

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-1

SECTION 5.7: NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES

File name: 599270_ESK TSSR 5.7 Nearby Transportation, etc._Rev 0c

Author declaration: I declare that appropriate diligence and quality assurance was applied in the compilation of this report. As such I am confident in the results here described and the conclusions drawn.



Name: **L van Aarde** Date: **12/03/2026**

Peer Reviewer: I declare that this report has undergone independent peer review by myself, that comments were addressed to my satisfaction, and that as such, it is considered fit for publication.



Name: **N. van der Merwe** Date: **12/03/2026**

Project Manager Authorisation:

SRK Consulting - Certified Electronic Signature
 **srk consulting**
 599270/45091 Report
 9755-521-1387-HOLD-12/03/2026
 This signature has been printed digitally. The Author has given permission for its use for this document. The details are stored in the SRK Signature Database.

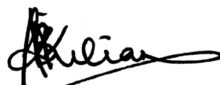
Name: **D. Holmes** Date: **12/03/2026**

Project Partner Authorisation:

SRK Consulting - Certified Electronic Signature
 **srk consulting**
 599270/45091 Report
 4947-5812-5487-ENGE-12/03/2026
 This signature has been printed digitally. The Author has given permission for its use for this document. The details are stored in the SRK Signature Database.

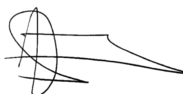
Name: **B. Engelsman** Date: **12/03/2026**

Eskom Technical Lead Nuclear Siting Studies Acceptance



Name: **A. Kilian** Date: **2026-03-18**

Eskom Employer's Agent Nuclear Siting Studies Acceptance:



Name: **I. Sekoko** Date: **2026-03-30**

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-2

AMENDMENT RECORD			
Rev	Draft	Date	Description
0		April 2015	New chapter. Thyspunt Site Safety Report compiled in support of Eskom's Nuclear Installation Site Licence for the Thyspunt site and submitted to the NNR.
0a		March 2024	Partial update of TSSR including NNR comments.
0b		January 2025	Update and respond to NNR.
0c		March 2026	Footer revised to be consistent with other TSSR sections. Port of Port Elizabeth replaced with Port of Gqeberha/Port Elizabeth

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-3

EXECUTIVE SUMMARY

This section of the Thyspunt Site Safety Report (TSSR) presents the characteristics of nearby transportation, industrial and military facilities in the site region. The information contained within this section informs evaluations undertaken for the purposes of nuclear safety in **Chapter 6** (Evaluation of External Events) and for the purposes of emergency planning in **Chapter 8** (Emergency Planning).

The results of the characterisation investigations can be summarised below:

Airports, Airfields and Air Routes

The characteristics of air transport infrastructure in the site region have been determined and characterised. Key characteristics that are important to nuclear installation safety are the following:

- The Chief David Stuurman International Airport (CDSIA) (85 km east-northeast) has two asphalt runways, runway 08/26 measuring 1 980 x 46 m and runway 17/35 measuring 1 667 x 46 m, an additional runway is available 10/28, measuring 1 160 x 18 m. The largest aircraft the runways are designed to accommodate is a Type E aircraft (wingspan less than 64 m), but the airport is predominantly used by Type C aircraft (24 m to 35 m wingspan). The airport can accommodate a maximum of 12 Type C aircraft arriving and departing per hour. CDSIA has the capacity to handle 2 million passengers per year. Passenger and aircraft movements have been determined and are currently showing an upward trend, following on a significant decline in the Covid 19 pandemic. There are currently no plans to expand the airport.
- One active civil airfield is located within the site vicinity, St. Francis Airfield (10.8 km E) of the site. The airfield has one grass runway 10/28, measuring 1 000 x 12 m. It operates 24 hours a day and has no control tower but has landing lights. There are 20 hangers for storage and maintenance of small private planes. No aviation fuel or other hazardous chemicals are stored on this site. The airfield currently handles 20 to 35 movements a month. No aircraft accidents have occurred at the airfield in the past 10 years.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-4

Road Transport

The characteristics of road transport infrastructure in the site region have been determined and characterised. Existing roads within the site region include:

- the N2 Freeway, R102 a paved local rural access road;
- the R62 a paved regional distributor;
- the R330 regional link, linking Hankey, Humansdorp and Cape St. Francis;
- the R332 an unsurfaced rural access road linking to the R330; and
- the R331 a surfaced rural access road linking Hankey and Patensie with the N2.

Currently there is no formalised access to the site. Alternative access routes for both normal and heavy loads were considered. The assessment recommends that the eastern access off the R330 be constructed as a formal paved access, while the western access be constructed as a lower order gravel access with a primary function as an emergency escape route. Suitable routes for abnormal loads were assessed, including a suitable bypass around Humansdorp, with the most practical option being Alternative A, an eastern bypass measuring 850 m.

Providing suitable access to the site has therefore been confirmed for both normal and abnormal loads.

The characteristics that are important for nuclear safety refer to infrastructure that may contain external man-made hazards and infrastructure which is required for emergency evacuation.

Rail Transport

The characteristics of rail transport infrastructure in the site region have been determined and characterised. The investigation concluded that there are no active railway lines in the site region.

Marine Transport

The characteristics of marine-based transport infrastructure in the site region have been determined and characterised. Key characteristics that are important to nuclear installation safety are the following:

- The Port of Gqeberha/Port Elizabeth is located beyond the 80 km zone, and is the commercial harbour closest to the site. The port

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-5

expansion plans for the short, medium and long term are reported on in this Section. A number of port activities will be relocated to the Port of Ngqura, and the Port of Gqeberha/Port Elizabeth is planned to be the (i) premier automotive port; (ii) a multi-purpose terminal; (iii) a marine engineering activity focusing on boat and yacht building and vessel repairs; and (iv) a 'Smart People's Port' focusing on leisure, recreational and tourism activities; and (v) service the motor industry, fishing, recreational and agricultural industries.

- Port St. Francis (13.9 km east) is the nearest harbour to the site and the only harbour within the 80 km zone. It is a small fishing and recreational harbour that is privately owned and managed by the Port St. Francis Harbour Association channel 10 on VHF radio. The port is a working harbour and is home to a large fleet of squid, hake and pilchard vessels. The harbour consists of a breakwater with an inside basin for commercial fishing vessels, with mooring at cement jetties and a section (within the harbour) with a slipway facility for small recreational vessels. The harbour allows for a maximum vessel size of 65 ft (approximately 20 m) and allows 80 ft (approximately 25 m) for catamaran vessels, with a draft of no more than 3 m. There are currently no plans to expand the port.

Redacted

Industrial Facilities and Activities

The characteristics of nearby industrial areas and activities in the site region have been determined. Key characteristics that are important to nuclear installation safety are the following:

- Industrial development occurs throughout the site region with the closest industrial areas located in St. Francis Bay (11.36 km east), Jeffreys Bay (24.53 km northeast) and Humansdorp (19.61 km north-northeast).
- Future proposed industrial development is planned to occur at Humansdorp, as well as a proposed industrial corridor between Humansdorp and Jeffreys Bay, as well as at St. Francis Bay.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-6

Emergency Services and Other Civil Infrastructure

Emergency services in the site region were identified as potential support services in the case of a radiological incident or accident. Their roles and duties are defined in terms of the detailed emergency plan prior to the nuclear installation operation. The location and distribution of emergency support services and the associated staff numbers and emergency support infrastructure have been determined for the purpose of informing **Chapter 8** (Emergency Planning).

Storage and Transportation of Hazardous Substances

The evaluation of the storage of hazardous substances within the site vicinity considered industrial areas, the potential for new industrial development, scattered industries, solid waste disposal sites, service stations and fertilizer used on farms. Based on the evaluation, an inventory of hazardous material stored in the site vicinity was compiled.

The evaluation of hazardous substances transported in the site vicinity considered all modes of transport, i.e. by road, rail, sea and air. Based on historical and recorded data, volumes and frequencies have been estimated to compile an inventory of hazardous materials that are currently transported in the site vicinity, as well as hazardous substances that will be transported to and from the site in the future.

The evaluation of potential sources of external human-induced events also considered hazardous substances and bulk chemicals expected to be transported to the site. These represent potential sources of external hazards, as the hazard identification is based on the consistent Environmental Impact Assessment (EIA) data set and the Koeberg Nuclear Power Station (KNPS) experience. The final inventory of hazardous materials to be stored or to occur on-site must be finalised prior to nuclear installation construction.

Identification of Sources of Potential External Hazard

The data presented with respect to external hazards in this section of this TSSR also considered the occurrence of related transport accidents and incidents, the occurrence of external fires and potential sources of human-induced electromagnetic interference.

The assessment of nearby transportation, industrial and military facilities and associated activities as potential sources of external human-induced events that may pose a risk to the safety of the nuclear installation(s) was conducted.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-7

Potential stationary and mobile sources of external human induced events were identified, key characteristics recorded and described in terms of distance and direction from the site.

Nuclear Site Safety

The National Nuclear Regulator (NNR) requires the control and/or monitoring of development within the Emergency Planning (EP) zones surrounding the nuclear installation(s). This is to ensure that no change of land use occurs within these EP zones which may give rise to activities that may pose an external threat to the nuclear installation(s) (e.g. a restriction on the location of hazardous industries or other activities that may have a detrimental impact on emergency planning).

The transport impact assessment considered the evacuation timeframe estimates. Taking the recommended road infrastructure improvement into account the modelling indicates that the 2036 population of 14 101 (estimated to require approximately 3 505 vehicles) could be evacuated from the 16 km zone within a period of 2.5 hours.

Uncertainties

Uncertainties have been determined and the management of uncertainties are addressed.

Conclusions

The main conclusions to be drawn from this investigation are:

- The characteristics of nearby transportation, industrial, civil and military facilities in the region of application have been identified.
- Current and expected future distribution of nearby transportation, industrial, civil and military facilities in the region of application have been determined.
- The storage and transportation of hazardous substances in the region of application have been identified.
- The potential sources of external hazards that may pose a risk to nuclear installation safety have been determined, including relevant stationary and mobile sources.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-8

- The studies have been conducted to an adequate level of detail for the purpose of **Chapter 6** (Evaluation of External Events).
- The studies have been conducted to an adequate level of detail for the purpose of **Chapter 8** (Emergency Planning).
- Appropriate monitoring programmes and controls, which include regular revision of this section of this SSR, to provide on-going assurance regarding the viability of the site over its lifecycle can be established in compliance with regulatory requirements.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-9

CONTENTS

EXECUTIVE SUMMARY	5.7-3
5.7 NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES	5.7-15
5.7.1 Introduction	5.7-15
5.7.2 Purpose and Scope.....	5.7-15
5.7.3 Regulatory Framework.....	5.7-17
5.7.4 Approach to the Characterisation of Nearby Transportation, Industrial and Military Facilities.....	5.7-27
5.7.5 Air Transportation Network and Associated Infrastructure.....	5.7-39
5.7.6 Road Transportation Network and Associated Infrastructure.....	5.7-62
5.7.7 Rail Transportation Network and Associated Infrastructure	5.7-73
5.7.8 Marine Transportation Network and Associated Infrastructure	5.7-76
5.7.9 Industrial Development	5.7-94
5.7.10 Power Stations, Power-generating Installations and Transmission Lines.....	5.7-109
5.7.11 Civil Services and Associated Infrastructure.....	5.7-112
5.7.12 Military Facilities and Activities	5.7-120
5.7.13 Storage of Hazardous Substances within the Site Vicinity.....	5.7-122
5.7.14 Hazardous Substances Transported in the Site Vicinity	5.7-127
5.7.15 Main Activities Relevant to Nuclear Installation Safety	5.7-134
5.7.16 Main Activities Related to Storage and Transportation of Hazardous Substances Relevant to Nuclear Installation Safety.....	5.7-152
5.7.17 Considerations Important to Emergency Planning.....	5.7-154
5.7.18 Management of Uncertainties	5.7-160
5.7.19 Monitoring	5.7-161

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-10

5.7.20 Management System	5.7-163
5.7.21 Conclusions	5.7-167
5.7.22 References	5.7-169

TABLES

Table 5.7.1 Structure of this Site Safety Report	5.7-35
Table 5.7.2 CDSIA: International, Regional, Domestic and Non-scheduled Passenger Departures (January 2018 to December 2023)	5.7-45
Table 5.7.3 CDSIA: International, Regional, Domestic and Non-scheduled Passenger Arrivals (January 2018 to December 2023)	5.7-46
Table 5.7.4 CDSIA: Air Traffic Movements: Departures (January 2018 to December 2023)	5.7-47
Table 5.7.5 CDSIA: Air Traffic Movements: Arrivals (January 2018 to December 2023)	5.7-48
Table 5.7.6 CDSIA: Percentage of Aircraft Types moving East and West of CDSIA (January 2009 to April 2024)	5.7-50
Table 5.7.7 Percentage Light, Medium and Heavy Aircraft moving within the 80 km radius (January 2009 to April 2024)	5.7-51
Table 5.7.8 Traffic Volumes on the N2 as measured at the Humansdorp Interchange ...	5.7-64
Table 5.7.9 Peak a.m. (07:30 to 08:30) and p.m. (16:30 to 17:30) Traffic Volumes (Vehicles) (2024)	5.7-66
Table 5.7.10 Port of Elizabeth Capacity	5.7-80
Table 5.7.11 Port of Port Elizabeth: Vessel Limitations	5.7-80
Table 5.7.12 Port of Port Elizabeth: Summary of Cargo Handled (January to December 2023)	5.7-81
Table 5.7.13 Port of Port Elizabeth: Summary of Containers Handled (January to December 2023)	5.7-82
Table 5.7.14 Port of Port Elizabeth: Vessel Statistics (2023)	5.7-83
Table 5.7.15 Vessel Movements Past the Cape of Good Hope (2015 to 2020)	5.7-89
Table 5.7.16 Sarah Baartman District Municipality Gross Value Add by Industry	5.7-100

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-11

Table 5.7.17 Mines within the Site Vicinity (2022/2023)	5.7-105
Table 5.7.18 Water Treatment Works in the Site Region	5.7-114
Table 5.7.19 Wastewater Treatment Works in the Site Region	5.7-116
Table 5.7.20 Telephone Exchanges (2008)	5.7-117
Table 5.7.21 Microwave Towers (2008)	5.7-117
Table 5.7.22 Radio Towers (2008)	5.7-118
Table 5.7.23 Street Cabinets (2008)	5.7-118
Table 5.7.24 Cellular Base Stations (2008)	5.7-119
Table 5.7.25 Summary of Hazardous Materials Stored within the Site Vicinity (2024) ..	5.7-125
Table 5.7.26 Bulk Chemicals Expected to be Stored at the Site	5.7-126
Table 5.7.27 Vessel Types and Typical Fuel Volumes Carried	5.7-130
Table 5.7.28 Summary of Hazardous Materials Transported past the Thyspunt Site (2024)	5.7-133
Table 5.7.29 Estimated Road Transport Frequencies of Hazardous Chemicals to Thyspunt	5.7-134
Table 5.7.30 Accident Data Recorded for the 35 km Radius around the Thyspunt Site (November 2006 to June 2008)	5.7-137
Table 5.7.31 Extensive External vegetation Fires in the Site Vicinity (January 2018 to March 2023	5.7-143
Table 5.7.32 Sources of Electromagnetic Interference	5.7-148
Table 5.7.33 Police Stations (2024)	5.7-155
Table 5.7.34 Hospitals in the Site Region (2024)	5.7-157
Table 5.7.35 Emergency Services in the Site Region (50 km)	5.7-158
Table 5.7.36 Summary of Activities, Links and Quality Requirements	5.7-165
Table 5.7.37 Regulatory Compliance Matrix	5.7-166

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-12

FIGURES

Figure 5.7.1 Illustration of Terms: Segment, Sector and Annulus.....	5.7-39
Figure 5.7.2 Aerial Photograph of CDSIA.....	5.7-41
Figure 5.7.3 Spatial Arrangements of the CDSIA.....	5.7-42
Figure 5.7.4 CDSIA Standard Arrival and Departure Routes.....	5.7-55
Figure 5.7.5 Location of the Site relative to the Nearest Flight Routes and CDSIA Terminal Control Areas	5.7-56
Figure 5.7.6 CDSIA Master Plan.....	5.7-58
Figure 5.7.7 Proposed Landside Development Opportunities	5.7-58
Figure 5.7.8 Passenger and Aircraft Movement Forecasts.....	5.7-59
Figure 5.7.9 Port of Port Elizabeth: Layout and Facilities	5.7-78
Figure 5.7.10 Public Launch Sites in the Site Region (80 km).....	5.7-86
Figure 5.7.11 Shipping Lanes and Separation Schemes.....	5.7-87
Figure 5.7.12 Port of Port Elizabeth: Current	5.7-91
Figure 5.7.13 Port of Port Elizabeth: Short Term Plan.....	5.7-92
Figure 5.7.14 Port of Port Elizabeth: Medium Term Plan	5.7-93
Figure 5.7.15 Port of Port Elizabeth: Long Term Plan	5.7-94
Figure 5.7.16 South Africa and Eastern Cape Economic Outlook (IMF Projections)	5.7-96
Figure 5.7.17 Gross Domestic Product Trends (2011 to 2021) (Figures in Billions)	5.7-97
Figure 5.7.18 Gross Domestic Product for the Sarah Baartman District Municipality	5.7-97
Figure 5.7.19 Eastern Cape Gross Value Add by Industry	5.7-98
Figure 5.7.20 Operational Coal Burning Facilities and Mines in the Site Vicinity (2023).....	5.7-104
Figure 5.7.21 Estimated Sectoral Employment Figures per settlement in the Site Region (2023)	5.7-107
Figure 5.7.22 Wind Farms and Transmission Lines in the Site Vicinity	5.7-111

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-13

Figure 5.7.23 Extract of Transnet National Pipeline Network 5.7-132

Figure 5.7.24 Marine vessels involved in Shipping Incidents for the Period 1998 to 2011.. 5.7-139

Figure 5.7.25 Oil Spill Contingency Plan No. 10 Diaz Zone Relative to the 80 km radius... 5.7-142

Figure 5.7.26 Fire Incidence within the Site Vicinity (2014 to 2024) 5.7-145

Figure 5.7.27 Fire Incidence within 2 km of the Owner-controlled Boundary (2014 to 2024)
5.7-146

DRAWINGS

Drawing 5.7.1 Area of Investigation: Site Vicinity (16 km) and Site Region (50 km) 5.7-31

Drawing 5.7.2 Air Transportation (80 km)..... 5.7-61

Drawing 5.7.3 Road Transportation (50 km) 5.7-68

Drawing 5.7.4 Future Road and Rail Transportation (50 km) 5.7-75

Drawing 5.7.5 Shipping Lanes relative to the Site (80 km) 5.7-90

Drawing 5.7.6 Industrial Areas (35 km) 5.7-108

Drawing 5.7.7 Urban Infrastructure (35 km) 5.7-121

Drawing 5.7.8 Stationary Hazard Source Map (16 km) 5.7-150

Drawing 5.7.9 Summary Hazard Source Map (16 km) 5.7-150

Drawing 5.7.10 Emergency Services (50 km) 5.7-159

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-14

APPENDICES

Appendix 5.7.A: Fertilizer Delivered and / or stored on Farms in the Site Vicinity (2024)	5.7-176
Appendix 5.7.B: Aircraft Data for CDSIA	5.7-178
Appendix 5.7.C: Eskom EIA Data Set for Expected Inventory of Hazardous Substances Stored at the Thybspunt Site (2008)	5.7-188
Appendix 5.7.D: Aircraft Incidents and Accidents withing the Site Region	5.7-192
Appendix 5.7.E: Shipping Incidents and Accidents within and near the Site Region (2007 to February 2024)	5.7-196

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-15

5.7 NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES

5.7.1 Introduction

This report is an update of the Thyspunt Site Safety Report (TSSR) **Section 5.7** (Nearby Transportation, Industrial and Military Facilities), Rev 0 (Eskom, 2015a) and Rev 0a (Eskom, 2024). This section of the TSSR presents the approach and results of the investigation and characterisation of nearby transportation, industrial and military facilities and associated activities in the Thyspunt site (hereinafter referred to as ‘the site’) vicinity and the site region. Refer to **Chapter 3** (Overview of Planned Activities at the Site) for a description of the nuclear installation(s) enveloping footprint and the site and to **Drawing 5.7.1**, which illustrates the two investigation areas: the site vicinity (16 km) and the site region (50 km).

