 Noise Impact Assessment

To assess the potential noise impacts from the Powership's engines and other sound generating components, on the receiving environment, a number of ambient measurements will be taken by placing a noise meter on a tripod and ensuring that it was at least 1.2 m from floor level and 1.4m from any large flat reflecting surface. One measurement will be taken at each point. All measurement periods will be at least over 10 minutes. The noise meter will be calibrated before and after the survey. The weighting used will be on the A scale and the meter placed on impulse correction, which is the preferred method as per Section 5 of SANS 10103:2008. As the noise may have a tonal correction 5 dB will be added to the measured noise level if applicable.

The scope of the Noise Impact Assessment will be as follows:

- Identify the major noise sources in both the Port of Ngqura.
- On-site measurement of current ambient noise as per the requirements of the "National Environmental Management Act, 107 OF 1998 - 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 Act when applying for Environmental Authorisation" – GN 320 of 20th March 2020. Page 53 – 56 Section on Noise.
- Model the noise impacts to include the:
 - LNG off-loading,
 - Regasification,
 - Power generation
- Provide a brief review of noise legislation and standards applicable in South Africa as well as international standards.
- Identify relevant protocols, legal and permit requirements.
- Identify potential noise impact mitigation measures.

Relevant noise related legislation will be identified. Where applicable, the following standards will be consulted.

- GNR 320 of 20 March 2020: National Environmental Management Act, 107 OF 1998 - 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 Act when applying for Environmental Authorisation". Page 53 – 56 Section on Noise.
- GNR.154 of January 1992: Noise control regulations in terms of section 25 of the Environment Conservation Act (ECA), 1989 (Act No. 73 of 1989)
- GNR.155 of 10 January 1992: Application of noise control regulations made under section 25 of the Environment Conservation Act, 1989 (Act No. 73 of 1989)
- SANS 10103:2008 Version 6 - The measurement and rating of environmental noise with respect to annoyance and to speech communication.
- SANS 10328: Methods for environmental noise impact assessments.
- SANS 10357: The calculation of sound propagation by the Concawe method.
- World Bank Guidelines on Pollution Prevention
- International Finance Corporation – 2007 General EHS Guidelines: Environmental Noise.

9.3.1.12 Risk Assessment

The handling, transporting and storage of natural gas pose a potential hazardous risk to people, property and the environment which DEFF has requested be assessed as part of the EIA process.

The specialist risk assessment will include the following:

- To use the methodologies prescribed in the Occupational Health and Safety Act No 85 of 1993 and Major Hazard Installation Regulations (GNR 692 of 30 July 2001) to determine if the facility is a Major Hazard Installation.
- To determine the worst case scenario. Should this identify an off-site consequence, then the other scenario would be determined and calculated.
- Both of the above would identify the need for the performance of a risk assessment. Its purpose would be to determine what circumstances, conditions could cause or have potential to cause a major incident, accident or disaster and how these circumstances/ conditions can reduce this potential.
- Obtain information on the site, its activities, processes, chemicals, operations, mitigation measures and use this information to determine the potential risk(s) to employees and general public.
- Perform site walk through assessment
- To determine the potential risk by identifying the likely hazards, the potential consequences of a hazardous event and its severity.
- It is accepted that the process and storage installations were designed using the correct design specifications and other relevant standards and that the installation was built by qualified professionals.
- The public in this report refers to all persons outside of the boundary of the facility.
- The consequences will be calculated using specifically-designed computer software.
- The risk calculations were performed using the SANS Code of Practice.

The Quantitative Risk Assessment (QRA) process is summarized with the following steps:

- Identification of components that are flammable, toxic, reactive or corrosive and that have potential to result in a major incident from fires, explosions or toxic releases;
- Development of accidental loss of containment (LOC) scenarios for equipment containing hazardous components (including release rate, location and orientation of release);
- For each incident developed in determination of consequences (such as thermal radiation, domino effects, toxic-cloud formation and so forth);
- For scenarios with off-site consequences (greater than 1% fatality off-site), calculation of maximum individual risk (MIR), taking into account all generic failure rates, initiating events (such as ignition), meteorological conditions and lethality;
- Using the population density near the facility, determination of societal risk posed by the facility;
- The results of the QRA are then used to make a determination of environmental significance of the impact of hazardous chemicals on the public.