The report considers the aspects of nearby transportation, military and industrial facilities that form the basis for the identification of human-induced events that need to be considered in the evaluation of external human-induced events (International Atomic Energy Agency, 2023), which are set out in detail in **Chapter 6** (Evaluation of External Events).

The report also addresses aspects that need to be considered in emergency planning, which is discussed in **Chapter 8** (Emergency Planning).

The investigations and descriptions presented provide an input into the assessment of the suitability of the site for the development of nuclear installation(s), which is set out in detail in **Chapter 6** and **Chapter 8**.

This section complements the description of the site characteristics related to demography, land and water use, adjacent sea use and water supply ((presented in **Section 5.4** (Demography), **Section 5.5** (Land and Water Use), **Section 5.6** (Adjacent Sea Use) and **Section 5.12** (Water Supply)).

5.7.2 Purpose and Scope

The purpose of this section is to present the results of the characterisation of nearby transportation, industrial and military facilities,

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-16

which identified the potential stationary and mobile sources of human-induced events that could impact on the nuclear installation(s) and related site characteristics that could influence the implementation of an emergency plan. The investigation also identified infrastructure and services that are required for emergency planning. The regional investigation covered the following:

- present and future characteristics of nearby transportation, industrial, civil and military facilities;
- external human-induced events¹ that are potential sources of external events that may pose a risk to the nuclear installation(s) and need to be considered in the design and operation of the nuclear installation(s) (to provide input into **Chapter 6**);
- present and future facilities and infrastructure that may affect the feasibility of emergency planning or be required for emergency planning (to provide input into **Chapter 8**);

The scope of the present and future site characterisation over the design life of the nuclear installation(s) covered the following:

- activities and facilities in the site vicinity that involve the storage and transportation of hazardous substances, in terms of the dispersion of asphyxiant, toxic, corrosive or radioactive materials, as well as in terms of deflagration, detonation, flammable and explosive hazards, which if released under normal or accidental conditions, could jeopardise the safety of the nuclear installation(s);
- investigation of facilities that may give rise to missiles of any type that could affect the safety of the nuclear installation(s);
- external fires;
- the potential for aircraft crashes on the site, with account taken, to the extent practicable, of characteristics of future air traffic and aircraft movements.

¹ External events are defined as "events originating outside the nuclear installation(s), including natural and man-made events with the potential to cause adverse conditions or even damage to safety important structures, systems or components" (National Nuclear Regulator, 2014).

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-17

5.7.3 Regulatory Framework

The legal and regulatory basis that guides the compilation of this TSSR is outlined in **Chapter 2** (Legal and Regulatory Basis). The current national normative acts and associated regulations specifically relevant to aspects of nearby transportation, industrial and military facilities are set out below, followed by a discussion of relevant international standards and guidelines.

5.7.3.1 Legal Requirements

The national regulations relevant to this section are The Regulations on Licensing of Sites for New Nuclear Installations, R927 (Department of Energy, 2011), which require *inter alia*:

“4. Factors to be considered in evaluating an application for a nuclear installation site licence will include, but not be limited to –

- (1) Factors relating to all nuclear installations in the vicinity.*
- (5) Natural phenomena and potential man-made hazards must be appropriately accounted for in the design of the new nuclear installation(s), and that adequate emergency plans and nuclear security measures can be developed.”*

“5. A Site Safety Report referred to in Regulation 3(2)(a) must contain the following –

- (3) The characteristics of the site relevant to the design assessment, risk and dose calculations, including inter alia:*
 - (a) external events;*
 - (f) projections of the above data commensurate with the design life of the nuclear installation(s).”*

5.7.3.2 Requirements, Documents and Guidelines

In addition to the abovementioned national regulations, international safety standards and recommendations were also considered to ensure that this section is developed in accordance with international best practice and included the following:

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-18

- National Nuclear Regulator (NNR), RG-0019: Interim Guidance on Safety Assessment of Nuclear Facilities (National Nuclear Regulator, 2019) which requires, *inter alia*, Section 7.3.6.1 “*The description of the nuclear facility, site and environs should include all factors relevant to the safety case, including location and factors relevant to external hazards, security risks and public risk including geography, meteorology, hydrology, land use, demographics (present and projected), other industrial undertakings, transport systems and military installations*”.
- NNR Regulatory Guide: Interim Guidance for the Siting of Nuclear Facilities, RG-0011 (National Nuclear Regulator, 2016), which requires *inter alia*:
 - Section 7.1(4): The foreseeable significant changes in land use, such as the expansion of existing facilities and human-induced activities or the construction of high-risk installations, should be considered and approved regional plans must be taken into consideration.
 - Section 7.3.1: To inform the projected annual frequency of aircraft crashes on the site, data such as the distance of the nearest airport (with the present flight frequency and expected growth) and air traffic corridors in the region, as well as the type of aircraft used, should be collected.
 - Sections 7.3.2 and 7.3.3: Data should be collected on external fires, explosions and asphyxiant/corrosive/toxic gas releases, release of radioactive materials, oil slick/chemical spill, blasting operations and mining, drilling and water extraction.
 - Sections 9.1(4), 9.2 and 9.3: To inform emergency planning, data on the characteristics of local transport and communications networks and industrial facilities, which may entail potentially hazardous activities, need to be presented.
- National Nuclear Regulator Position Paper: Considerations of External Events for New Nuclear Installations, PP-0014 (National Nuclear Regulator, 2014), which requires *inter alia*:
 - Section 6: The identification and evaluation of external human-induced events of accidental origin, not directly involved

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-19

in the operational states of the nuclear installation(s) – Examples include *inter alia*: mining-induced seismicity, aircraft crashes, explosions, release of hazardous gases from off-site and on-site storage, release of radioactive material from off-site sources, release of corrosive gases and liquids from off-site and on-site storage, external fires, collision of ships or floating debris with accessible safety related structures, such as water intakes, and collision of vehicles at the site.

- Section 7: The identification and investigation of hazards associated with each external event to a sufficient level of detail by conducting site-specific and regional studies.
- Section 11.7: Data on aircraft movements to feed into an assessment of the effects on the nuclear installation(s) of the impact of a large commercial or military aircraft.
- International Atomic Energy Association (IAEA) Safety Standards No. SSR-1 on Site Evaluation for Nuclear Installations (International Atomic Energy Agency, 2019). This establishes requirements for:
 - Paragraph 1.4(b), *“Evaluating a site such that the site-specific hazards and the safety related site characteristics are adequately taken into account, in order to derive appropriate site-specific design parameters”* Noting that in terms of the standard, *“Site specific design parameters are needed for the design of a nuclear installation. The design of a nuclear installation is adequate for a specific site if the actual parameters used in the design envelop the corresponding site-specific design parameters”*.
 - Paragraph 1.5(a), *“the requirements are to be applied to identify the ... human induced external hazards that could affect the safety of the nuclear installation”*;

and requires *inter alia*:

- Paragraph 4.6(a), the assessment of the suitability of a site for a nuclear installation shall evaluate of *“the effects of ... and human-induced external events occurring in the region that might affect the site”*;

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-20

- Paragraph 4.12, the *“human activities in the region with the potential to induce hazards at the site that might affect the safety of the nuclear installation shall be identified and evaluated. The extent of this evaluation shall be commensurate with the safety significance of the potential hazards at the site”*.
- Paragraph 4.14, *“The size of the region to be investigated shall be defined for each of the ... human-induced external hazards. Both the magnitude of the hazard and the distance from the source of the hazard to the site shall be considered in determining the size of the region to be investigated”*.
- Paragraph 4.16, *“The process and associated criteria used in the screening of site-specific hazards shall comply with the safety objective for site evaluation and shall be properly justified and documented”*.
- Paragraph 4.20, *“The site evaluation for a nuclear installation shall consider the frequency and severity of natural and human-induced external events, ...”*.
- Paragraph 4.26, *“The results of the evaluation of hazards shall be expressed in terms that can be used as an input for deriving the site-specific design parameters; that is, appropriate parameters for describing the severity of the effects of the hazards shall be selected or developed”*.
- Paragraphs 4.27, *“The potential for explosion, chemical releases and/or thermal releases that might affect the safety of the nuclear installation or the dispersion of radioactive material shall be considered in the site evaluation process”*.
- Paragraph 4.32, *“The potential for hazards originating from one nuclear installation to affect other nuclear installations located on the same site or on adjacent sites shall be assessed”*.
- Paragraph 4.34, *“The site characteristics ... and human induced external hazards that can change over time and which could affect the safety of a nuclear installation shall be identified. The potential consequences of such changes shall be duly assessed for the planned lifetime of the nuclear installation”*.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-21

In terms of Requirement 24: Evaluation of hazards associated with human-induced events:

- Paragraph 5.33, *“Human-induced events to be addressed shall include, but shall not be limited to:*
 - (a) events associated with nearby land, river, sea or air transport (e.g. collisions and explosions);*
 - (b) fire, explosions, missile generation and releases of hazardous gases from industrial facilities near the site;*
 - I electromagnetic interference”.*
- Paragraph 5.35, *“The potential for accidental aircraft crashes on the site shall be assessed with account taken, to the extent practicable, of potential changes in future air traffic and aircraft characteristics”.*
- Paragraph 5.36, *“Current or foreseeable activities in the region surrounding the site that involve the handling, processing, transport and/or storage of chemicals having a potential for explosions or for producing gas clouds capable of deflagration or detonation shall be addressed”.*

With respect to monitoring and periodic review:

- Paragraph 7.4, *“As part of periodic safety review (or as part of safety assessments conducted under alternative arrangements), natural and human-induced external hazards and site conditions shall be reviewed throughout the lifetime of the nuclear installation using updated information. Such reviews shall be undertaken at regular intervals (typically no less than once in ten years)”*, as well as under specified circumstances set out further in the standard.
- IAEA Safety Standards Series, Safety Guide: No. SSG-79: Hazards Associated with Human Induced External Events in Site Evaluation for Nuclear Installations (International Atomic Energy Agency, 2023), which provides recommendations on the evaluation of hazards associated with human-induced external events that could affect the safety of nuclear installations. These human-induced events need to be considered in the evaluation of sites for nuclear installations. The

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-22

guide provides for *inter alia*:

- Paragraph 1.12: The safety guide is primarily focused on the evaluation of the site for new nuclear installations, but the recommendations are also applicable in the re-evaluation of sites of existing nuclear installations, and the periodic reviews of such installations.
- Paragraph 1.14: The external human-induced events considered in the Safety Guide are of accidental origin.
- Paragraphs 2.5 and 3.1: The evaluation of other nuclear facilities located at the same site.
- Paragraphs 2.11: The evaluation of possible regional development over the anticipated lifetime of the nuclear installation(s).

In particular, this guide classifies sources of external human-induced events as follows:

- Paragraph 2.15(a): Stationary sources, for which the location of the initiating mechanism is fixed (explosion centre, point of release of flammable or toxic gases), such as chemical plants, oil refineries, storage depots and other nuclear facilities on the same site.
- Paragraph 2.15(b): Mobile sources, for which the location of the initiating mechanism is not totally constrained, such as any means of transportation of hazardous materials or potential projectiles (by road, rail, air, waterways, pipelines). In such a case, an accidental explosion or a release of hazardous material may occur anywhere along a route or pipeline.

The appendix to IAEA SSG-79 provides information on categories of human-induced external events, information on their identification, evolution and possible effects and the potential impact on nuclear installations.

- IAEA Safety Standards Series, Safety Guide: No. NS-G-3.2: Dispersion of Radioactive Material in Air and Water and Consideration of Population Distribution in Site Evaluation for

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-23

Nuclear Power Plants (International Atomic Energy Agency, 2002b), which includes Paragraph 6.3, which requires that important site related factors that need to be taken into account in demonstrating the feasibility of the emergency plan include:

- *“characteristics of local transport and communication networks”;*
- *“industrial facilities that may entail potentially hazardous activities”;*
- *“possible concurrent external events”.*
- IAEA Safety Standards Series, Safety Guide: No. SSG-68: Design of Nuclear Power Installations against External Events excluding Earthquakes (International Atomic Energy Agency, 2021), which includes items of particular relevance to the evaluation of external events relative to the design and safety assessment of the nuclear installation(s). The guidance provided is of particular importance to the evaluations conducted for the purposes of **Chapter 6** of the TSSR.

In addition, relevant sections of the following guides and codes have been referred to in the development of this section:

- US NRC Regulatory Guide 1.78: Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release (U.S. Nuclear Regulatory Commission, 2021). This requires the identification of potential hazards (stationary and mobile) that have the potential to result in toxic vapours or gases and their potential for incapacitating nuclear installation control room operators.
- US NRC Regulatory Guide 1.70: Standard Format and Content for Safety Analysis Reports for Nuclear Power Plants (U.S. Nuclear Regulatory Commission, 1978a) requires:
 - Section 2.2.1: *“provide maps showing the location and distance from the nuclear plant of all significant manufacturing plants; chemical plants; refineries; storage facilities; mining and quarrying operations; military bases; missile sites; transportation routes (air, land, and water); transportation*

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-24

facilities (docks, anchorages, airports); oil and gas pipelines, drilling operations, and wells; and underground gas storage facilities. Show any other facilities that, because of the products manufactured, stored, or transported, may require consideration with respect to possible adverse effects on the plant. Also, show any military firing or bombing ranges and any nearby aircraft flight, holding, and landing patterns”.

- Section 2.2.2.1: *“a concise description of each facility, including its primary function and major products and the number of persons employed, should be provided in tabular form”;*
- Section 2.2.2.2: *“description of the products and materials regularly manufactured, stored, used, or transported in the vicinity of the nuclear plant should be provided”;*
- Section 2.2.2.3: *“for pipelines, indicate the pipe size, pipe age, operating pressure, depth of burial, location and type of isolation valves, and the type of gas or liquid presently carried. Indicate whether the pipeline is used for gas storage at higher than normal pressure and discuss the possibility of the pipeline being used in the future to carry a different product than the one presently being carried”;*
- Section 2.2.2.5: *“for airports, provide information on length and orientation of runways, type of aircraft using the facility, the number of operations per annum by aircraft type, and the flying patterns associated with the airport. Plans for future utilization of the airport, including possible construction of new runways, increased traffic, or utilization by larger aircraft, should be provided. In addition, statistics on aircraft accidents should be provided”.*
- Section 2.2.2.6: *“present activities and new types of activities in the vicinity of the nuclear plant that can be reasonably expected based on economic growth projections for the area”.*
- US NRC Regulatory Guide 1.91: Evaluations of Explosions Postulated to Occur on Transportation Routes near Nuclear Power Plants (U.S. Nuclear Regulatory Commission, 2021) requires *inter alia* the identification of events and conditions outside of the nuclear installation(s) that could pose a threat to the safety of the nuclear

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-25

installation(s), including hazardous materials that are transported on nearby transportation routes.

- US NRC Title 10 of the Code of Federal Regulations Chapter I Part 100 on Reactor Site Criteria (U.S. Nuclear Regulatory Commission, 2021) requires:
 - Section 100.21(e): *“potential hazards associated with nearby transportation routes, industrial and military facilities must be evaluated and site characteristics established such that potential hazards from such routes and facilities will pose no undue risk to the type of facility proposed to be located at the site”*;
 - Section 100.21(g): *“physical characteristics unique to the proposed site that could pose a significant impediment to the development of emergency plans must be identified”*.
- US NRC Regulatory Guide 4.7: General Site Suitability Criteria for Nuclear Power Stations (U.S. Nuclear Regulatory Commission, 2024), requires:
 - Section B: *“an examination and evaluation of the site and its vicinity, including the population distribution and transportation routes, should be conducted to determine whether there are any characteristics that would pose a significant impediment to taking protective actions to protect the public in the event of emergency”*;
 - Section B: *“potentially hazardous facilities and activities within 8 km (5 mi) of a proposed site, and major airports within 16 km (10 mi) of a proposed site, should be identified”*;
 - Section B: The identification of *“accidents at nearby industrial facilities such as chemical plants, refineries, mining and quarrying operations, oil or gas wells, or gas and petroleum product storage installations might produce missiles, shock waves, flammable vapor clouds, toxic chemicals, or incendiary fragments”*;
 - Section B: The identification of *“accidents at nearby military facilities, such as munitions storage areas and ordnance test*

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-26

ranges”.

- US NRC NUREG-0800 Standard Review Plan for the review of Safety Analysis Report for Nuclear Power Plants (Sections 2.2.3, 3.5.1.5 and 3.5.1.6) (U.S. Nuclear Regulatory Commission, 2007/2010), which provides criteria for determining whether a more detailed assessment of aircraft incidents and accidents from future airport flight operations is required to be performed in **Chapter 6** of the TSSR or not. This requires:
 - the identification of the locations and separation distances to transportation facilities and routes (including airports, airways, roads, railways, pipelines and navigable bodies of water);
 - the identification of the military and industrial facilities, such as fixed manufacturing, processing, and storage facilities.
- Electric Power Research Institute (EPRI) Siting Guide: Site Selection and Evaluation Criteria for New Nuclear Energy Generation Facilities (Electric Power Research Institute, 2022), which requires:
 - the identification of military bases, oil pipelines, oil or gas wells, oil and gas storage areas, significant manufacturing facilities, chemical facilities, refineries, mining and quarrying operations, dams, land and water transportation routes for hazardous materials and docks and anchorages for hazardous materials ((within 5 miles (8 km) of hazardous facilities and 10 miles (16 km) of major airports)). For the purpose of this section of the TSSR an enveloping approach to external hazard identification has been adopted.
 - the projected future uses and activities with regards to the above facilities.
- United States Department of Energy Technical Standard No. DOE-STD-3014-2006: Accident Analysis for Aircraft Crash into Hazardous Facilities (U.S. Department of Energy, 2006) requires:
 - identification of the location and distance from the site of nearby airports and air routes, as well as a description of each;
 - a list of aircraft types (with their specifications) that use these

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-27

airports and the number of movements per year;

- historical aircraft accident data.

5.7.4 Approach to the Characterisation of Nearby Transportation, Industrial and Military Facilities

On the basis of the regulatory requirements and criteria and supporting guidance presented in **Subsection 5.7.3**, the NSIP04251 Rev. 2 (Eskom, 2023) applicable to this section and the National Nuclear Regulator's Interim Guidance for the Siting of Nuclear Facilities (National Nuclear Regulator, 2016), the approach adopted to the characterisation of nearby transportation, industrial and military facilities involved the following (Eskom, 2023) (National Nuclear Regulator, 2016):

- identification and description of the nearby facilities, activities and external human-induced events that may affect the safety and inform the design of the nuclear installation(s);
- identification and description of foreseeable evolution of facilities and activities in the site region that may have a bearing on safety, such as changes in land use, the expansion of existing facilities and activities or the construction of high-risk facilities;
- development of a human-induced hazards source map and hazards inventories for the nuclear installation(s);
- presentation of parameters for external events to characterise the potential hazards in such a manner that they can be appropriately used in the hazard assessment (to be presented in **Chapter 6**) and in nuclear installation design;
- providing input for the evaluation of the feasibility of the emergency plan (to be presented in **Chapter 8**);
- identification of areas of uncertainties and approaches for their management;
- identification of critical/important features and characteristics, as well as future actions (e.g. additional monitoring and confirmatory studies).

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-28

5.7.4.1 Area of Investigation

The areas selected for the investigation of nearby transportation, industrial and military facilities, as well as selected civil installations, are based on the site region (50 km, unless otherwise specified) and the site vicinity (16 km) as illustrated in **Drawing 5.7.1**. The areas of investigation are aligned with the areas of investigation presented in **Section 5.4**, **Section 5.5** and **Section 5.6**, which also serve as input into the development of **Chapter 6** and **Chapter 8**.