9.3.1.13 Estuarine Impact Assessment

- Review of comments and feedback received on the scoping report from the Interested and Affected Parties (I&APs);
- Determine the requirements (if any) in order to address the comments, i.e. additional data collection or inclusion of the additional issues;

- Collect additional data, if required and add to the baseline information;
- Rate the potential estuarine impacts according to the methodology described in Section 9.4 above;
- Provide mitigation measures for each of the impacts identified;
- Produce an impact assessment report and submit to the EAP, for review by the authorities and I&APs;
- Obtain comments from I&APs on the impact assessment report and amend it accordingly, responding to the comments and issues raised, if necessary.

9.3.1.14 Coastal and Climate Change Assessment

The climate change adaptation assignment will assess the identified potential impacts — including cumulative impacts — of the proposed activities, based on:

- All other specialist reports produced as part of the EIA Phase;
- The public participation engagements; and
- The outputs of a climate change analysis for each site.

The climate change analysis will provide downscaled climate projections at the highest possible resolution for each of the three sites and will provide information on the anticipated trends for relevant climatic parameters. These parameters may include but are not necessarily limited to precipitation, temperature and extreme events. The Climate Change Impact Assessment will conclude with a suite of recommendations for each site to offset or mitigate potential negative impacts identified and optimise potential positive impacts.

9.3.1.15 Avifaunal Assessment

From the Screening Tool, SABAP 2 (Bird Atlas) data and local knowledge, determine the Avian Species of Conservation Concern (both terrestrial and marine) that are likely to occur in the area and that may be at risk of being impacted by the project.

It is anticipated that two Site Visits will be required – the first as part of the Initial Site Sensitivity Verification and to identify possible direct and indirect impacts due to the proposed project and the second primarily to assess the 132kV transmission line route options.

A report compliant with the following will be prepared:

GN320 (20 March 2020) Site Sensitivity Verification Requirements

GN9 (10 January 2020) Protocol for the Assessment and Reporting of Environmental Impacts on Terrestrial Animal Species (in the absence of a specific protocol for Avifauna Assessments)

Draft Species Environmental Assessment Guideline (SANBI 2020)

Appendix 6 (Specialist Reports) of the Environmental Impact Assessment Regulations

9.3.1.16 Visual Impact Assessment

The Visual Impact Assessment is to be undertaken in accordance with:

- [Aesthetic Specialists in EIA Processes](#), which is the only relevant local guideline, setting various levels of assessment subject to the nature of the proposed development and surrounding landscape; and
- [The Landscape Institute and Institute of Environmental Management and Assessment \(UK\) Guidelines for Landscape and Visual Impact Assessment](#) which provides detail of international best practice (technical methodology).

The following input will be undertaken:

- A desk top review of existing relevant information will be undertaken;
- A preliminary GIS desktop mapping exercise will be carried out, to identify potentially affected areas, immediately obvious sensitive receptors, key view points, and help define the character of the affected landscape;
- A site visit will be conducted to ground-truth the initial landscape character assessment, the affected areas, the Visual Absorption Capacity of the landscape as well as potential issues and impacts identified in the desktop exercise;
- Additional issues and sensitive receptors may be identified during the site visit;
- The necessary Landscape and Visual Impact Assessment (LVIA) Report will be produced detailing the analysis undertaken and providing an assessment in a form that can be easily integrated into the overall impact assessment.

9.3.1.17 Greenhouse Gas Emission Assessment

As in line with SA regulations, Karpowership assigned a third-party technical consultant to calculate annual greenhouse gas emissions for Powership operations.

The study has been conducted using the Global Warming Potential impact category developed by the Intergovernmental Panel on Climate Change (IPCC, 2013) on their fifth assessment report. The analysis covers only Scope I emissions direct emissions from natural gas burning. It contains heat recovery from generation engines through steam forming for the purpose of additional electricity generation via steam turbines.

9.4 STAGES AT WHICH THE COMPETENT AUTHORITY WILL BE CONSULTED

Prior to the submission of the final EIA report, inclusive of specialist reports and the EMPr, the competent authority will be consulted during the EIA process as follows:

- Should it at any time become necessary to deviate from the approved scoping report, including the plan of study, the competent authority will be immediately notified and approached for guidance.
- A copy of the draft EIA Report, inclusive of specialist reports and the EMPr will be submitted to the competent for comment, at the same time these reports are made available to I&APs, including State Departments, for comment.