The areas of investigation were selected to ensure that all relevant sources of external hazards in the site region are identified and characterised for the purposes of **Chapter 6** and to provide information required for emergency planning, presented in **Chapter 8**.

a) Area of Investigation for Sources of Human-induced External Hazards

It is recommended in the US NRC Guide 4.7 (U.S. Nuclear Regulatory Commission, 2024) and EPRI (Electric Power Research Institute, 2022), that the area of investigation for certain sources of potentially hazardous facilities and activities shall be within 5 miles (8 km) of a proposed nuclear installation site, and for major airports within 10 miles (16 km) of a proposed site.

For the purposes of the TSSR, an enveloping distance of 16 km was selected for external hazards related to stationary sources and fixed route hazards, i.e. hazardous substances being transported by road, rail or pipeline.

Where a transport corridor such as an air corridor passes through the site region, or a maritime transport corridor passes the site, a larger area of investigation is applied. The closest regional transport originator, e.g. an airport or harbour that is located beyond the 16 km distance, has therefore been included in the evaluation.

In accordance with the general approach adopted for this section, data were collected for the site region and the site vicinity. In principle, the areas of investigation for the purpose of site characterisation for selected topics were the following:

- transportation networks, infrastructure and associated activities in the site region (50 km), which may affect/support emergency

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-29

planning (to be presented in **Chapter 8**);

- military and industrial infrastructure and facilities, which provide input into hazard assessment for the site vicinity (16 km) to be presented in **Chapter 6**) and the potential affected environment for the site region (50 km);
- civil infrastructure (i.e. water treatment works, wastewater treatment works and solid waste sites), which provide input into hazard assessment for the site vicinity (16 km), to be presented in **Chapter 6**) and the potential affected environment for the site region (50 km);
- potential stationary sources of risk for the nuclear installation safety in the site vicinity (16 km), which provide input into hazard assessment (to be presented in **Chapter 6**);
- potential mobile sources of risk for the nuclear installation safety for the site vicinity, which provide input into the assessment (to be presented in **Chapter 6**). The investigation was increased up to the nearest regional airport, harbour, flight corridor and shipping lane to provide information on the nearest potential source of mobile hazard.

b) Area of Investigation to Support Emergency Planning

Emergency services and civil installations, which are important for emergency planning purposes, are investigated for the identified Emergency Planning Zones (National Nuclear Regulator, 2012). Data were collected for the site vicinity and up to the site region for key infrastructural items that support emergency planning such as hospitals, and provincial and municipal disaster management support facilities.

Further, in the absence of country-specific regulation(s), the population density analysis set out in **Section 5.4** is informed by the US NRC Guide 4.7: General Site Suitability Criteria for Nuclear Power Stations (U.S. Nuclear Regulatory Commission, 2024). This guideline document requires that the average population density over a 20 mile (32 km) radius must be evaluated to determine whether the density through the projected lifetime of the nuclear installation(s) exceeds 500 persons per square mile (200 persons per square kilometre) or not. Where densities exceed this threshold value, particular attention to emergency planning measures is required. A corresponding radius of 35 km was selected to

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-30

perform this analysis and is presented in **Section 5.4**. The investigation of civil installations (i.e. telecommunication infrastructure) that may need to be taken into consideration for emergency planning has therefore been performed for an area that extends beyond the site vicinity and up to 35 km.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-32

5.7.4.2 Topics

Sources of hazards can be classified as either stationary² or mobile³. The information presented in this section includes a consideration of and a description of characteristics of the present and expected future facilities, transportation networks, sources of hazards and human-induced risk events (International Atomic Energy Agency, 2023):

a) Stationary Sources

Relevant stationary sources of potential hazards on land and water in the site vicinity were identified and characterised and include the following:

- oil refineries, chemical plants, storage depots, telecommunication networks, mining or quarrying operations, other nuclear facilities, facilities that store or use combustible, corrosive, asphyxiant and toxic materials and high energy rotating equipment; and
- military facilities.

The information necessary for the consideration of the hazards posed by stationary sources covered the types of hazardous material involved and the quantities in storage, in process and in transit; the types of storage conditions and processes; the dimensions of major vessels, stores or other forms of containment; and the location of these forms of containment, if available.

All available information on accidents and incidents was collected. Information on the possibility of interaction between the identified materials in different stores or in process, which may lead to a significantly greater hazard, is presented in **Chapter 6**.

² Sources, for which the location of the initiating mechanism (explosion centre, point of release of explosive or toxic gases) is fixed, such as chemical plants, oil refineries, storage depots and other nuclear facilities at the same site (International Atomic Energy Agency, 2023).

³ Sources, for which the location of the initiating mechanism is not totally constrained, such as any means of transport of hazardous materials or potential projectiles (by road, rail, waterways, air, pipelines). In such cases, an accidental explosion or a release of hazardous material may occur anywhere along a road or other way or pipeline (International Atomic Energy Agency, 2023).

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-33

b) Mobile Sources

Relevant mobile sources of potential hazards on land, water and in the air in the site region, and the site vicinity, were identified and characterised and include the following (International Atomic Energy Agency, 2023) (National Nuclear Regulator, 2016):

- airports, airfields, air routes and associated activities – airport zones, air traffic routes, flight zones and aircraft (military and civil);
- road and rail transport networks and associated activities – road vehicles, railway trains and wagons;
- harbours, shipping lanes and associated activities – ships and shipping lanes; and
- pipelines.

Air traffic: the information collected on air traffic includes the location of airports, airfields and air traffic routes in the site region; the airports' take-off, landing and holding patterns; the types of warning and control devices available; and the types and characteristics of aircraft and their flight frequencies. Information on aircraft accidents for the site region was collected. Information was collected for both civil and military air traffic. Calculated frequencies are presented in **Chapter 6**.

Surface transportation: the information was collected on fixed traffic facilities in the site region, including ports, harbours, canals, dredged channels, railway marshalling yards and busy road junctions and intersections, as well as traffic routes in relation to the site. Information was collected on the characteristics of traffic flows in the site region and site vicinity, such as the nature, type and quantities of material conveyed along a route in a single transport movement; the sizes, numbers and types of the vessels, speeds, control systems and safety devices where available; and accident statistics, including their consequences. Similar information was collected for pipelines on the nature of the substance transported, the pipe diameter, flow capacity, the internal pressure and accident records, including consequences.

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-34

Information on stationary and mobile types of sources in the site vicinity was collected to determine:

- the location of possible sources of external human-induced events associated with transport networks (dealt with in this section);
- the probability of occurrence and the severity of the events (determined in **Chapter 6**).

The data relevant to the site region were therefore collected in a way that supports the characterisation of the site and presents the following:

- the characteristics and understanding of the current nearby transportation networks, industrial and military facilities;
- the extent and nature of the future transportation networks, industrial and/or civil development and military facilities (this information complements **Section 5.4** and **Section 5.5**);
- the characteristics and understanding of mobile and stationary sources of potential external human-induced events in the site region and the site vicinity, which include:
 - the characteristics of transportation networks with reference to air, road, rail and sea traffic, and the relevant frequency of use and of incidents in the site region and site vicinity;
 - the location of possible sources of external human-induced events associated with transport systems in the site vicinity;
 - the characteristics of mobile sources of hazards from surface and air transport with the potential for explosions, fires and the formation of gas and dust clouds in the site vicinity;
 - the characteristics and the location of stationary sources of hazards from industrial plants, storage depots and military facilities, which may arise from the potential for explosions, fires and the formation of gas and dust clouds in the site vicinity;
 - the probability of occurrence and frequency of fires and other events that may contribute to causing fires (aircraft crashes, explosions, etc.) within 2 km of the site (International Atomic Energy Agency, 2023), (National Nuclear Regulator, 2016) – In order to consider the potential of veld fires to spread over a larger area, the area of investigation was extended to include the site

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-35

vicinity (16 km).

- the distance of future and planned activities and facilities from the nuclear installation(s) in the site region.

The scope of the evaluation is summarised in **Table 5.7.1** below.

Table 5.7.1
Structure of this Site Safety Report

Activity/Industry	Site Region (50 km)	Site Vicinity (16 km)
Airport, airfields and air routes	<u>Subsection 5.7.5</u> (80 km)	-
Surface transport (road and railway)	<u>Subsections 5.7.6</u> and <u>5.7.7</u>	-
Water transport	<u>Subsection 5.7.8</u> (80 km)	-
Industrial development	<u>Subsection 5.7.9.1</u> , <u>5.7.9.2</u> , <u>5.7.9.3</u>	<u>Subsection 5.7.9.4</u> , <u>5.7.9.5</u> and <u>5.7.9.6</u> (Scattered industries and Mining Activities)
Electricity generation and distribution	<u>Subsection 5.7.10</u>	<u>Subsection 5.7.10.6</u>
Power supply to the site	-	<u>Subsection 5.7.10.1</u>
Civil and telecommunication infrastructure	<u>Subsections 5.7.11.1</u> , <u>5.7.11.2</u> and <u>5.7.11.3</u> (Water Treatment works, Wastewater Treatment Works, Solid Waste Sites)	<u>Subsection 5.7.12</u> (Telecommunication, 35 km)
Military facilities	<u>Subsection 5.7.13</u>	-
Storage of hazardous substances	-	<u>Subsection 5.7.14</u>
Transportation of	-	<u>Subsection 5.7.15</u>

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-36

Activity/Industry	Site Region (50 km)	Site Vicinity (16 km)
hazardous substances		
Main activities relevant to nuclear installation safety	-	<u>Subsection 5.7.16</u> (stationary and mobile sources)
Identification of sources of potential hazards (stationary and mobile)	<u>Subsection 5.7.17.1</u> (Aircraft and marine accidents)	<u>Subsection 5.7.17.1</u> (Road, rail and maritime accidents, fires, electromagnetic interference, high energy rotating equipment)
Emergency services: police, fire, hospitals, sea rescue, etc.	<u>Subsections 5.7.19</u>	-

5.7.4.3 Data Sources

The evaluation of present and future activities in the site region and site vicinity took into account available historical data, including consideration of the previous TSSR: Rev 0 (2015) (Eskom, 2015a) and TSSR Section 5.7 Rev 0a (Eskom, 2024).

Relevant information was obtained from national and regional databases, maps, published reports, public records, public and private agencies and professionals. Information about the characteristics of the site relies on official sources, and where data deficiencies or a lack of available data were identified, primary research and/or surveys were considered.

A description of data sources is provided in this section, together with a description of the data collection methodology and verification process. Corrections or adjustments made to address any identified gaps or data deficiencies are listed and any uncertainties in data quality are recorded.

The following key sources of information were used:

- aerial photography and South African 1:50 000 scale topo-cadastral sheets;
- world aeronautical charts;

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-37

- South African Naval Charts from the South African Navy Hydrographic Office;
- Geographic Information System (GIS) and cadastral information sources from the Surveyor General;
- government departments and parastatals;
- national acts, e.g. South African Maritime Safety Authority Act, 1998 and South African Civil Aviation Act, 2009;
- existing regional databases e.g. boat launching facilities, cellular networks and emergency services facilities;
- Eskom's nuclear sites investigation reports;
- primary data collection such as traffic counts, industrial use surveys and field checks, municipal records, interviews with participants in a particular industrial sector and telephonic surveys;
- relevant strategic spatial planning reports at a regional and municipal level e.g. Integrated Development Plans and Spatial Development Frameworks (SDFs);
- economic growth and development strategies and water services reports;
- demography and land and water use studies (with reference to **Section 5.4** and **Section 5.5**);
- input and expert judgement of those specialists specifically tasked with conducting risk assessments and evaluation of design basis events, who rely on data presented in this section for the purpose of preparing **Chapter 6** and **Chapter 8**, to ensure that sufficient data are collected and presented.

In the determination of hazards, site-specific data were used (National Nuclear Regulator, 2016).

Each topic described in this section includes a description of data sources used.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-38

5.7.4.4 Presentation of Data

All data and information collected and assessed for the purpose of this section were:

- recorded and presented in tabular format (where appropriate) in terms of distance (km), while the direction is indicated by a compass sector (northeast, south-southeast, etc.) – Measurements were taken from a predefined co-ordinate defined in **Section 5.1** (Geography and Site Location) on the site that sets a constant from which all distances relative to the site are presented in this TSSR. Direction was recorded clockwise starting with north and distance was recorded in ascending order.
- spatially presented in drawings that correspond with the respective areas of investigation of transportation networks and sources of external hazards assessed.

Data were presented in a format that is adequate for the evaluation of potential external events to be conducted in accordance with the requirements of **Chapter 6**.

Data were also recorded in tabular format and provide input into a GIS database developed for the site description.

All distances in the drawings, figures, and tables presented in this section are measured in a straight line from the site co-ordinates below, which represent a point located at a central position on the site:

Redacted

The description of the infrastructure and facilities is provided in terms of segments, sectors and annuli as illustrated in **Figure 5.7.1** for ease of reading of this section. The radial grid does not represent the emergency planning (EP) zone sizes. The site vicinity and site region have been chosen to be large enough to envelop the expected final EP zones and to satisfy the requirements of emergency planning described in **Chapter 8**.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-39

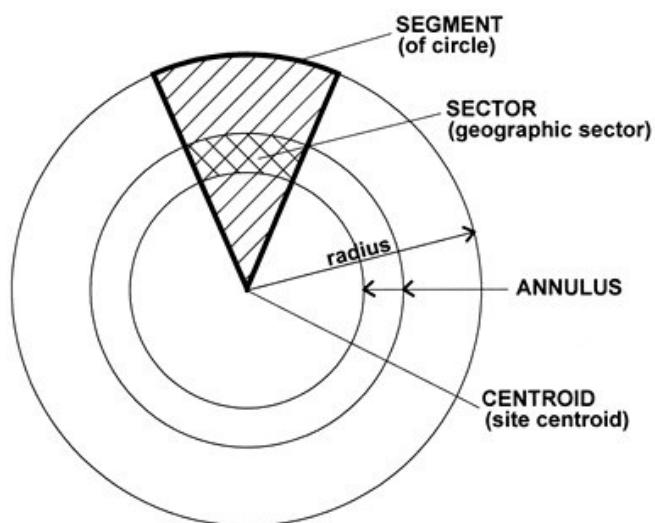


Figure 5.7.1
Illustration of Terms: Segment, Sector and Annulus

The existing facilities and activities and possible future developments in the site region and site vicinity that may have a bearing on nuclear installation safety were considered for the period up to 2096, the planned end of the lifetime of the proposed nuclear installation(s). See also **Chapter 1** (Introduction) and **Chapter 2** (Legal Regulatory Basis).

Assumptions for the future development, in particular industrial development, of the site region were made in accordance with current Spatial Development Frameworks (SDFs) that are described in detail in **Section 5.4** and **Section 5.5**. Land use and activities thereon indicate the potential for stationary sources and the origin of mobile sources of risk. The potential future increase of stationary sources in the site vicinity has been evaluated and is presented in this section.

The characterisation of transportation, industrial and military facilities in and around the site will be reviewed and updated periodically in line with the requirements of the siting regulations (Department of Energy, 2011) and safety re-evaluations/re-assessments during periodic reviews.

5.7.5 Air Transportation Network and Associated Infrastructure

The results of the characterisation and description of the regional air transport network are presented in this section, with the up-to-date description of the current network and associated infrastructure. The

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-40

characteristics that are important for nuclear safety (e.g. potential external hazards) were determined and presented in this subsection. Planned extensions or improvements to the air transportation network were also identified.

The investigation is based on the data presented in the previous TSSR (Eskom, 2015a) and the investigation determined if the data previously provided were still current and valid. Additional and updated data were also obtained where relevant.

5.7.5.1 Commercial Airports

An investigation of airports, airfields and associated air routes was conducted to determine the location, characteristics and current intensity of air transport use in the site region.

There is no commercial airport located within the site region. The nearest commercial airport is the Chief Dawid Stuurman International Airport (CDSIA), (85 km east-northeast of the site), in Gqeberha, which is reported on in this section (see **Drawing 5.7.2**). Limited regional and international flights are conducted by predominantly charter planes.

a) Chief Dawid Stuurman International Airport Capacity and Operations

All international, regional⁴ and domestic flights for the south-eastern region of the country are controlled from CDSIA.

The airport has two asphalt runways, runway 08/26 measuring 1 980 x 46 m and runway 17/35 measuring 1 667 x 46 m. An additional runway is available 10/28, measuring 1 160 x 18 m. The largest aircraft the runways are designed to accommodate is Type E aircraft (wingspan less than 64 m), but the airport is predominantly used by Type C aircraft (24 m to 35 m wingspan). The airport apron can accommodate a maximum of 12 Type C aircraft (Planning Partners, 2024a). CDSIA has the capacity to handle 2 million passengers per year (Planning Partners, 2024a).

b) Spatial Arrangements

The CDSIA features a single airport terminal that handles both domestic and international flights.

⁴ Regional flights represent flights to and from Namibia, Mozambique and Mauritius.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-41

The terminal includes check-in counters, security checkpoints, baggage claim areas and immigration control.

Figure 5.7.2 shows the aerial photograph of the airport and **Figure 5.7.3** shows the spatial arrangements of CDSIA (Planning Partners, 2024a).



Figure 5.7.2
Aerial Photograph of CDSIA

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-42



Figure 5.7.3
Spatial Arrangements of the CDSIA

c) Passenger and Aircraft Movements

Previously, during 2008/2009, the airport handled 1.4 million passengers (Eskom, 2015) and data sourced in 2024 from ACSA shows that in 2023 the airport also handled approximately 1.4 million passengers (1 365 599 passengers) (arrivals and departures). With a capacity of 2 million passengers per year, the airport therefore has 31.7 per cent spare capacity to handle passengers.

Previously, passenger growth over the 2005/2009 period was approximately 8 per cent in overall passenger numbers. Over the period 2008 (1 406 553 passengers) to 2018 (1 608 161 passengers) the airport demonstrated a sustained increase in passenger numbers with an overall increase of 19 per cent over the period.

Current data were obtained from the Airports Company South Africa (ACSA) website for passenger movements for the period January 2018 to December 2023. It is noted that there were no international passenger arrivals or departures recorded during this period.

The data obtained for the period 2018 to 2023 for number of domestic passengers departing from CDSIA for this period is reflected in **Table 5.7.2**, whilst the number of domestic passengers arriving at CDSIA is reflected in **Table 5.7.3**. Overall passenger departure and arrival numbers have decreased between 2018 (approximately 1.7 million passengers) and 2023 (approximately 1.4 million passengers), which

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-43

represents a total decrease of 18.7 per cent.

However, **Table 5.7.2** and **Table 5.7.3** illustrate that passenger numbers increased up to 2019, but that with the advent of the Covid19 pandemic, there was a substantial decrease in passenger numbers, down to just under approximately 640 000 passengers. Thereafter, a steady increase is noted from 2021 to 2022, with the figures for 2023, confirming the upward trend. The airport has yet to recover to pre-pandemic arrivals and departures levels. A year-on-year increase is evident, and by December 2023 passenger numbers for arrivals and departures had more than doubled to approximately 1 365 599 passengers. This number is 21 per cent lower than the peak figure for 2019 of 1 735 654 passengers.

Departure figures reflect zero movements in international and regional passengers between 2018 and 2023, and a 19.0 per cent decrease in domestic and non-scheduled passengers departing at CDSIA over this period. Arrival figures reflected a corresponding decrease in arrivals, i.e. zero movements in international and regional passengers and an 18.4 per cent decrease in domestic and non-scheduled passengers for the same period.

Domestic and non-scheduled passenger numbers however remain consistent throughout the year, which could be attributed to business travel, with higher numbers recorded in September, October and December in 2023.

Data on aircraft movements were obtained from the ACSA website for the period of January 2018 to December 2023, as shown in **Table 5.7.4** and **Table 5.7.5**.

Table 5.7.4 and **Table 5.7.5** also show a decrease in domestic and non-scheduled departure (-18.3 per cent) and arrival (-17.3 per cent) flight movements for the period January 2018 to November 2023. The decrease is not as significant as for passenger numbers and could be ascribed to a larger percentage of smaller aircraft using the airport. The same impact of Covid19 is evident with flight numbers still to recover to the peak of 2019.

The records of ACSA for the period January to December 2023 (one year period) indicated 1 365 599 passengers travelling through CDSIA, of which 682 511 were departures and 683 088 were arrivals (Refer to **Table 5.7.2** and **Table 5.7.3**).

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-44

The records of ACSA for the same period of January to December 2023 (one year period) indicated approximately 38 471 flight movements, of which 18 913 were departures and 19 558 were arrivals (Refer to **Table 5.7.4** and **Table 5.7.5**).

According to ACSA, CDSIA currently handles over 800 t of cargo (Planning Partners, 2024a)

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-45

Table 5.7.2
CDSIA: International, Regional, Domestic and Non-scheduled Passenger Departures (January 2018 to December 2023)

DEPARTURES	INTERNATIONAL AND REGIONAL PASSENGERS							DOMESTIC AND NON-SCHEDULED PASSENGERS						
YEAR / MONTH	2018	2019	2020	2021	2022	2023	Per Cent Increase/ Decrease (2018-2023)	2018	2019	2020	2021	2022	2023	Per Cent Increase/ Decrease (2018-2023)
January	0	0	0	0	0	0	0.0	72 269	71 066	78 915	27 581	45 273	53 157	-26.4
February	0	0	0	0	0	0	0.0	65 102	64 663	66 938	22 231	41 911	47 794	-26.6
March	0	0	0	0	0	0	0.0	73 114	80 431	50 130	33 930	51 481	56 085	-23.3
April	0	0	0	0	0	0	0.0	75 883	76 036	5	41 473	55 128	56 541	-25.5
May	0	0	0	0	0	0	0.0	62 378	63 137	15	37 105	48 359	52 647	-15.6
June	0	0	0	0	0	0	0.0	63 033	68 181	10	28 788	43 787	52 190	-17.2
July	0	0	0	0	0	0	0.0	67 988	68 614	5 626	17 041	47 193	56 070	-17.5
August	0	0	0	0	0	0	0.0	70 428	73 354	12 079	27 967	47 878	57 839	-17.9
September	0	0	0	0	0	0	0.0	73 347	74 257	19 203	36 394	47 122	60 321	-17.8
October	0	0	0	0	0	0	0.0	72 348	76 031	24 761	42 703	50 031	62 739	-13.3
November	0	0	0	0	0	0	0.0	73 860	73 648	30 203	42 524	49 398	59 062	-20.0
December	0	0	0	0	0	0	0.0	72 873	80 101	36 430	43 088	51 638	68 066	-6.6
Total	0	0	0	0	0	0	0.0	842 623	869 519	324 315	400 825	579 199	682 511	-19.0

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-46

Table 5.7.3
CDSIA: International, Regional, Domestic and Non-scheduled Passenger Arrivals (January 2018 to December 2023)

ARRIVALS	INTERNATIONAL AND REGIONAL PASSENGERS							DOMESTIC AND NON-SCHEDULED PASSENGERS						
YEAR / MONTH	2018	2019	2020	2021	2022	2023	Per Cent Increase/ Decrease (2018-2023)	2018	2019	2020	2021	2022	2023	Per Cent Increase/ Decrease (2018-2023)
January	0	0	0	0	0	0	0.0	62 727	60 445	69 116	22 599	35 640	47 441	-24.4
February	0	0	0	0	0	0	0.0	65 741	66 739	67 070	22 206	43 776	49 340	-24.9
March	0	0	0	0	0	0	0.0	73 634	78 890	44 325	35 835	50 641	56 306	-23.5
April	0	0	0	0	0	0	0.0	72 232	74 646	5	40 519	52 315	54 262	-24.9
May	0	0	0	0	0	0	0.0	59 805	58 783	12	35 871	45 856	49 713	-16.9
June	0	0	0	0	0	0	0.0	59 690	66 188	7	28 879	42 530	50 151	-16.0
July	0	0	0	0	0	0	0.0	71 339	72 251	5 714	15 967	48 261	58 445	-18.1
August	0	0	0	0	0	0	0.0	70 681	69 584	11 841	27 786	47 169	55 919	-20.9
September	0	0	0	0	0	0	0.0	71 285	75 148	19 845	36 980	47 311	61 430	-13.8
October	0	0	0	0	0	0	0.0	74 129	78 891	24 875	41 875	50 460	63 872	-13.8
November	0	0	0	0	0	0	0.0	71 373	72 757	30 104	41 616	48 630	58 803	-17.6
December	0	0	0	0	0	0	0.0	84 902	91 813	40 247	49 098	58 036	77 406	-8.8
Total	0	0	0	0	0	0	0.0	837 538	866 135	313 161	399 231	570 625	683 088	-18.4

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-47

Table 5.7.4
CDSIA: Air Traffic Movements: Departures (January 2018 to December 2023)

DEPARTURES	INTERNATIONAL AND REGIONAL MOVEMENTS							DOMESTIC AND NON-SCHEDULED MOVEMENTS						
YEAR / MONTH	2018	2019	2020	2021	2022	2023	Per Cent Increase/ Decrease (2018-2023)	2018	2019	2020	2021	2022	2023	Per Cent Increase/ Decrease (2018-2023)
January	0	0	0	0	0	0	0.0	1 882	1 567	1 714	1 363	1 577	1 183	-37.1
February	0	0	0	0	3	0	0.0	2 092	1 756	1 238	1 326	1 743	1 362	-34.9
March	0	0	0	0	1	0	0.0	2 321	2 070	1 881	1 804	3 610	1 790	-22.9
April	0	0	0	0	0	0	0.0	2 245	2 166	57	1 348	1 677	1 435	-36.1
May	0	0	0	1	0	0	0.0	2 211	2 333	98	1 871	2 269	1 546	-30.1
June	0	0	0	0	0	0	0.0	1 780	2 268	1 544	2 094	1 664	1 533	-13.9
July	0	0	0	0	0	0	0.0	2 043	2 112	1 664	1 586	1 573	1 851	-9.4
August	0	0	0	0	0	0	0.0	1 814	2 036	1 429	1 475	1 581	1 872	3.2
September	0	0	0	0	0	0	0.0	1 764	1 846	1 587	1 206	1 271	1 696	-3.9
October	0	0	0	0	0	0	0.0	1 497	2 012	1 330	1 676	2 059	1 694	13.2
November	0	0	0	1	0	0	0.0	1 728	1 801	1 401	1 561	1 476	1 840	6.5
December	0	0	0	0	0	0	0.0	1 786	1 771	1 091	1 410	1 096	1 111	-37.8
Total	0	0	0	2	4	0	0.0	23 163	23 738	15 034	18 720	21 596	18 913	-18.3

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-48

Table 5.7.5
CDSIA: Air Traffic Movements: Arrivals (January 2018 to December 2023)

ARRIVALS	INTERNATIONAL AND REGIONAL MOVEMENTS							DOMESTIC AND NON-SCHEDULED MOVEMENTS						
YEAR / MONTH	2018	2019	2020	2021	2022	2023	Per Cent Increase/ Decrease (2018-2023)	2018	2019	2020	2021	2022	2023	Per Cent Increase/ Decrease (2018-2023)
January	0	0	0	0	0	0	0.0	1 910	1 603	1 750	1 391	1 643	1 267	-33.7
February	0	0	0	0	0	0	0.0	2 157	1 780	1 812	1 367	1 863	1 450	-32.8
March	0	0	0	0	0	0	0.0	2 376	2 077	1 891	1 858	3 683	1 823	-23.3
April	0	0	0	0	0	0	0.0	2 259	2 164	58	1 408	1 766	1 495	-33.8
May	0	0	0	0	0	0	0.0	2 238	2 365	90	1 992	2 395	1 623	-27.5
June	0	0	0	0	0	0	0.0	1 813	2 298	1 569	2 145	1 786	1 572	-13.3
July	0	0	0	0	0	0	0.0	2 077	2 142	1 700	1 682	1 652	1 897	-8.7
August	0	0	0	0	0	0	0.0	1 870	2 090	1 448	1 505	1 631	1 935	3.5
September	0	0	0	0	0	0	0.0	1 799	1 874	1 607	1 256	1 333	1 735	-3.6
October	0	0	0	0	0	0	0.0	1 539	2 043	1 359	1 739	2 149	1 719	11.7
November	0	0	0	0	0	0	0.0	1 786	1 875	1 444	1 669	1 553	1 897	6.2
December	0	0	0	0	0	0	0.0	1 814	1 827	1 125	1 468	1 196	1 145	-36.9
Total	0	0	0	0	0	0	0.0	23 638	24 138	15 853	19 480	22 650	19 558	-17.3

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-49

d) Aircraft Types

CDSIA can accommodate most types of aircraft, from large passenger jets to smaller private aircraft. The relevant data, indicating average monthly movements per type of aircraft in the 2005 to 2023 period are presented in **Appendix 5.7.A**. Data were sourced from Air Traffic Navigation Services (ATNS) (ATNS, 2024).

The largest aircraft that uses the airport is the Boeing 747-400 passenger plane, with a maximum take-off weight of 396 894 kg (64.44 m wingspan, 70.66 m length and 19.41 m height) and a fuel capacity of 215 991 ℓ. The aircraft has however had no movements at CDSIA in the past 10 years. Only a total of 13 movements were made since 2009 (one movement in 2009 and 12 movements in 2010). This is an average of 0.072 monthly movements recorded (January 2009 to December 2023). This is the largest aircraft the airport can accommodate, since the runway can handle Type E aircraft (52 m to 64 m wingspan).

The Boeing C-17 Globemaster III plane is the largest military aircraft that flies within the airspace surrounding the site, with a take-off weight of 265 350 kg (51.75 m wingspan, 53 m length and 16.79 m height) and a fuel capacity of 82 125 ℓ. The aircraft did not have frequent movements during the period of January 2009 to December 2023. Three flights were recorded since 2009, with all three movements occurring in 2023.

The highest frequency of movements is recorded for the Cessna Aerobat A152, with an average of 489 monthly movements (January 2009 to December 2023) and with a take-off weight of 757 kg (10.16 m wingspan, 7.34 m length and 2.59 m height) and a fuel capacity of 98 ℓ. The Cessna Aerobat A152 is a general aviation airplane that is used primarily for flight training and private use. The most frequent commercial passenger aircraft movements are recorded at the time for:

- the Canadair CL-600 Regional Jet CRJ-200 (take-off weight of 24 041 kg, 21.18 m wingspan, 26.77 m length and 6.30 m height and a fuel capacity of 8 081 ℓ) with an average recorded 116.217 movements/month;
- the Bombardier Q400 (take-off weight of 29 257 kg, 27.4 m wingspan, 25.7 m length and 7.49 m height and a fuel capacity of 6 526 ℓ) with an average recorded 92.228 movements/month.

The most frequent movement by a helicopter is by the Robinson R22 (take-off weight of 621 kg, 7.67 m rotor diameter, 8.74 m length and

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-50

2.72 m height and a fuel capacity of 105 l) with an average recorded 92.5 movements/month.

The airport underwent a major upgrade for the 2010 Soccer World Cup and no additional upgrades are planned for the near future. A possible expansion of the runway was previously considered. This would increase the runway system capacity to 400 000 aircraft movements per year.

The air corridors associated with CDSIA that pass near the site are illustrated in **Drawing 5.7.2**. **Table 5.7.6** shows the percentage of light, medium and heavy aircrafts moving east and west of the CDSIA. The data were captured for the period of January 2009 until April 2024. Of the total movements west of the CDSIA, 91.31 per cent are medium sized aircraft. Of the total movements east of the CDSIA, 62.32 per cent are medium sized aircraft.

Table 5.7.6
CDSIA: Percentage of Aircraft Types moving East and West of CDSIA (January 2009 to April 2024)

Movements West of FAPE (CDSIA)			Movements East of FAPE (CDSIA)		
Corridor Q_UQ49 (FAPE to FACT/FAGG)			FAPE to FAEL		
Weight	Amount	Percentage	Weight	Amount	Percentage
Light	3 805	8.84%	Light	3 705	38.89%
Medium	39 211	91.13%	Medium	5 819	61.09%
Heavy	12	0.03%	Heavy	2	0.02%
Sub-total	43 028	100.00%	Sub-total	9 526	100%
Corridor Q_UQ56 (FACT/FAGG to FAPE)			FAEL to FAPE		
Weight	Amount	Percentage	Weight	Amount	Percentage
Light	3 594	8.48%	Light	3 741	36.52%
Medium	38 763	91.49%	Medium	6 502	63.48%
Heavy	13	0.03%	Heavy	0	0.00%
Sub-total	42 370	100.00%	Sub-total	10 243	100.00%
Total Movements West of FAPE			Total Movements East of FAPE		
Weight	Amount	Percentage	Weight	Amount	Percentage
Light	7 399	8.66%	Light	7 446	37.67%
Medium	77 974	91.31%	Medium	12 321	62.32%
Heavy	25	0.03%	Heavy	2	0.01%

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-51

Total	85 398	100.00%	Total	19 769	100%
-------	--------	---------	-------	--------	------

Table 5.7.7 shows the percentage of light, medium and heavy aircrafts moving within the 80 km radius. These movements were recorded to occur within the site region, but not within the flight corridors and are associated with landing patterns associated with CDSIA and not in air corridors (see **Figure 5.7.4**). The data were captured for the period of January 2009 until April 2024. Of the total aircraft movements recorded, 99.79 per cent were for light aircraft (Planning Partners, 2024a).

Table 5.7.7
Percentage Light, Medium and Heavy Aircraft moving
within the 80 km radius
(January 2009 to April 2024)

Movements within 80 km		
Weight	Amount	Percentage
Light	28 5906	99.79%
Medium	579	0.20%
Heavy	20	0.01%
Total	28 6505	100.00%

5.7.5.2 Airfields

Civil airfields within the 80 km radius are illustrated in **Drawing 5.7.2**. These are predominantly small civil airfields or emergency landing strips located on farms. The emergency landing strips are mostly unregistered facilities used for private purposes, with no supporting facilities. As illustrated in **Drawing 5.7.2**, the following airfields are located within the 80 km radius: St. Francis Airfield (13.4 km east); Humansdorp Airport (18.5 km north-northeast); Paradise Beach Airport (21.2 km east-northeast); Vlakteplaas Airstrip (32.3 km northeast); Beulah Airport (38.5 km north-northeast); Woodlands (57.2 km north-northeast); Seaview Airport (67.7 km east-northeast); Cockscornb (62.8 km north-northeast); Progress (71.9 km northeast); Uitenhage (79.1 km northeast); Kareedouw Airport (44.4 km west-northwest); Regyne Protea Farm (50.5 km west-northwest); and Tsitsikamma Fly-In (39.6 km west-northwest).

The heliports in the 80 km radius are located at Humansdorp Hospital Heliport (17.5 km north-northeast); BJ Voster Hospital (Kareedouw, 46.8 km northwest); and Oubosstrand (51.7 km west-northwest).

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-52

Flying schools are located at the following locations within or close to the area of investigation:

- Progress Flight Academy located at Progress airfield (71.9 km northeast) offering professional flight training. The flight school has Piper Warrior single engine aeroplanes and Piper Seminole multi-engine aeroplanes. The latter are being replaced with Vulcanair P68R multi-engine aeroplanes.
- Algoa Flight Centre, which is located at the CDSIA (85.0 km east-northeast) and offers professional flight training. The flight school has a fleet of Cessna 150s, Cessna 152s, a Cessna C172, a Cessna 172RG, Mooney M20J and a Piper Comanche PA30 (Planning Partners, 2024a).

Registered civil airfields located with the 80 km radius are discussed below.

St. Francis Airfield (13.4 km east)

The St. Francis Airfield (FACF) is located 13.4 km east of the site (see **Drawing 5.7.2**) and is the nearest airfield to the site.

The airfield is a licenced private airfield and has one grass runway 10/28, measuring 1 000 × 12 m. It operates 24 hours a day and has no control tower but has landing lights and 20 hangers for storage and maintenance of small private planes. No aviation fuel is stored on-site.

In 2012 it was reported that the busiest period for the airfield is during the holiday periods (March to April and mid-December to mid-January). The runway is designed to accommodate Learjets, but not commercial airliners.

Based on a survey conducted by Planning Partners in February 2024, it was confirmed that the largest aircraft type the airfield can accommodate weighs less than 5.7 t as defined by the ICAO5 (e.g. Pilatus PC12, Pilatus PC24, Kingair, etc.). Currently the airfield records on average 20 to 35 departures and 20 to 35 arrivals per month. No accidents were reported in the period 2014 to 2024. The airfield hosts an annual fly-in towards the end of December, which is weather dependant, with approximately 1 000 attendees. At present there are no plans for future

⁵ International Civil Aviation Organisation

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-53

extension of the airfield (Planning Partners, 2024a).

Paradise Beach (21.2 km east-northeast)

Data were obtained from the CAA's web-published records of registered airfields. The airfield accommodates light aircraft for local residents and for visitors during holidays, is open to the public and is used for flight training. Based on a survey conducted by Planning Partners in 2024, it is operational throughout the week in daylight hours. It has no control tower or landing lights.

The airfield has one gravel runway 08/26 measuring 1 000 × 16 m. There are currently 23 hangers at the airport. The largest aircraft that can be accommodated at the airport is a PC12/King Air 200 or similar. Average monthly movements are: 100 departures and 100 arrivals. The airport has 34 members. No aviation fuel is stored at the airport and no aircraft accidents have been recorded in the last 10 years.

Emergency services include fire-fighting capabilities, rescue equipment and the ability to remove disabled aircraft (Planning Partners, 2024a).

Progress Airfield (71.9 km northeast)

Data were obtained from the CAA's web-published records of registered airfields. Progress Airfield is a private airfield and prior permission is required for its use and night operations are only permitted with the approval of the operator. It has two runways both of which are grassed (i) runway 07/25 measures 800 × 30 m and (ii) runway 10/28 measures 685 × 20 m. The airfield accommodates the Progress Flight Academy (Planning Partners, 2024a).

5.7.5.3 Military Airfields

There are no military airfields within the site region or the 80 km radius. The closest military air force base is the Air Force Station Port Elizabeth. It is co-located and shares the runways with CDSCIA which is 85 km to the east-northeast of the Thyspunt site. The air force base was downgraded in the early 1990s to an air force station. Main operations at the station include coastal recce flights and command-and-control in crime prevention operations in co-operation with the police and national defence force (Planning Partners, 2024a).

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-54

5.7.5.4 Flight Routes and CDSIA Standard Arrival and Departure Routes

Air routes in the region and the vicinity of the site are depicted in **Drawing 5.7.2**.

ATNS has confirmed that the historic flight routes that were reported on in the previous 2015 TSSR have largely been replaced by new flight routes, which follow new alignments. Aircraft predominantly fly within these new flight routes, but the previous flight routes are still in place. The positions of these flight routes are included in **Drawing 5.7.2**.

Most commercial aircraft passing through the site region arrive at or depart from the CDSIA. With respect to flights in the 80 km radius, flight movements are predominantly to and from the Cape Town International Airport and the George International Airport. Aircraft are directed to use the CDSIA Standard Arrival Routes and Standard Departure Routes when arriving or departing from the airport. However, pilots may request to divert from these standard routes to save flight time and may therefore fly along different flight paths within the site vicinity. These diversions are at the discretion of the airport control tower. **Figure 5.7.4** illustrates the CDSIA Standard Arrival Routes and Standard Departure Routes. As is illustrated, these Standard Arrival Routes and Standard Departure Routes are located within the 80 km radius, but are located beyond the 50 km site region.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-55

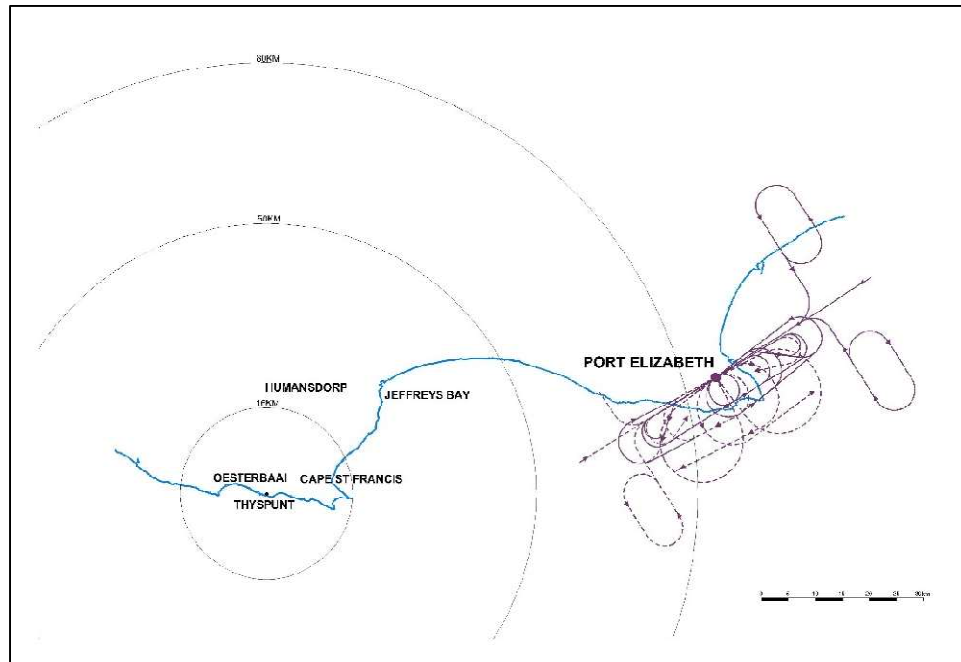


Figure 5.7.4
CDSIA Standard Arrival and Departure Routes

Smaller planes and helicopters that are used for unscheduled flights are generally known to operate down to unregulated, low levels along the coast. No crop spraying was recorded within the site region.