9.5 PUBLIC PARTICIPATION PROCESS TO BE CONDUCTED DURING THE EIA PROCESS

The following public participation activities are planned for the EIA Phase:

9.5.1 I&AP Review of the Draft EIA Report, inclusive of specialist reports and EMPr

- Registered I&APs will be notified via email of the availability of the Draft EIA Report, inclusive of specialist reports and EMPr for comment. I&APs who don't have email will be notified telephonically or by SMS.
- Flyers announcing the availability of these reports will also be distributed locally and put up on public notice boards with assistance requested from the municipality and ward councillor.

- The Draft EIA Report will be made available to I&APs, including State Departments and DEFF for comment for period of 30 days.
- The report will be available:
 - on the Triplo4 website (www.triplo4.com).
 - electronically available via an online platform such as Dropbox or GoogleDrive, the link to which will be emailed to all registered I&APs.
 - Electronic copies will also be sent to DEFF and organs of state, including State Departments.
 - The public copy venue will be confirmed with the municipality and ward councillor and will depend on what public venues are open under the Covid-19 pandemic.
 - Other arrangements will be made to ensure people have access to the report should they be unable to access the public venue copy or an electronic copy.

9.5.2 I&AP engagement and recording of comments

A key component of the EIA Process is recording and responding to the comments received from I&APs and the authorities. Such comment is anticipated by way of:

- Written and emailed comments (e.g. emails, letters and completed comment and registration forms);
- Comments made at public meetings and/or focus group meetings (if required);
- Telephonic communication with Triplo4 project team; and
- One-on-one meetings with key authorities and/or I&APs (if required).

The comments received during the EIA phase will be recorded in a Comments and Responses Report for inclusion the final EIA Report that will be submitted to the DEFF for decision-making. All comments will be considered by the EIA team and appropriate responses provided by the applicant, EAP and/or relevant specialist.

9.6 TASKS TO BE UNDERTAKEN AS PART OF THE EIA PROCESS

Upon notification by the competent authority (DEFF), that the Scoping Report has been accepted, and subject to any conditions set by DEFF, the applicant will proceed or continue with the following tasks as contemplated in the plan of study for EIA:

- Undertake / finalise the specialist studies and specialist reports
- Draft the EIA Report and EMPr, incorporating the findings of the specialist studies
- Make the draft EIA Report, inclusive of specialist reports and EMPr available for a 30-day comment period, to I&APs, organs of state, including State Departments and the competent authority
- Consider and process all comments received and revise the EIA Report, specialist reports and EMPr accordingly;
- Submit the final EIA Report, inclusive of specialist reports, EMPr and I&AP Comments and Response report to the competent authority (DEFF) for consideration and decision-making.

9.7 IMPACT MITIGATION AND ENVIRONMENTAL MANAGEMENT PROGRAMME

Impacts that are identified and assessed as part of the EIA process, will be assessed before and after mitigation measures are applied, such mitigation measures having been recommended by the respective specialists, the EAP, the competent authority and I&APs, including organs of state. As part of this process, the extent of the residual risks

(i.e. the impacts that will likely remain even after mitigation is implemented) will be determined and measures proposed as to how these risks should be managed and monitored.

All mitigation measures, as well as the management and monitoring of residual risks, will be contained in an Environmental Management Programme (EMPr) as per the requirements of Appendix 4 of the EIA Regulations, 2014.

10 CONCLUDING STATEMENT

The Port of Ngqura was identified as a preferred location in the region, as it meets the specifications for the proposed Powership project and occurs within the SEZ. The Port and the CDC SEZ areas are considered a hub of economy. Two alternative mooring sites are being considered.

The proposed activity is the generation of electricity by Powerships using natural gas as a fuel and transmission of the generated electricity. This is the Karpowership's core business and as such, no other alternatives in terms of activities are considered feasible.

The proposed Powerships and FSRU will be moored in the Port of Ngqura. Feasible locations for the mooring sites were identified and preliminarily assessed. The two positions are deemed feasible pending interaction with TNPA and therefore both these and the preferred selection will be assessed. The first option, Alternative 1, is to position the two Powerships adjacent to the administrative craft basin and the FSRU along the eastern breakwater. Alternative 1 is deemed the preferred position from an engineering design perspective, as the Powerships and FSRU are not located close to each other and are positioned adjacent to the break bulk quay /multi-purpose terminal. The second option, Alternative 2, is to position the two Powerships closer to the liquid bulk terminal and the FSRU along the curved portion of the eastern breakwater. Alternative 2 is considered less suitable from an engineering perspective, as the Powerships and the FSRU are located too close together and would be an issue in terms of navigational aspects. Alternative 1- is the preferred as it is in line with the FSRU in the port's long term FSRU berth position plans.

The preferred gas pipeline route will be in line with the preferred positioning of the Powerships and the FSRU within the port and as such, both alternatives will be investigated. Two Transmission line options are being investigated for the route, however Alternative 1 is the preferred option from an ecological and engineering perspective (preliminary findings). Both these lines are subject to further assessments based on specialist findings and input from the CDC. Further engagements with Eskom on the connection to the Dedisa substation will be undertaken.

PLEASE NOTE:

- ***This is the FINAL Scoping Report that has been prepared by the EAP with input from the applicant, and specialists in accordance with the prescribed requirements in the EIA Regulations, 2014 and guidance from the competent authority.***
- ***Before this Final Scoping Report was submitted to the competent authority for consideration, it was subjected to a public participation process, the comments from which were incorporated into the Final Scoping Report.***
- ***Should the component authority accept the final Scoping Report, the EIA process will commence and need to be conducted in accordance with the approved plan of study for undertaking the EIA process (Section 9 of this Scoping Report) and any additional conditions that the competent authority may impose.***
- ***The EIA process requires a second round of public participation and the draft EIA Report, inclusive of specialist reports and the Environmental Management Programme (EMPr) will be made available for public comment.***

- ***Only then can the final EIA report be submitted to the competent authority and a decision made as to whether the application for environmental authorisation can be granted or refused.***
- ***If granted, the application for an atmospheric emission licence under the National Environmental Management: Air Quality Act of 2004 will be considered by the licensing authority.***

11 REFERENCES

- ARC. (2006). Land Types of South Africa. Pretoria: Agricultural Research Council.
- BERLINER, D. AND DESMET, P. 2007. Eastern Cape Biodiversity Conservation Plan Technical Report. Mainstream Biodiversity in Land Use Decision-Making in the Eastern Cape Province. DWAF Project No. 2005-012.
- BINNEMAN, J. 2010. A Phase 1 Archaeological Impact Assessment of the greater Coega Industrial Development Zone (IDZ), near Port Elizabeth, Nelson Mandela Bay Municipality, Eastern Cape. Province. Report prepared for Coega Industrial Development Corporation (Pty) Ltd. Eastern Cape Heritage Consultants, Jeffery's Bay.
- BIRDLIFE (2016) 'Important Bird and Biodiversity Areas of KwaZulu-Natal'. Birdlife South Africa. Available at: http://www.birdlife.org.za/wp-content/uploads/2018/06/IBA_KZN_2016_web.pdf
- CDC (no date), *CDC Guidance Note: Heavy Fuel Oil Fired Power Plants*, CDC Group plc. https://assets.cdcgroup.com/wp-content/uploads/2018/12/10150725/CDC_HFO-fired_Power_Guidance_2018.pdf [Accessed 05 October 2020]
- CEN. 1997. Feasibility study. Environmental impact report on a proposed harbour in the vicinity of Coega, Port Elizabeth. CEN Integrated Environmental Management Unit, Port Elizabeth.
- Degnarain, N (2020). What Is Heavy Fuel Oil, And Why Is It So Controversial? Five Killer Facts. Forbes Online Article, Aug 14, 2020,06:10pm EDT. <https://www.forbes.com/sites/nishandegnarain/2020/08/14/what-is-heavy-fuel-oil-and-why-is-it-so-controversial-five-killer-facts/#2885b0be74c0> [Accessed 05 October 2020]
- DEPARTMENT OF ENVIRONMENTAL AFFAIRS. (2019). South African National Land-Cover (SANLC) 2018. South Africa: DEA on 1st October 2019.
- DEPARTMENT OF ENVIRONMENT AFFAIRS AND TOURISM SOUTH AFRICA. 2007. Long Term Mitigation Scenarios, Strategic Options for South Africa. Scenario Building Team, October 2007.
- DMEA. (1991). 3324 Port Elizabeth - 1:250 000 Geological Series
- DWAF. (2006). Groundwater Resource Assessment II.
- DWS. (2016). New Water Management Areas. South Africa: Government Gazette No. 40279DEA, 2019.
- DER WAALS, J. G. (2019). Developing Wetland Distribution And Transfer Functions From Land Type Data As A Basis For The Critical Evaluation Of Wetland Delineation Guidelines By Inclusion Of Soil Water Flow Dynamics In Catchment Areas Volume 3. Wrc Report No. 2461/3/18.
- DICKENS, C.W.S. AND GRAHAM, P.M. (2002). The South African Scoring System (SASS) version 5 Rapid Bio assessment Method for Rivers. African Journal of Aquatic Sciences, 27: 1-10