There are two main air routes passing through the 80 km radius (Refer to **Drawing 5.7.2** and **Figure 5.7.5**), namely:

- Q49/UQ49 air route (21.05 km north) that accommodates east to west movements from CDSIA to the Cape Town International Airport and George International Airport – The air route ranges between 20 000 ft (6 096 m) and 24 500 ft (7 468 m) in height. During 2023, a total of 1 922 aircraft movements were recorded within this route, with the largest number of movements being made by the Boeing 737-800 (781 westward movements and a maximum take-off weight of 79 015 kg) and the Embraer E190 (647 westward movements and a maximum take-off weight of 51 800 kg). The largest aircraft using this route was the Boeing 747-400.
- Q56/UQ56 air route (2.41 km south) that accommodates west to east movements from the Cape Town International Airport and George

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-56

International Airport to CDSIA – The air route ranges between 20 000 ft (6 096 m) and 24 500 ft (7 468 m) in height. During 2023, a total of 1 828 aircraft movements were recorded within this route, with the largest number of movements being made by the Boeing 737-800 (770 eastward movements) and the Embraer E190 (650 eastward movements). The largest aircraft using this route was the Boeing 747-400.

Figure 5.7.5 shows the controlled airspace around the CDSIA. The CDSIA is the main centre for air traffic control in the region. The site falls within the DSIA Terminal Control Area. The airspace above this 50 km site region accommodates the following (Also see **Drawing 5.7.2**):

- CDSIA Terminal Control Area D that is a general flying zone located between 6 500 ft (1 981 m) and 14 500 ft (4 420 m) above mean sea level (msl);
- CDSIA Terminal Control Area A that is a general flying zone located between 2 000 ft (610 m) and 14 500 ft (4 420 m) above mean sea level (msl) (Planning Partners, 2024a).

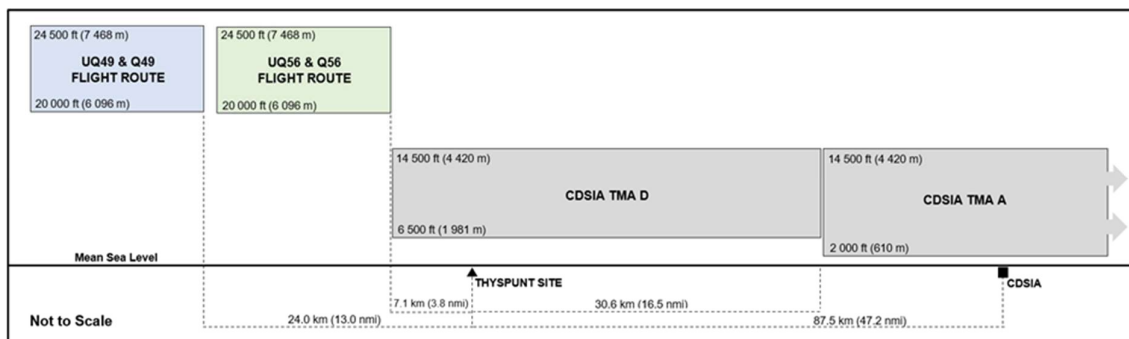


Figure 5.7.5
Location of the Site relative to the Nearest Flight Routes
and CDSIA Terminal Control Areas

5.7.5.5 Drones

In August 2016 a drone crashed onto the Duynefontyn site. Data were therefore collected on drones for the purpose of the update of TSSR Section 5.7.

In 2015 the Minister of Transport signed the eighth amendment of the

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-57

Civil Aviation Regulations, 2011. The amendment which contains Part 101: Remotely Piloted Aircraft Systems came into operation on 1 July 2015.

In terms of the regulations, drones may be utilised for commercial operations; corporate operations; non-profit operations; and private operations. Further, no person shall act as a remote pilot, except when undergoing a skill test or receiving flight instruction, unless he or she is in possession of a valid remote pilot licence in the relevant category. Unless approved by the SACAA, it is not permitted to fly or operate an unmanned aerial system (UAS) or toy aircraft near to, adjacent to or above a nuclear power plant.

In 2022 there were 26 drone license holders, up from 24 registered in 2018 registered with the SACAA and 86 UAS operators.

Notwithstanding, the current low numbers of licenced operators demand for drones is increasing in South Africa over a number of sectors including: agriculture, mining, insurance, construction, conservation and medical services (Planning Partners, 2024g).

5.7.5.6 Future Air Transport and Aircraft Movements

The St. Francis Airfield (the airfield nearest the site) currently has no future expansion plans.

ACSA appointed a service provider to prepare a masterplan and precinct plans for the CDSIA. ACSA has provided high-level data on the future expansion plans to inform the TSSR. The CDSIA master plan (see **Figure 5.7.6**) intends major upgrades in terms of capacity for the airport. According to the master plan, the airport's ultimate capacity aims to accommodate annually 16 to 17 million passengers, 100 000 t of cargo and general aviation.

The CDSIA landside precinct plan also proposes future development for three precincts at the CDSIA (see **Figure 5.7.7**). The first precinct, the 'Northern Precinct', will potentially offer airside access in excess of 100 000 m² with crucial direct airside access. The second precinct, the 'Western Precinct', is planned to accommodate remote car rental facilities. The third precinct, the 'Gateway Precinct', offers 13 000 m² of industrial zoned land with good visibility at the entrance to the airport.

The airport expansion plans rely on the construction of a third landing strip to increase the capacity of the airport.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-58

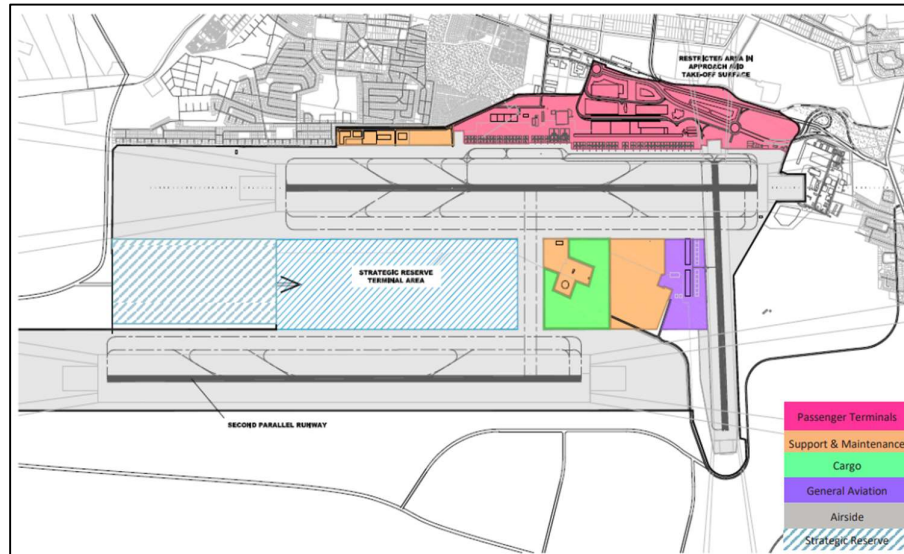


Figure 5.7.6
CDSIA Master Plan



Figure 5.7.7
Proposed Landside Development Opportunities

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-59

An extract from the latest traffic forecast (2022) shows that, in a base case for passengers, the average growth rate projected for 2019 to 2025 is -0.6 per cent, but it is projected to increase to 3.4 per cent for the period 2025 to 2042 (see **Figure 5.7.8**). Thus, the average growth rate projected for 2019 to 2042 is 2.4 per cent. In a high case scenario, the average growth rate projected for 2019 to 2042 is 3.5 per cent and in a low case it is 1.2 per cent. This shows that in any type of scenario, it is projected that the passenger average growth rates will be on the rise in the long-term forecast.

While the passenger forecast shows a general increase in average growth rates, the forecast for aircraft movements shows slightly less growth. The base case scenario projects an average growth rate of 0.5 per cent for the period 2019 to 2025, which increases to 1.3 per cent for the period 2025 to 2042. Thus, the average growth rate projected for 2019 to 2042 is 1.1 per cent. In the high case scenario, the average growth rate projected for 2019 to 2042 is 2.1 per cent, whereas in the low case scenario the average growth rate projected is -0.1 per cent for the same period.

Passengers and PATMs

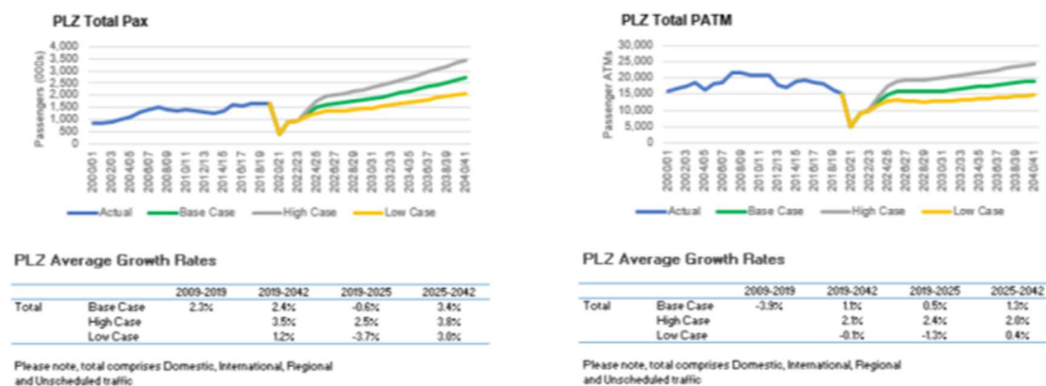


Figure 5.7.8
Passenger and Aircraft Movement Forecasts

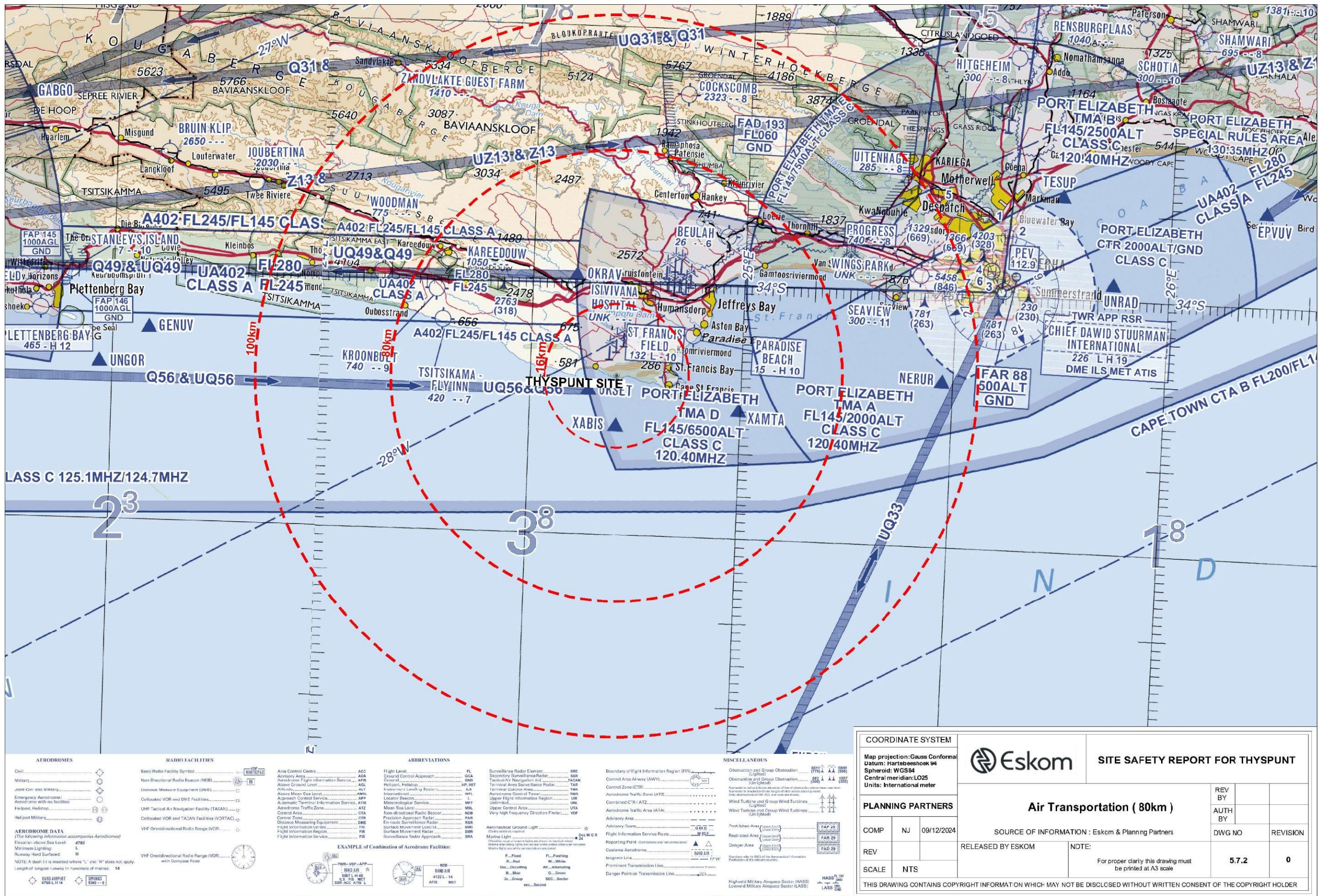
There are two major capital projects for the CDSIA relevant in the coming years. The first project is the expansion of the terminal which will consist of expanding the terminal building to the east and west, including a new 1½ level processing facility. An additional 15 000 m² terminal area will be provided to cater for approximately 1 million additional passengers. The project will cost approximately R1.3 billion. Planning is estimated to be

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-60

completed in late-2025, with the construction then estimated to begin mid-2026 and completion of the project in late-2029.

The second project is the relocation of the fire station. The existing rescue and fire-fighting facilities need to be relocated to make space for ground servicing equipment staging areas that will be displaced by the terminal building expansion project. The relocation project will consist of a new fire station, access road and gate, staff parking, a gymnasium and administration offices. The project is estimated to cost approximately R33 million. Planning is estimated to be completed in mid-2025, with the construction estimated to start in late-2025 with completion in late-2026.

There are currently no known plans to expand either the St. Francis or Paradise Beach Airfields (Planning Partners, 2024a).



 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-62

5.7.6 Road Transportation Network and Associated Infrastructure

The results of the characterisation and description of the regional road transport network are presented in this section, with the up-to-date description of the current network and associated infrastructure. The characteristics that are important for nuclear safety (e.g. potential external hazards) or important for emergency planning were also determined and presented in this subsection. Planned extensions or improvements to the transportation network were identified.

An investigation of the road infrastructure and network within the site region was conducted in 2024 to assess traffic effects on the proposed nuclear site across the construction, operation, and decommissioning phases to analyse the existing road infrastructure and to propose required improvements. The main focus of the study was within the area 50 km from the site, which included the N2 highway, the R102 and the R330. The results of this investigation are presented below with specific focus on the characteristics of the transport network and transport infrastructure that must be considered in order to identify potential sources of mobile hazards (U.S. Nuclear Regulatory Commission, 2007/2010) and to demonstrate the feasibility of the emergency plan (International Atomic Energy Agency, 2002b).

The investigation is based on the data presented in the previous TSSR (Eskom, 2015) and updated with latest data sourced in 2024 (Innovative Transport Solutions, 2024a).

5.7.6.1 Existing Road Network

The main road network within 50 km radius of the site includes the following main road sections as illustrated in **Drawing 5.7.3**:

- the N2 Freeway (Class 1)⁶ is the major road transportation route between the Western Cape and the Eastern Cape and beyond. – It extends up to Thornhill in the east and Woodlands in the west within the site region.

⁶ Class 1 refers to trunk roads (freeways, national, provincial and inter-regional roads).

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-63

- the R102 (Class 1 and 2)⁷ runs parallel to the N2 Freeway between Gqeberha in the east and Tsitsikamma in the west – It extends up to Thornhill in the east and Woodlands in the west within the site region.
- the R62 (Class 1) provides access off the N2 Freeway to the northwest and further to the Langkloof;
- the R330 (Class 2) links St. Francis Bay with Humansdorp, Hankey and Patensie;
- the R332 (Class 2) provides access off the R330 to Andrieskraal;
- the R331 (Class 3) links the R102 to the R332 (through Hankey and Patensie).

The N2 Freeway (21.5 km north of the site) serves as an east-west national road that provides the primary link between Gqeberha and Cape Town. The road has a single carriageway cross-section (one lane per direction), apart from those sections where climbing lanes are provided. According to the transport assessment done for this TSSR (Innovative Transport Solutions, 2024a), the road surface of the N2 is adequate for the current demand and function of the road. The surface is well maintained with no visible cracks. The following four grade-separated interchanges along the N2 Freeway could give access to the site:

- the link to the R102 at Mondplaas;
- the turn-off to Jeffreys Bay;
- the link to R330 north of Humansdorp;
- the link to R62 at Dieprivier, as illustrated in **Drawing 5.7.3**.

5.7.6.2 Traffic Volumes

Traffic volumes along the N2 Freeway were obtained for the period 2021 to 2024 and are presented in **Table 5.7.8** (Innovative Transport Solutions,

⁷ Class 2 refers to primary distributors (urban freeways, urban expressways and major arterials);
Class 3 refers to district distributors (minor arterials and major roads).

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-64

2024a). They demonstrated a steady increase over the period, with a decreasing percentage of trucks observed.

Table 5.7.8
Traffic Volumes on the N2 as measured at the Humansdorp Interchange

Site	Year	AADT ⁸	ADT ⁹	Peak Hour Volume	% Heavy Vehicles
Humansdorp Interchange	2021	3 868	899	534	23%
	2022	3 958	910	467	23%
	2023	4 017	843	382	21%
	2024	4 377	874	337	20%

The R102 (18.1 km north-northeast) is a two-lane surfaced road running more or less parallel to the N2 Freeway as illustrated in **Drawing 5.7.3**. This road was previously the main road that linked Gqeberha and Cape Town, prior to the construction of the N2. Currently, it functions as a local rural access road.

The R62, 17.1 km north (see **Drawing 5.7.3**), is a two-lane surfaced road that provides access to Joubertina through the Langkloof (45 km northwest). Joubertina is located to the northwest outside of the site region. The R62 is classified as a regional distributor, but can also be used as an alternative route to the Western Cape.

The R330, 11.3 km east-northeast (see **Drawing 5.7.3**) serves as a north-south regional link between the towns of Hankey, Humansdorp and Cape St. Francis. It is the main road within the vicinity of the site. It also functions as a local rural access road. The road is in good condition, there are however uneven surfaces at some of the intersections close to Cape St.

⁸ Average Annual Daily Traffic (AADT) is the total traffic volume in a year, including school and public holidays and weekends, divided by 365.

⁹ Average Daily Traffic (ADT) the 24-hour traffic count taken on any typical working weekday in an urban area

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-65

Francis.