DRIVER, A., NEL, J.L., SNADDON, K., MURRAY, K., ROUX, D.J., HILL, L., SWARTZ, E.R., MANUEL, J. AND FUNKE, N. 2011. Implementation Manual for Freshwater Ecosystem Priority Areas. Report to the Water Research Commission. WRC Report No. June 2011.

EASTERN CAPE PLANNING COMMISSION (2014) Eastern Cape Vision 2030 Provincial Development Plan (2014), Eastern Cape Planning Commission, Province of Eastern Cape.

EASTERN CAPE SOCIO ECONOMIC CONSULTATIVE COUNCIL (2020): Strategic Plan 2020 – 2025 (2020)

EOH. 2015. Independent Power Producers Programme: EIA For A Floating Power Plant, Port Of Ngqura, Eastern Cape Province, South Africa

ESCOTT, B, LIVINGSTONE, TC, NXELE, B, HARRIS, J, & JEWITT, D. 2012. Draft Document Describing The Conservation Planning Terms For The EKZNW Spatial Planning Products For Ezemvelo KZN Wildlife.

EZEMVELO KZN WILDLIFE, 2016. KZN Biodiversity Spatial Planning Terms and Processes, Version 3.3 Unpublished Report, Biodiversity Spatial Planning and Information Division, Ezemvelo KZN Wildlife.

GEOSCIENCES, 2011. Annual Technical Report of the Council for Geosciences.

GCS (October 2020): Desktop Hydopedology Assessment for the Proposed Karpowership Transmission Line – Coega Bay Port.

GCS (October 2020): Preliminary Aquatic Assessment for the Proposed Karpowership Transmission Line – Coega Bay Port.

GCS (October 2020): Desktop Hydrological Assessment for the Proposed Karpowership Transmission Line – Coega Bay Port.

GCS (October 2020): Geohydrological Assessment for the Proposed Karpowership Transmission Line – Coega Bay Port.

IRP. 2011. Integrated Resource Plan for Electricity 2010 – 2011. Department of Energy

JOB, N., LE ROUX, P., TURNER, D., VAN DER WAALS, J., GRUNDLING, A., VAN DER WALT, M., PATERSON, D. (2019). Developing Wetland Distribution And Transfer Functions From Land Type Data As A Basis For The Critical Evaluation Of Wetland Delineation Guidelines By Inclusion Of Soil Water Flow Dynamics In Catchment Areas. Volume 1. Pretoria: WRC Report No. 2461/1/18.

KAPLAN, J. 1993. The State of Archaeological Information in the Coastal Zone from the mouth of the Orange River to Ponto do Ouro. Report prepared for the Department of Environment Affairs & Tourism. ACRM, Riebeeck West

KING, G., MARITZ, E., & AND JONCK, F. (1998). 3324 PE - 1:500 000 Hydrological Map Series of the Republic of South Africa.

KLEYNHANS, C. J., AND LOUW, M. D. 2007. Module A: EcoClassification and EcoStatus determination in River EcoClassification: Manual for EcoStatus Determination (version 2). Joint Water Research Commission and Department of Water Affairs and Forestry report. WRC Report No. TT 329/08.

KOTTEK, M., GRIESER, J., BECK, C., RUDOLF, B., & RUBEL, F. (2006). World Map of the Köppen- Geiger climate classification updated. Meteorol. Z.15, 259-263. doi:10.1127/0941- 2948/2006/0130.

LEIGH DE WET (October 2020): Preliminary Terrestrial Ecological Assessment for the Proposed Gas to Power Project, Coega, Eastern Cape.