The R332 road is an unsurfaced rural access road and connects to the R330 road approximately 6.0 km north of Humansdorp.

The R331 road is a surfaced rural access road that links the towns of Hankey and Patensie with the N2 Freeway (northeast of Jeffreys Bay). No traffic counts have been conducted on this road.

The current available road traffic data on the road network surrounding the site are summarised in **Table 5.7.9**.

Information on traffic accidents on these roads is described in **Subsection 5.7.16.1** and summarised in **Table 5.7.31**.

The 2024 Transport Status Quo, conducted as part of this update of the TSSR (Innovative Transport Solutions, 2024a), determined the peak a.m. and p.m. traffic along the R330, the road nearest to the site and the only road within the site vicinity (see **Drawing 5.7.3**). The results are shown in **Table 5.7.9**.

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-66

Table 5.7.9
Peak a.m. (07:30 to 08:30) and p.m. (16:30 to 17:30) Traffic Volumes (Vehicles) (2024)

Section of R330 Road	Peak a.m. Eastbound	Peak a.m. Westbound	Peak p.m. Eastbound	Peak p.m. Westbound
Park St/ R330/ Saffery Street	426	220	308	263
R102/ Saffery Street	549	354	431	541
R102/ Main Road/ R330	314	419	342	523
N2 on-ramp (East approach)/ R330	0	30	0	27
N2 off-ramp/ R330	69	0	110	0
R102/ Westgate Road/ Koerat Road	139	139	231	81
Section of R330 Road	Peak a.m. Northbound	Peak a.m. Southbound	Peak p.m. Northbound	Peak p.m. Southbound
Main Access Road/ R330	143	130	133	141
R330/ Tarragona Road	178	154	269	164
Access to St. Francis Links/ R330/ St. Francis Bay	232	201	340	119
Access to Oyster Bay (DR1763)/R330	218	337	295	186

5.7.6.3 Public Transportation Network

The public transport services available within the site region are minibus taxis and buses. In general, most of the public transport services are provided as long-distance travel (mostly by buses) and travel within towns (mostly by minibus taxis) (Innovative Transport Solutions, 2024a).

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-67

a) Minibus Taxis

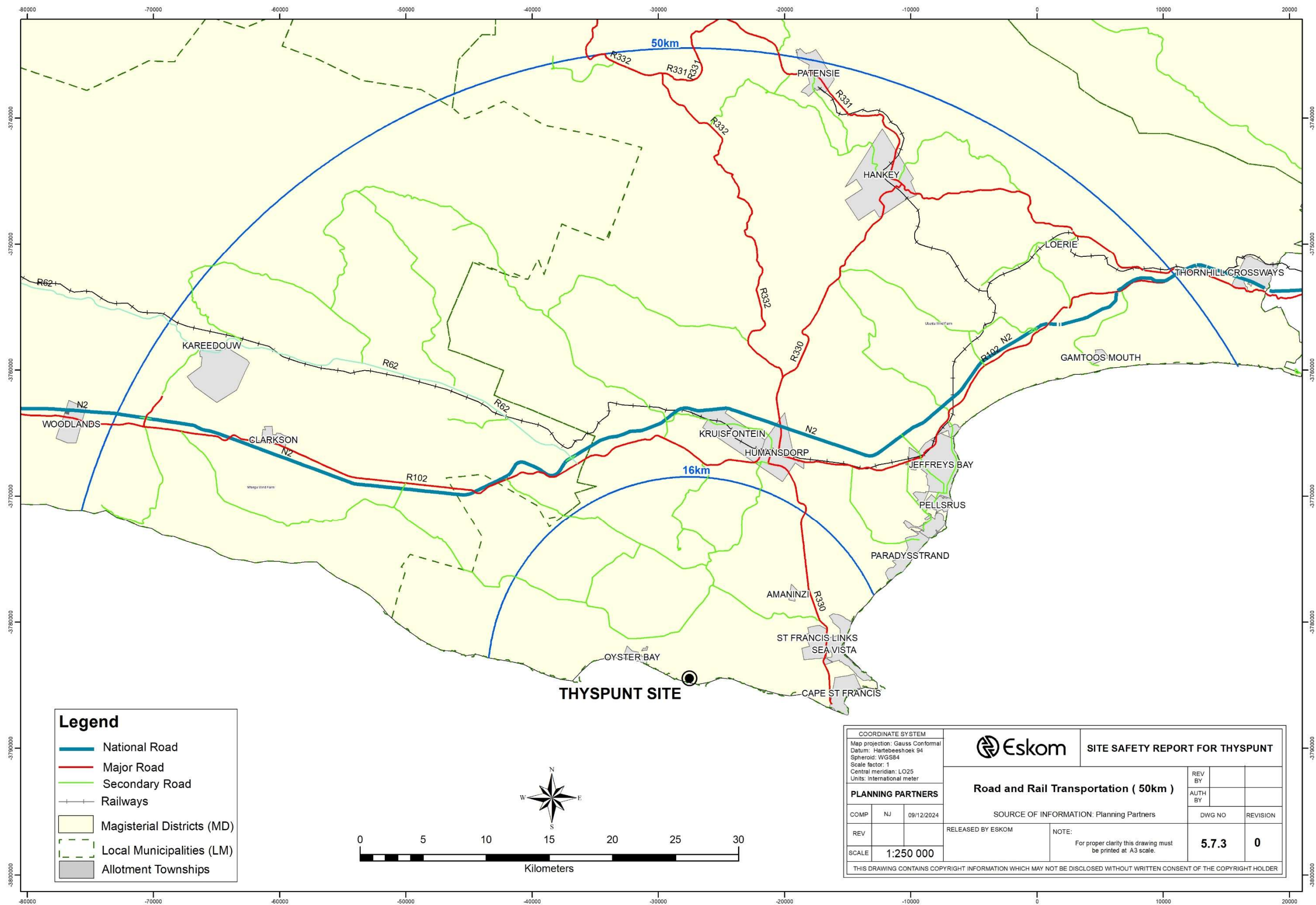
There are limited minibus taxi services within the site region. In the Kouga Municipality, there are three formal and two informal taxi ranks within the site region (located within Humansdorp, St. Francis Bay, Hankey and Jeffreys Bay) and a total of nine stops along the relevant transportation routes. In the Kou-Kamma Municipality, there are only two informal taxi ranks within the site region (located within Clarkson and Kareedouw) (Innovative Transport Solutions, 2024a).

b) Bus Services

Bus services within the site region are limited to long-distance operations along the N2 Freeway. This is the only long-distance bus route that passes through the site region, running along the N2 and R330. The only bus stop within the site region is in Humansdorp. On average, there are 20 buses per day that operate along that corridor (in both directions) (Innovative Transport Solutions, 2024a). There is also a bus service for day scholars that attend Woodridge College located approximately 55.21 km east-northeast. The service includes morning and afternoon services between the school and Cape St. Francis, St. Francis Bay, Jeffreys Bay, Humansdorp, Hankey and Patensie within the site region (Woodridge College, 2023). There is also a daily government subsidised transport service for scholars between Sea Vista in Oyster Bay and Humansdorp (GoundUp, 2024).

5.7.6.4 Off-road Activities

The nearest location to the site where off-road activities take place is the Brakkeduin 4×4 Trail, located 15 km west-northwest. It is a 14 km long circular trail and vehicles are limited to 4×4 vehicles (Venues, 2024).



	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-69

5.7.6.5 Future Road Network

(a) Site Access

The Thyspunt site does not currently have formal access routes and the construction of a new access road will be required (Innovative Transport Solutions, 2024b). The site can be accessed from the east, north or from the west. The western and eastern accesses were the preferred access alternatives previously recommended. However, due to the significant impact of these access roads on the surrounding environment and the land required for these accesses, it is recommended that only the eastern access off the R330 be constructed as a formal paved access road (refer to **Drawing 5.7.4**). The western access road should be constructed as a low order gravel access road that will serve primarily as an emergency access.

(b) Approach Routes – Construction Phase

An investigation of the possible approach routes towards the Thyspunt site for the construction phase has been completed. The following access routes from Humansdorp to the Thyspunt site and possible alternatives were evaluated (refer to **Drawing 5.7.4**):

- Oyster Bay Road;
- R330;
- Humansdorp Industrial Bypass.

(c) Abnormal Loads

The Eskom Nuclear 1 Project: Thyspunt Site Abnormal Haul Route Investigation was conducted in 2011 (Innovative Transport Solutions, 2024b). The purpose was to evaluate suitable routes for transporting the nuclear power plant equipment/ material classified as abnormal loads.

Abnormal permits are required for vehicles exceeding the allowable maximum dimensions on road freight transport in terms of the Road Traffic Act (Act No. 93 of 1996) wherein:

- A vehicle exceeds the length of 22 metres for an interlink, 18.5 metres for a truck and 13.5 metres for a single-unit truck.
- The vehicle is wider than 2.6 metres, a height of more than

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-70

4.3 metres from the ground and a load height of more than 2.7 metres.

Road freight transport that is above these dimensions of Abnormal Load requires an application to the Department of Transport and Public Works for a permit to provide authorisation for the transportation of abnormal loads. This applies to all public roads.

Based on the information obtained from the Abnormal Route Haul Investigation conducted in 2011, the dimensions of loads that should be accommodated include the weight of 630 tonnes, 11 meters in width, 8 metres in height and 46 metres in length. National, Provincial and Municipal roads are designed to support heavy loads and the abnormal loads should not exceed the structural capacity of the public roads along the transport route.

The Port of Gqeberha/Port Elizabeth and the Port of Ngqura (Coega) are both suitable harbours for the offloading of abnormal loads. However, Port of Gqeberha/Port Elizabeth is the preferred port as the route is shorter and require less re-construction and mitigation measures. Refer to **Drawing 5.7.4** for a portion of this route. The route follows Buffelsfontein Road (M9) and Seaview Road from the Port of Gqeberha/Port Elizabeth up to the N2, then via the N2 up to the interchange east of Jeffreys Bay, then along the R102 up to Humansdorp, then via Main Street to Park Street, then via the R330 up to the Eastern Access and then to the site.

The following mitigation measures will be required along the abnormal load route:

- There is a railway crossing along the exit of the Port of Gqeberha/Port Elizabeth that requires an upgrade for the haul vehicles.
- The overhead electric powerlines should be raised to accommodate the height clearance required.
- Overhead bridges – Transport vehicles will have to make use of on and off ramps at interchanges to avoid overhead bridges. Ramps and detour routes will have to be constructed where required.
- Under bridges – Propping will be required at most bridges to ensure stability during transportation. Strengthening and bracing will also be required at the Van Staden's bridge. Upgrades to intersections and

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-71

roundabouts to accommodate the turning movement of the abnormal vehicles.

- It is recommended that the abnormal load trips should occur during the off-peak hours in the evening, between 21:00 and 05:00 to reduce the impact on the traffic.

The recommended abnormal load route for abnormal load enters Humansdorp from the east along the Voortrekker Road. Using existing road infrastructure, the most suitable route through the town is directly down Main Street (**Drawing 5.7.4**). This is the widest street through the town and will not require any upgrading except for the main intersections with Voortrekker and Park Streets, which will need some widening to accommodate the large turning radius of the haul vehicles.

Traffic can be diverted via the other streets for the short period the abnormal load will disrupt Main Street traffic. However, during the previous studies concerns have been raised about the use of Main Street and other possible routes to bypass the town were investigated. Three new routes were investigated for the abnormal load bypass as follows (**Drawing 5.7.4**):

- The first route (Alternative A) is a direct link between Voortrekker Road (MR389) and the St. Francis Bay Road MR381 (R330) intersecting just north of Kwanomzamo. This is the shortest route for an eastern bypass, approximately 850 metres long and is the most practical for construction.
- The second route investigated (Alternative B) runs to the east of the suburb of Boskloof and traverses privately owned farmland. This route is approximately 1.3 km long.
- The third route (Alternative C) runs through farmland approximately 0.7 km east of Boskloof and joins MR381 approximately 1.5 km south of Kwanomzamo. The route follows existing cadastral boundaries where possible and is approximately 2.7 km long.

Due to the possible challenges with intersection upgrades and adjustments required along Main Street to accommodate the abnormal loads, it is recommended that the eastern bypass Alternative A be constructed to accommodate the abnormal loads. In the previous studies it was also concluded that Alternative A is the most beneficial option for the eastern bypass.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-72

(d) Mitigation Actions

The following mitigation actions are proposed to accommodate the construction and operational traffic for the Thyspunt site:

- Access to the Site
 - The eastern access should be constructed off the R330 to provide construction and operational access to the site.
 - The R330 should be widened to accommodate a dedicated southbound right-turn lane along the R330.
- External Road Upgrades
 - Maintenance strategies should be put in place such as crack sealing and overlay in the road sections that show signs of fatigue along the R330 between Humansdorp and St. Francis Bay.
 - Signage is required to warn oncoming vehicles that there is a speed hump that is located by the Sea Vista informal settlement.
 - Warning signage should be provided at existing pedestrian crossings along the R330.
 - Repaint the road markings where required along the access routes.
 - Construct a bypass road to the east of Humansdorp to accommodate construction traffic and abnormal load vehicles.
 - Upgrade the Voortrekker Road/Main Street/R300 intersection with signal control, should the eastern bypass not be constructed.
- Abnormal Road Route
 - The temporary road improvements for the abnormal load route should be constructed as recommended in the Eskom Nuclear 1 Project: Thyspunt Site Abnormal Load Haul Road Investigation report.
 - It is recommended that an eastern bypass (Alternative 1) should be constructed to accommodate abnormal loads through Humansdorp.
 - Abnormal loads should be transported between 21:00 and 05:00 during the week and in the daytime during the weekends.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-73

- Internal Requirements
 - Minibus taxis and busses should be provided to transport construction workers to the site. A total of 24 minibus taxi and 4 bus trips will be required to transport staff to the site during the operational phase.
 - The detail requirements for the public transport facilities on site should be confirmed during the design stage of the project.

(e) Further Studies Required

A comprehensive Construction Traffic Management Plan must be completed and approved by the relevant authorities before construction begins (Innovative Transport Solutions, 2024b).

5.7.7 Rail Transportation Network and Associated Infrastructure

The results of the characterisation and description of the regional rail transport network are presented in this section, with the up-to-date description of the current network and associated infrastructure. The characteristics that are important for nuclear safety (e.g. potential external hazards) were determined and are presented in this subsection. Planned extensions or improvements to the transportation network were also identified (Innovative Transport Solutions, 2024a).

The investigation is based on the data presented in the previous TSSR (Eskom, 2015) and the investigation determined if the data previously provided were still current and valid. Additional and updated data were also obtained where relevant.

5.7.7.1 Existing Rail Network

A section of the Gqeberha-Avontuur narrow gauge railway line is located 21.3 km north of the site (see **Drawing 5.7.3**). The rail gauge is 610 mm and the line is not electrified. Previously, rail traffic consisted of about three diesel-electric freight trains per week, hauling pulpwood from Assegaaibosch to Gqeberha. However, the railway line is currently not functional (Sarah Baartman District Municipality, 2022).

The line was also used by the Apple Express, a local tourist train. Tourist traffic on this section of the train line consisted of monthly weekend excursions from Gqeberha to Assegaaibosch and back (Sarah Baartman District Municipality, 2022).

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-74

No marshalling yards or loading areas are located within the site region (Sarah Baartman District Municipality, 2022).

The assessment of the status quo conducted in 2024 confirmed that there are no passenger or freight rail services available in the site vicinity. The existing narrow gauge railway line through Humansdorp has been out of service for many years (Innovative Transport Solutions, 2024a).

5.7.7.2 Future Rail Infrastructure

The rail infrastructure within the site region has been neglected and is in a state of dilapidation. The limited activity of the railway lines has, for the most part, not been addressed and no future development plans are known (Sarah Baartman District Municipality, 2022).

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-76

5.7.8 Marine Transportation Network and Associated Infrastructure

The results of the characterisation and description of the regional marine transport network are presented in this subsection, with the up-to-date description of the current network and associated infrastructure. Transportation on water bodies within the region is only relevant to the sea because none of the rivers in the region are navigable. The characteristics that are important for nuclear safety (e.g. potential external hazards) were determined and presented in this subsection. Planned extensions or improvements to the transportation network were identified.

The investigation is based on the data presented in the previous TSSR (Eskom, 2015a) and the investigation determined if the data previously provided were still current and valid. Additional and updated data were obtained where relevant.

Since transportation of hazardous substances by sea may originate outside of the site region a broader area of investigation has been selected, up to and beyond the 80 km radius. The investigation also considers the Port of Gqeberha/Port Elizabeth, which is located beyond the 80 km radius and is the closest commercial port to the site.

5.7.8.1 Commercial Ports in the Site Region

Commercial ports were investigated and are further described in terms of their layout, capacity, operations, cargo handled, and vessel movements as illustrated on **Drawing 5.7.5**.

a) Port of Gqeberha/Port Elizabeth

i) Overview

The Port of Gqeberha/Port Elizabeth (94.1 km northeast) is the largest commercial port located near the site. It is located in Algoa Bay and the City of Gqeberha. It is located midway between the Port of Cape Town and the Port of Durban. The port is managed by Transnet National Ports Authority (TNPA), a division of Transnet Ltd., and operates 24 hours a day and 365 days a year. TNPA handles all aspects of port management and control, compliance, management of hazardous substances and maintenance of port infrastructure, including quays and buildings (Planning Partners, 2024b).

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-77

The Port of Gqeberha/Port Elizabeth is located in the central region of South Africa and currently handles containers, manganese ore, liquid bulk, automotive, palletised fruit and general cargo. The demand for cargo handling refers to automotive and agricultural products in the Nelson Mandela Bay Metro, the Eastern Cape interior and hinterland. Also included, are manganese exports from the Northern Cape and imports of LPG and feedstock, imports of breakbulk cargo comprising of cement, steel rails, plates and coils and refined petroleum products for regional consumption.

With the Port of Ngqura in operation, the role of the Port of Gqeberha/Port Elizabeth is transitioning from being the primary central port to being a premier automotive hub port and also a waterfront port with passenger cruise ship services, as well as complementary services to Ngqura. The port also accommodates facilities for the local fishing and boat-repair industries and recreational boating.

The port is equipped to handle dry bulk, bulk liquid, general cargo and container cargo. Passenger ships usually make use of one of the fruit terminal berths when calling at Gqeberha. The port's container terminal has three berths totalling 925 m in length and a storage area of 22 ha, with 5 400 ground slots for stacking purposes. The container terminal is equipped with gantry container cranes and straddle carriers. The break-bulk terminal has six berths, totalling 1 170 m; two bulk berths totalling 360 m; and a tanker berth of 242 m. The tug, fishery and trawler jetties measure 120 m, 165 m and 136 m, respectively.

The port also has a comprehensive range of marine services, including towage (three tugs with a bollard pull of 50 t), pilotage, navigations berthing and pollution control. The port is a compulsory pilotage area and all vessels larger than 70 m must call Port Control when 3 nmi from the pilot boarding area for final berthing instruction. The pilot boarding area is situated approximately 2.5 nmi northeast of the breakwater light.

The port is equipped with an oil containment boom of 150 m in length, a skimmer and oil dispersing equipment. In the event of a distress call or other marine related incidents, the Port Control Tower operates as a rescue co-ordinating centre. A fire protection service is also provided for tankers and ships carrying dangerous cargo (Planning Partners, 2024b).

ii) Layout, Capacity and Operations

The Port of Gqeberha/Port Elizabeth comprises of three precincts namely: (i) Charl Malan Precinct, which is predominantly occupied by the

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-78

Container Terminal and Automotive Terminal; (ii) the Flemming Street Precinct for Multi-purpose Terminal (MPT) operations, fishing and cruise ships (cruise ships call at the port primarily for one-day city/safari excursions); and (iii) the Baaken's River Precinct which handles liquid bulk and manganese.

The Charl Malan quay accommodates the container terminals (Berths 102 and 103) and automotive terminals (Berth 100/101).

The MPT quay handles both dry bulk and breakbulk commodities. A secondary function of the MPT quay is to accommodate visiting cruise ships, fishing vessels and idle vessels seeking to dock in the port.

The fishing and ship-repair area includes two fishing jetties, two slipway lead-in jetties, 475 m of quay wall, two dry docking slipway cradles and three boat ramps/slipways. The precinct also includes a leisure-craft basin that occupies a large portion of the water area.

The manganese and liquid bulk are situated in the southern part of the port, but within the short-term, the rationalisation of port activities is planned to move manganese and liquid bulk to the Port of Ngqura. However, currently manganese is exported via Berth 13, whilst liquid bulk is handled at Berth 15. The manganese terminal incorporates a range of material handling equipment, conveyors and ship-loaders (Planning Partners, 2024b).



Figure 5.7.9
Port of Gqeberha/Port Elizabeth: Layout and Facilities

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-79

The entrance channel of the port has a depth of 14.5 m Chart Datum and a width of 310 m. Ships intending to anchor in the bay must keep clear of the approach channel (Planning Partners, 2024b).

With respect to freight handling at the port, container operations comprise deep sea, transshipment and coastwise trade. Break bulk demand is driven by import of steel coils/plates, steel rails, agricultural products and cement, as well as the export of cement. Manganese ore is the main dry bulk export commodity. Dry bulk handled at the MPT terminal includes wheat and fertilizer. Liquid bulk include petroleum and petroleum gas imports (mostly coastwise). This operation will be moving to the Port of Ngqura in the future. The port serves as an import and export facility for the automotive industry.

Fishing is the largest non-freight activity at the port. The port serves resident trawlers and accommodates fish processing facilities and aquaculture operations. Ship repair facilities cater primarily for repairs to the fishing trawlers and operates one slipway for the repairing of small fishing boats and yachts up to 1 200 t. Ship repairs are also possible in the sheltered waters of Algoa Bay (Transnet, 2019) (TNPA, 2024a). With planned upgrades, the port would be able to provide maintenance and repair services to larger vessels (TNPA, 2024a). The Algoa Bay Yacht Club, angling and spearfishing clubs are also accommodated in the port.

Bunkering for fishing trawlers is provided at a dedicated quay and is operated by licensed bunker supplier companies. The port provides bunkers via a flexible hose and a fixed shore connection (Transnet, 2019). HFO (maximum 150 Cst) is available at Berths 13, 14 and the tanker berth at a rate of 200 t per hour. Automotive diesel oil is available at the Dom Pedro quay and Berths 13 and 14.

Ship-to-ship bunkers take place at anchorage in Algoa Bay, operated by two licensed operators.

The port's capacity is set out in **Table 5.7.10**.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-80

Table 5.7.10
Port of Gqeberha/Port Elizabeth Capacity

Cargo Type	Berths	Usable Berths	Actual Volume (2021/2022)	Installed Berth Capacity
Containers (TEU)	102/103	2	134 123	400 000
Manganese (t)	13/14	1	5 405 092	6 000 000
Break-bulk (t)	8,9,10	3	3 779 000	
Automotive (MPT) (t)	100/101	1	122 458	150 000
Liquid bulk (kl)	15	1	1 002 569	3 000 000

Vessel limitations of the port are presented in **Table 5.7.11**. Deeper vessels may be accommodated in consultation with the Harbour Master (Planning Partners, 2024b).

Table 5.7.11
Port of Gqeberha/Port Elizabeth: Vessel Limitations

Vessel	Maximum Length (m)	Maximum Draft (m)
Passenger vessel	No limit	10.5 m
Dry cargo vessel	No limit	10.5 m
Container vessel	No limit	11.7 m
Tanker	203 m (660 ft)	9.4 m
Ore carriers	250 m (820 ft)	11.7 m

iii) Cargo Handled

The volumes of cargo and containers handled at the port during the January to December 2023 period is summarised in **Tables 5.7.12** and **5.7.13**. The information is categorised into dry bulk, liquid bulk and break-bulk volumes handled, as well as the number of containers handled. Containers are measured in TEUs (twenty-foot equivalent units) in line with international standards. Volumes are influenced by a number of factors, apart from the capacity of the port. Bulk cargo is influenced by petroleum prices. Agricultural products (also transported as bulk cargo) are influenced by weather and international prices. Container volumes are dependent upon ship calls and volumes. The cost of sea freight also affects cargo movement. It is therefore difficult to predict clear trends. The figures of cargo handled during 2023 are substantially higher than the figures previously recorded in 2007: 5 522 362 t (an increase of over

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-81

200 per cent), whereas 43.6 per cent less containers were handled in 2023 than in 2007. The latter is due to the container terminal expansion that was undertaken during this period (Planning Partners, 2024b).

Table 5.7.12
Port of Gqeberha/Port Elizabeth: Summary of Cargo
Handled (January to December 2023)

Cargo	Dry Bulk Cargo	Liquid Bulk Cargo	Break-bulk Cargo	Total Cargo
	(t)	(t)	(t)	(t)
Bulk landed:				
Imports	88 534	429 490	177 398	695 422
Total bulk landed	88 534	429 490	177 398	695 422
Bulk shipped:				
Exports	9 976 421	-	180 276	10 156 697
Total bulk shipped	9 976 421	-	180 276	10 156 697
Coastwise	-	509 818	31	509 849
Transshipment cargo:	-	147 414	-	147 414
Total handled (excluding vehicles):	10 064 955	1 086 721	357 705	11 509 381

For the period January to December 2023 the port landed 32 616 and shipped 126 961 vehicles respectively. A further 2 096 vehicles were transhipped. Volumes are second to the volumes handled by the Port of Durban.

The port ranks fourth in terms of volume handled after the ports of Richards Bay, Saldanha and then Durban (Planning Partners, 2024b).

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-82

Table 5.7.13
Port of Gqeberha/Port Elizabeth: Summary of Containers
Handled (January to December 2023)

	Containers Invoiced (TEUs)		
	Full	Empty	Total
Landed:			
Deepsea	40 067	16 778	56 845
Coastwise	14	3 669	3 683
Transhipped	8 129	2 995	11 124
Total landed	48 210	23 442	71 652
Shipped:			
Deepsea	40 647	34 770	75 417
Coastwise	-	2 803	2 803
Transhipped	5 658	2 892	8 550
Total shipped	46 305	40 465	86 770
Total	94 515	63 907	158 422

iv) Vessel Movements

Table 5.7.14 shows the overall port activity in terms of ship arrivals for 2023. Liquid and dry bulk represent the highest frequency of all vessels arriving at the port in 2023, at 31.7 per cent. Container vessels represent 16.1 per cent, tankers represent 14 per cent and ro-ros representing 8.6 per cent. General cargo vessels represented only 4.4 per cent of the total vessels in 2023. A number of passenger ships (29) arrived at the port in the period between November to April 2023. A number of South African fishing trawlers (57) arrived at the port over the period of October to December 2023. Passenger liner and fishing boat arrivals, therefore, appear to be seasonal. Only one foreign fishing vessel arrived at the port over this period (Planning Partners, 2024b).

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-83

Table 5.7.14
Port of Gqeberha/Port Elizabeth: Vessel Statistics (2023)

Number of Vessels Calling per Month	Vessel type												
	Containers	Bulkers	Tankers	General Cargo	Passenger	Vehicles	Ro-Ro	Other	Coast-wise	Foreign Fishing	SA Fishing Trawlers	Miscellaneous	Total
January	9	24	12	3	10	0	7	0	5	0	0	9	79
February	3	27	15	3	8	0	11	0	0	0	0	12	79
March	9	29	11	8	3	0	10	0	0	0	0	11	81
April	10	20	4	4	3	0	6	0	0	0	0	10	57
May	14	25	12	4	0	0	7	0	4	0	0	21	81
June	15	27	13	3	0	0	6	1	6	0	0	15	86
July	21	28	18	3	0	0	9	1	3	0	0	3	86
August	22	32	13	4	0	0	12	0	5	0	0	10	98
September	18	25	15	3	0	13	0	0	3	0	0	10	87
October	10	18	8	1	0	10	0	0	0	1	4	1	53
November	12	28	6	4	2	0	10	0	1	0	22	0	85
December	10	18	6	2	3	0	4	0	3	0	31	0	77
TOTAL	153	301	133	42	29	23	82	2	30	1	57	102	949

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-84

b) Port of St. Francis

Port of St. Francis (13.9 km east) is the nearest harbour to the site and the only harbour within the 50 km site region. It is a small fishing and recreational harbour that is privately owned and managed by the Port St. Francis Harbour Association and operates 7 days a week. Vessel movements in and out of the harbour are controlled via VHF radio.

The port is a working harbour and is home to a large fleet of squid, hake and pilchard vessels. The 800 m² Balobi fish processing factory is located on the harbour quay.

The harbour consists of a breakwater with an inside basin for commercial fishing vessels, with mooring at cement jetties and a section with a slipway facility for small recreational vessels (within the harbour). The harbour allows for a maximum vessel size of 65 ft (approximately 20 m) and allows 80 ft (approximately 25 m) for catamaran vessels, with a draft of no more than 3 m.

The harbour is utilised by 52 resident commercial fishing vessels and 160 resident recreational ski boats. The harbour also services 14 yacht moorings which are owned by two local yacht builders. The harbour also accommodates ski boats from Gqeberha, Plettenberg Bay, Knysna and Cape Town during annual fishing competitions. The harbour serves an additional of 40 ski boats (between 28 to 32 ft) during these competitions.

Entry to the port is access-controlled and a Harbour Master is employed to manage the facility. The National Sea Rescue Institute (NSRI) also operates from the Port of St. Francis. All vessels requiring access to the sea through Port St. of Francis, must get prior permission.

The harbour's fuel storage is under ground and holds a

Redacted

In addition, a number of sport and recreational fishing companies and clubs operate out of the Port of St. Francis, which are discussed in the TSSR **Section 5.6**.

5.7.8.2 Small Craft Launching Facilities

There are several small craft launching facilities for public use within 80 km radius of the site, as is illustrated in **Figure 5.7.10**. The following represent public launch facilities that have either been declared as public

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-85

launch facilities or are in the process of being declared as public launch facilities in accordance with Section 2(1) (Management of Launch Public of Sites in the Coastal Zone Regulations) in terms of the National Environmental Management Act 2008 (Act 24 of 2008). Each launch site is discussed hereafter.

a) Jeffreys Bay Main Beach (25.17 km northeast)

The public launch site at Jeffreys Bay Main Beach is managed by the Kouga Municipality and the operator is the Jeffreys Bay Angling Club.

b) Paradise Beach (19.83 km east-northeast)

In 2018 the Kouga Municipality advertised the registration as a public launch site of the Paradise Beach launch site for public comment. (Kouga Local Municipality, 2018).

c) Kromme River (12.33 km east)

In 2018 the Kouga Municipality advertised the registration of the Kromme River launch site (12.33 km east) as a public launch site for public comment. It consists of an informal access way, used for the launching of recreational vessels directly from the riverbank.

In addition to the above, launching of recreational vessels also occurs off riverbanks and from sandy beaches in the site vicinity, as well as from the marina in St. Francis Bay (Planning Partners, 2024b).

No comments were received, and in November 2018 the Kouga Municipality issued a notice that it was in the process of registering and promulgating these two sites in the Provincial Government Gazette (Kouga Local Municipality, 2018).

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-86

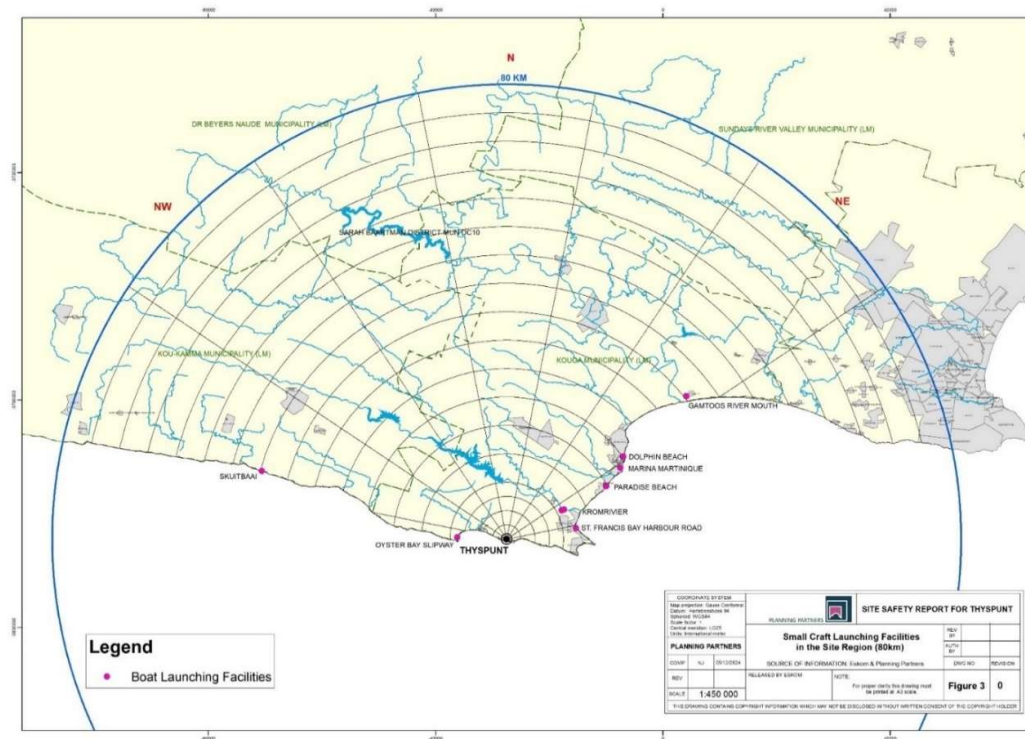


Figure 5.7.10
Public Launch Sites in the Site Region (80 km)

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-87

5.7.8.3 Shipping Lanes

South Africa is situated on one of the world's major shipping routes with large numbers of cargo vessels, including oil tankers, passing the Cape of Good Hope every day. The shipping lanes or Vessel Traffic Separation schemes that pass the site are shown in **Figure 5.7.11**, and **Drawing 5.7.5**. These shipping routes are standardised and have not changed since 2005. No planned changes to the sea traffic paths are currently known.

Two International Maritime Organisation approved traffic separation schemes (*IMO Resolution A.858 (20)*) are in force along the Agulhas Bank. They are obligatory for laden tankers. Cargo vessels may use the inshore routes, but if they navigate in the vicinity of the traffic separation schemes, they shall comply with the provision of routeing scheme. The traffic separation scheme that is nearest to the site region is located off FA Platform, 47 nmi south of Mossel Bay.

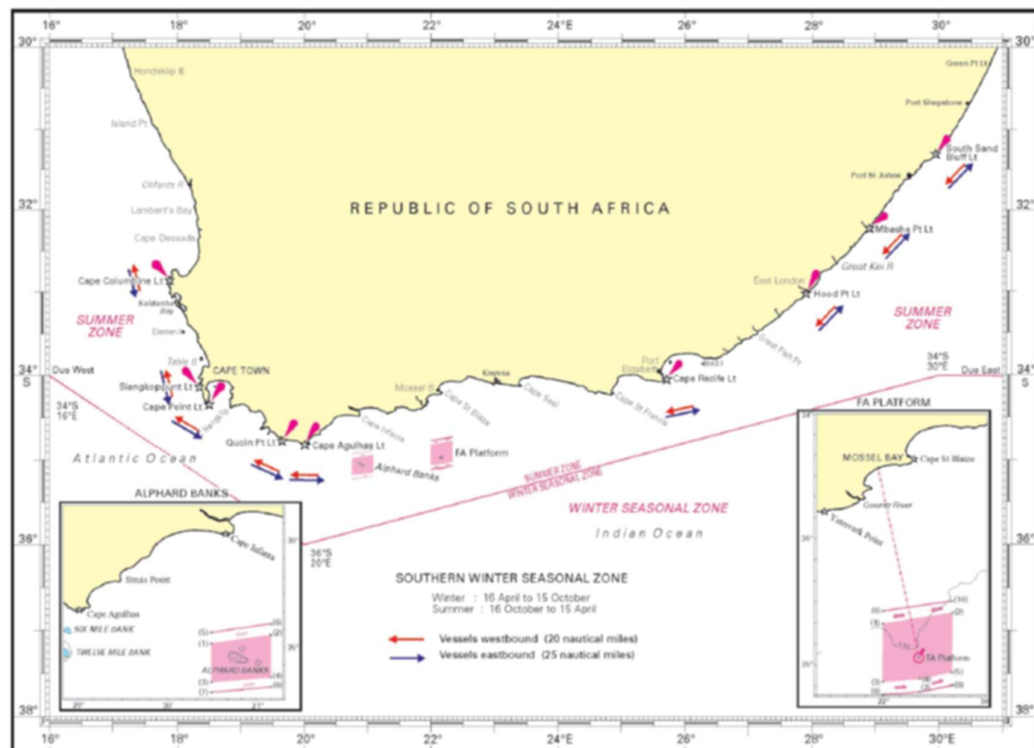


Figure 5.7.11
Shipping Lanes and Separation Schemes

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-88

Laden tankers, when westbound, off South African coasts, must maintain a minimum distance of 20 nmi (37 km) from certain capes, including Cape Recife (located at Gqeberha), and eastbound traffic must keep a distance of 25 nmi (46 km) off certain capes, including Cape Recife. During the winter season (16 April to 15 October) westbound laden tankers should maintain the minimum distance off 20 nmi of certain capes. Laden tankers engaged on voyages solely between ports in the Republic of South Africa are exempted from the above distance restrictions and are to maintain a distance of 10 nmi off these capes of the coast subject to weather, sea and current conditions, when setting courses to their ports of loading and discharging.

Even though boats, ships (including container ships) and other smaller vessels are permitted within 9.3 km (5 nmi) of the coast, for safety reasons these ships stay further away from the coast. Trawlers are not allowed within 30 km (16 nmi) of the coast.

The chokka fishing fleet fishes near the shore in shallow waters within the site vicinity.

In 2008, 20.5×10^6 t of crude oil were imported into South Africa through facilities in Durban and Saldanha Bay for processing in the local oil refineries. Additionally, some 225.0×10^6 t of crude oil per year passes the Cape going westwards and 101.0×10^6 t going eastwards. This volume decreased significantly since the peak period in 1997 when 630.0×10^6 t passed around the South African coastline (Eskom, 2015a). This changing trend was due to factors such as the re-opening of the Suez Canal in 1978, the increasing exploitation of oil reserves in the Western Hemisphere and the construction of a crude oil pipeline from the Middle East to the Mediterranean. More recent data, for the period 2015 to 2020 is reported on below and is summarised in **Table 5.7.15**.

The site is situated adjacent to the main traffic routes for vessels moving from both east-west and west-east around the tip of Africa. The site is situated on a significant shipping route, with the bulk of the traffic navigating at least 20 nmi offshore. Bulk carriers constitute the majority of the traffic, followed by container vessels, oil tankers and general cargo vessels. Tanker traffic separation schemes are illustrated in **Drawing 5.7.5**. Westbound vessels must maintain a distance of 20 nmi (37.0 km) from the coast and eastbound vessels have to maintain a distance of 25 nmi (46.3 km) from the coast (Planning Partners, 2024b).

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-89

Data on vessel movements passing in the vicinity of Cape Town obtained for the period 2015 to 2020 are summarised in **Table 5.7.15** (VesselTracker / Wood MacKenzie, 2022).

A total of 118 004 vessels (bulk carriers, general cargo, container and tanker ships) passed Cape Town during 2020. Site specific data could not be sourced for Thyspunt, but it can be expected that the majority of ships that pass Cape Town, also pass the Thyspunt site. The table shows a steady increase in vessel movements from 2015 to 2020.