LUMEC, 2020. Socioeconomic Assessment - input on Demographics for the Port of Ngqura

MUCINA, L. AND RUTHERFORD, M. C. (EDS). 2006. The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

MUCINA, L. AND RUTHERFORD, M. C. 2012. Updated Vegetation of South Africa, Lesotho and Swaziland. South African National Biodiversity Institute, Pretoria.

NATIONAL DEVELOPMENT PLAN. 2030. Our Future-make it work, National Planning Commission, Department: The Presidency-Republic of South Africa

NEL, J.L., MURRAY, K.M., MAHERRY, A.M., PETERSEN, C.P., ROUX, D.J., DRIVER, A., HILL, L., VAN DEVENTER, H., FUNKE, N., SWARTZ, E.R., SMITH-ADAO, L.B., MBONA, N., DOWNSBOROUGH, L. AND NIENABER, S. (2011). Technical Report for the National Freshwater Ecosystem Priority Areas project. WRC Report No. K5/1801

NELSON MANDELA BAY MUNICIPALITY Draft Integrated Development Plan (IDP) – 2017/18 – 2021/22 (Fourth Edition)

PETTERSON, D. (2019). Unique port sand bypass system successfully mimics nature. Infrastructure News. [Online]. Available from: <https://infrastructurenews.co.za/2019/04/18/unique-port-sand-bypass-system-successfully-mimics-nature/>

SANBI, 2011. National Biodiversity Assessment. An Assessment of South Africa's biodiversity and ecosystems.

SHELL (2020). Natural Gas. <https://www.shell.co.za/energy-and-innovation/natural-gas.html> [Accessed 05 October 2020]

SOUTH AFRICAN WEATHER BUREAU (SAWB) (1998): Climate of South Africa, Climate Statistics up to 1990, WB40.

SOUTH AFRICAN WEATHER BUREAU (SAWB) (1992): Climate tables of South Africa, Climate Statistics, WB42.

SMITH, A. (2020): Archaeological Impact Assessment (Desktop Study) Proposed Karpowership At The Port Of Ngqura Within The Coega Industrial Development Zone Eastern Cape Province

THERMIS ENVIRONMENTAL (2020): Coastal and Climate Change scoping report for the proposed Powerships at Saldanha Bay, Port of Ngqura and Richards Bay

Transnet (2015): Transnet Preparations for Gas Infrastructure in South Africa. South Africa Gas Options Conference- 29 September 2015, Cape Town.

TRIPLO4 SUSTAINABLE SOLUTIONS- MALEK-HOSEN, S., (October 2020): *Wetland Delineation and Functional Assessment for the Proposed Transmission Lines in the Port of Ngqura, Nelson Mandela Bay Metropolitan Municipality, Eastern Cape.*

UMOYA-NILU (June 2020): Atmospheric Impact Report – Port of Ngqura.

WRIGHT, J.G. AND CALITZ, J.R., 2020. Setting up for the 2020s: Addressing South Africa's electricity crises and getting ready for the next decade. Version 1.1.

WRC. (2015). <http://www.waterresourceswr2012.co.za/resource-centre/>. Retrieved from Water Resources of South Africa, 2012 Study (WR2012). ARC, 2006

WRC (2018) The Critical Evaluation of Wetland Delineation Guidelines by Inclusion of Soil Water Flow Dynamics in Catchment Areas. Volume 1. Pretoria: Wrc Report No. 2461/1/18.

<https://oceansnotoil.org/2020/10/09/gas-to-power-powership-project-register-as-interested-affected-party/>

<https://www.egsa.org.za/fossil-fuels/notice-of-ea-and-ael-application-the-proposed-gas-to-power-powership-project-port-of-ngqura-eastern-cape/>

https://web.facebook.com/WESSAEastCape/posts/wessa-algoa-bay-branchplease-read-through-the-letter-below-from-triplo4-sustaina/2816169225282489/?_rdc=1&_rdr

https://www.reddit.com/r/southafrica/comments/jk6kjq/turkish_floating_gas_power_ships_applied_for/
<https://www.egsa.org.za/?s=triplo4>

<https://www.dailymaverick.co.za/article/2020-10-18-turkish-floating-gas-power-ships-sail-into-public-consultation-process-after-back-door-passage-to-sa-freezes-up/>