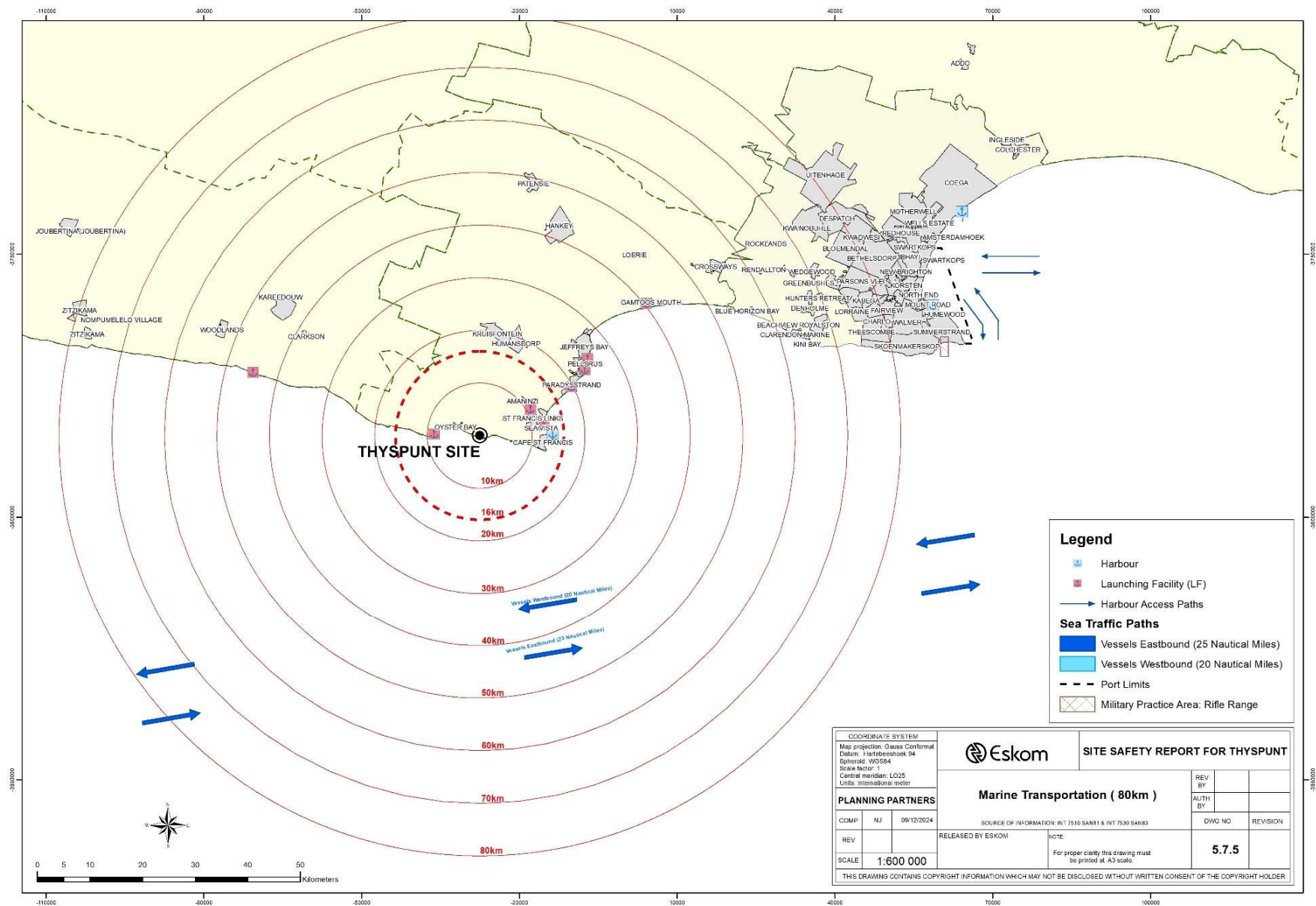
Table 5.7.15
Vessel Movements Past the Cape of Good Hope (2015 to 2020)

Vessel Type	2015	2016	2017	2018	2019	2020
Bulk carriers EW	11 400	9 477	8 502	7 232	15 930	15 612
Bulk carriers WE	10 781	9 167	8 095	6 747	15 791	14 916
General cargo EW	14 126	16 958	18 009	18 228	21 443	19 691
General cargo WE	13 561	16 621	17 569	17 752	20 863	18 972
Container vessels EW	7 933	7 437	6 813	5 447	10 975	9 942
Container vessels WE	8 049	7 554	6 806	5 598	10 888	9 620
Tankers EW	8 780	9 633	10 611	9 046	16 041	14 674
Tankers WE	8 958	9 597	10 410	8 938	15 816	14 577
Total:	83 588	86 444	86 815	78 988	127 747	118 004

In 2023, it was estimated that about 6 million barrels of oil per day of seaborne-traded crude oil moved around the Cape of Good Hope in both directions. In 2023, crude oil transit around the Cape accounted for roughly 7.7 per cent of global maritime trade (US Energy Information Administration, 2024).

5.7.8.4 Mainland Water Transport

There are no canals or dredged channels located within the site region that are used for commercial transportation purposes. Residential marinas are located in St. Francis Bay and Jeffreys Bay and used for recreational and tourism purposes. The Kromme River however is navigable for approximately 11 km and is used by leisure craft.



	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-91

5.7.8.5 Future Marine Transportation

a) Port of Gqeberha/Port Elizabeth

The National Ports Framework Plan (2022) proposes that the future of the Port of Gqeberha/Port Elizabeth is to become: (i) the premier automotive port; (ii) a multi-purpose terminal; (iii) a marine engineering activity focusing on boat and yacht building and vessel repairs; and (iv) a 'Smart People's Port' focusing on leisure, recreational and tourism activities (TNPA, 2022).

Transnet has a short, medium and long term strategy for the Port of Gqeberha/Port Elizabeth. **Figure 5.7.12** illustrates the current port layout. The figures thereafter illustrate the current, short term, medium term and long term layouts of the port's main activities and cargo types. These indicate the planned changes to port layout and use composition.



Figure 5.7.12
Port of Gqeberha/Port Elizabeth: Current

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-92



Figure 5.7.13
Port of Gqeberha/Port Elizabeth: Short Term Plan

The short term development plan (See **Figure 5.7.13**) includes the (1) repurposing of Charl Malan Quay for the extension of automotive capacity, due to the migration of containers to the Port of Ngqura; (2) the acquisition of land parcels to increase MPT storage by 4 ha; (3) the decommissioning of the liquid bulk terminal, due to the development of the liquid bulk facility in the Port of Ngqura; (4) the decommissioning of the manganese terminal due to development of the manganese terminal in the Port of Ngqura; (5) the extension of maritime engineering towards the southern side of the port, incorporating Shop 17; and (6) maritime development up to the Shop 17 boundary. Note the numbers in the text relate to the numbers in **Figure 5.7.13** (Planning Partners, 2024b).

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-93

Redacted

Figure 5.7.14 Port of Gqeberha/Port Elizabeth: Medium Term Plan

The medium term development plan includes (the numbers in the text relate to the numbers in **Figure 5.7.14**): (1) the repurposing of Charl Malan Quay for the extension of automotive capacity to include Berth 102 and its back-of-berth area; (2) the land to the rear of the fishing berth to be converted from Maritime Commercial to Fishing and the fishing area along the port boundary to be converted into Maritime Commercial; (3) the cut and fill of land at the rear of Berth 15 to shift and reposition Berth 15 closer to the land (this option will accommodate a larger turning circle if required); (4) land reserved for TNPA future use; (5) the further development of a leisure and recreational marina; (6) recreational beach development and dune stabilisation; and (7) conversion of Berth 13 to a passenger ship berth. Note the numbers in the text relate to the numbers in **Figure 5.7.14**.

The long-term development plan includes (the numbers in the text relate to the numbers in **Figure 5.7.15**): (1) the port extension to the northern side of the port, which is expected to provide additional quay length and fishing sector area; (2) the extension of the breakwater towards the northern side of the port and realignment of the entrance channel; (3) the relocation of aquaculture to the northern side of the port due to future expansion that is expected to take place at Charl Malan Quay; (4) developing an offshore island for leisure activity; and (5) the

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-94

expansion of Maritime Commercial, which will include the construction of two passenger ship berths. Note the numbers in the text relate to the numbers in **Figure 5.7.15** (Planning Partners, 2024b).



Figure 5.7.15
Port of Gqeberha/Port Elizabeth: Long Term Plan

b) Port of St. Francis

The Port of St. Francis was initially managed as a single entity. In 2007 the ownership and management of the port was restructured with the commercial port being separated from the residential component of the port; the latter being managed by a number of homeowners associations. The port is currently at capacity and cannot easily accommodate larger fishing vessels than those it currently serves. Due to the fractured ownership structure, it is unlikely that the port will be extended in the foreseeable future. Landward expansion is restricted by existing urban development of a predominantly residential character.

5.7.9 Industrial Development

Important industrial development nodes and activities in the site region were investigated in 2012 and verified in 2024 and are described below. The description makes specific reference to the type, scale and significance of industrial activity that occurs or is concentrated in industrial nodes in the site region (see **Drawing 5.7.6**). Growth potential

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-95

is demonstrated through current observed trends, new industrial nodes and planned expansions, taking into account the policies and proposals of the relevant Spatial Development Frameworks and maps.

The investigation was focused on existing industrial nodes, the current rate of development, main industrial activities and employment rates. The analysis was particularly focused on demonstrating adequate understanding of the industrial development in the site region, the potential for industrial development expected to occur in the site vicinity over the lifetime of the nuclear installation(s) and the location of potential stationary hazards related to industrial activity in the site vicinity, at present and in the future.

The site investigation was focused on current rate of development, main industrial activities and employment rates. The analysis was particularly focused on demonstrating adequate understanding of the industrial development within 35 km in order to include Humansdorp; the potential for industrial development expected to occur within 16 km of the site over the lifetime of the nuclear installation(s) (see **Subsection 5.7.9.8**); and the location of potential for stationary hazards within 16 km of the site at present and in the future (see **Section 5.7.15**).

5.7.9.1 Overview of the Eastern Cape Economy

As illustrated in **Figure 5.7.16**, the Eastern Cape economy has followed the historic national economic trend, albeit slightly underperforming for most years. The figure indicates that the province's contribution to Gross Domestic Product (GDP) has been steadily declining since 2011, after a strong recovery from the 2008/2009 global financial crisis and experienced a negative growth rate of 0.2 per cent in 2018. Although the province's growth rate moderated in 2019, it fell by 4.3 per cent in 2020 due to country-wide COVID-19 lockdown restrictions, similar to other provinces. The Eastern Cape recovered from the lockdown impact, recording a growth rate of 4 per cent in 2021. Stats SA data shows a much slower and more volatile growth rate for the Eastern Cape. According to StatsSA 2019, Eastern Cape fell sharply in 2019, recording a negative growth rate of 1.1 per cent (Planning Partners, 2024c).

In addition, the Province's GDP growth averaged 0.5 per cent quarter-to-quarter during the first two quarters of 2023. For 2023, economic growth for the province was anticipated to average 0.9 per cent, gradually improving to 1.8 per cent over the short-term period. The province accounted for 7.6 per cent of the national GDP in 2023.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-96

The Eastern Cape, like the rest of the country, is forecasted to experience a moderate economic recovery from the 2019 COVID pandemic, which is linked to a projected South African GDP growth increase from an estimated 0.6 per cent in 2023, to 1.3 per cent in 2024 and 1.6 per cent in 2025. However, the prevalence of electricity loadshedding and the inefficiency experienced at ports and freight rail, as well as inflation, could continue to disrupt economic activity and limit the country's economic and export potential.

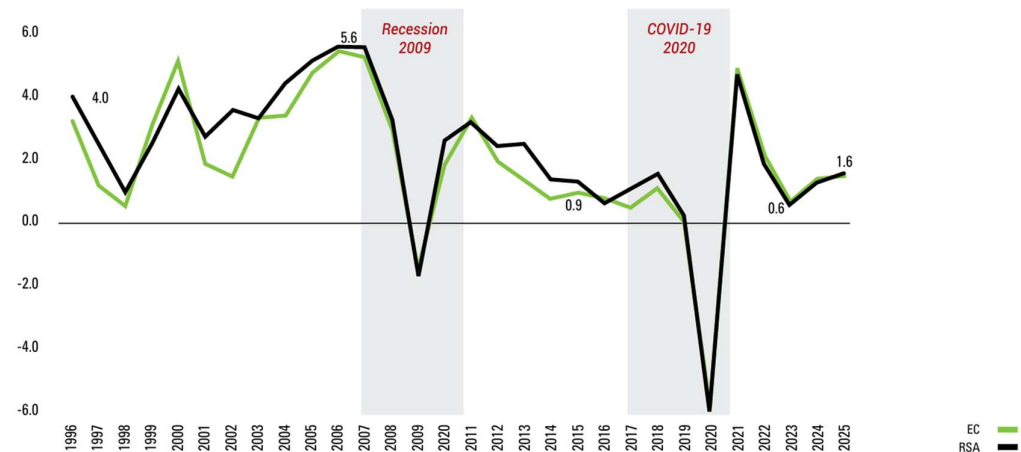


Figure 5.7.16
South Africa and Eastern Cape Economic Outlook (IMF Projections)

At a regional economic level, the site region is contained within the Kouga and Kou-Kamma municipal areas. These two municipalities form part of the wider Sarah Baartman District Municipality, along with five other local municipalities. **Figure 5.7.17** indicates the national, provincial and the more detailed Sarah Baartman GDP trends. As shown in the figure, the Sarah Baartman District Municipality's contribution to the provincial GDP has remained constant at approximately 10 per cent between 2011 and 2021. Similarly, the Sarah Baartman District Municipality's contribution to the national GDP has remained constant at approximately 0.8 per cent for the same period.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-97

	Kou-Kamma	Sarah Baartman	Eastern Cape	National Total	Kou-Kamma as % of district municipality	Kou-Kamma as % of province	Kou-Kamma as % of national
2011	1.7	25.8	255.4	3,327.0	6.5%	0.65%	0.05%
2012	1.8	29.0	283.4	3,566.4	6.4%	0.65%	0.05%
2013	2.0	31.5	305.7	3,868.6	6.3%	0.65%	0.05%
2014	2.1	33.8	326.3	4,133.9	6.3%	0.65%	0.05%
2015	2.3	36.6	352.9	4,420.8	6.3%	0.65%	0.05%
2016	2.4	38.9	373.2	4,759.6	6.3%	0.66%	0.05%
2017	2.6	41.7	400.4	5,078.2	6.3%	0.66%	0.05%
2018	2.7	43.6	421.2	5,357.6	6.3%	0.65%	0.05%
2019	2.8	44.8	435.6	5,605.0	6.3%	0.65%	0.05%
2020	2.8	43.7	423.5	5,521.1	6.3%	0.65%	0.05%
2021	3.0	48.0	467.8	6,206.3	6.3%	0.65%	0.05%

Figure 5.7.17
Gross Domestic Product Trends (2011 to 2021) (Figures in Billions)

The following graph illustrates the proportion of GDP contribution the local Kouga and Kou-Kamma municipalities made to the district Sarah Baartman District Municipality in 2021. The Kouga Municipality provided the largest proportion to the GDP, while the Kou-Kamma Municipality provided the second smallest contribution (See **Figure 5.7.18**).

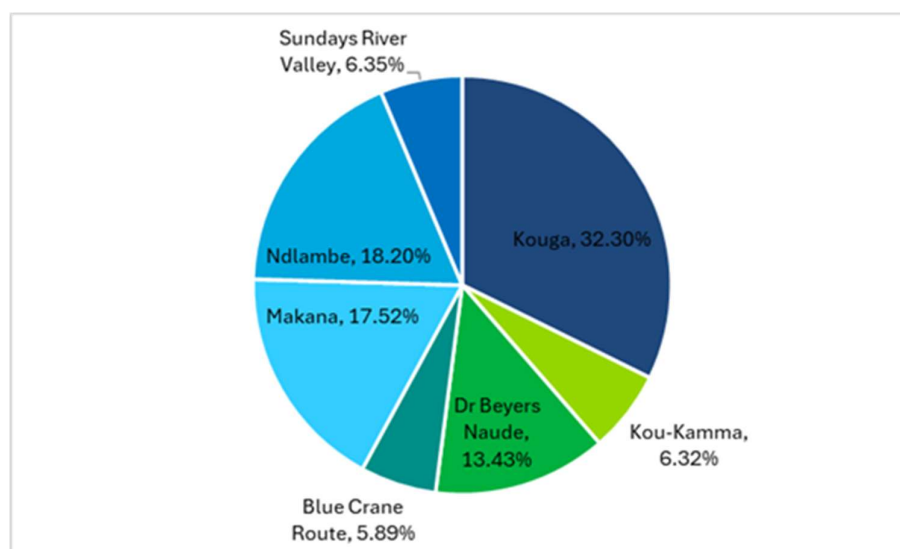


Figure 5.7.18
Gross Domestic Product for the Sarah Baartman District Municipality

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-98

The tertiary sector is the largest contributor to the Eastern Cape economy, followed by the secondary and primary sectors¹⁰. The total Gross Value Added (GVA) in the Eastern Cape was recorded as R333.2 billion in the fourth quarter of 2023, of which 82 per cent was produced by the tertiary sector, 16 per cent by the secondary sector and 2 per cent by the primary sector.

The leading industry sectors include the government services sector, trade, catering, and accommodation; finance, real estate, and business services; and manufacturing. While the government remains the dominant sector within the Eastern Cape Province's rural districts, the manufacturing sector (especially the automotive sector) has the strongest presence in the Province's metros, i.e. Gqeberha, East London, Kariega and Makhanda, all of which are located outside of the site region. **Figure 5.7.19** illustrates the latest short-term trends within each sector within the Eastern Cape economy. All sectors have maintained their respective contributions, except the agricultural sector which has shown a decline.

	2022Q4		2023Q3		2023Q4	
	R million	Share %	R million	Share %	R million	Share %
Agriculture	7 557	2,3	6 030	1,8	5 486	1,6
Mining	573	0,2	585	0,2	605	0,2
PRIMARY SECTOR	8 130	2,5	6 614	2,0	6 091	1,8
Manufacturing	41 281	12,5	41 981	12,6	41 950	12,6
Electricity	4 522	1,4	4 527	1,4	4 648	1,4
Construction	8 859	2,7	8 658	2,6	8 549	2,6
SECONDARY SECTOR	54 661	16,6	55 166	16,5	55 147	16,6
Trade	51 328	15,6	51 654	15,5	50 283	15,1
Transport	21 276	6,5	21 272	6,4	21 816	6,5
Finance	63 867	19,4	65 203	19,6	65 524	19,7
Personal services	92 693	28,1	95 419	28,6	96 358	28,9
Government services	37 632	11,4	38 177	11,4	37 964	11,4
TERTIARY SECTOR	266 795	80,9	271 725	81,5	271 944	81,6
All industries at basic prices	329 586	100,0	333 505	100,0	333 182	100,0

Figure 5.7.19
Eastern Cape Gross Value Add by Industry

¹⁰ The primary sector harvests or extracts raw materials (agriculture and mining), the secondary sector processes or uses raw materials (manufacturing, electricity and construction), and the tertiary sector sells and supports the activities of the other two (trade, transport, finance and community services).

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-99

Personal services are the largest economic sector, accounting to 28.9 per cent of the Province's GVA. Finance (19.7 per cent) and trade (15.1 per cent) make up the second and third largest sectors respectively. Manufacturing is the fourth largest economic sector, accounting for 12.6 per cent of the provincial GVA. The manufacturing sector is dominated by the food and beverage industry making up 25 per cent of the sector's output, followed by transport equipment and petroleum. Construction is the second largest subsector within the primary sector in the province, accounting for 2.6 per cent of the total provincial GVA. The province has limited mining activities, as the sector accounted for a modest 0.2 per cent of the provincial GVA in 2021.

The agricultural sector is showing signs of upward growth with recovery from -12 per cent contraction in the first quarter of 2023 to 4.2 percent growth in the second quarter. The growth was primarily driven by higher production and delivery levels of summer field crops and various horticulture products (Eastern Cape Treasury, 2023). The agriculture, manufacturing, construction and transport sectors are expected to drive growth recovery over the coming medium-term period.

Private sector investments have contributed close to R127 billion, and these investments are from various sectors of the economy such as manufacturing, agri-processing, automotive, renewable energy, creative industry, tourism and information and communication technology. The two Special Economic Zones, the East London Industrial Development Zone and Coega Development Corporation (both located outside of the site region), are the strategic economic centres for operationalisation and implementation of these investments.

At a regional level the following **Table 5.7.16** lists the trend of contribution by each sector to the GVA within the Sarah Baartman District Municipality. As shown, the community services sector contributed the highest proportion to the district GVA, followed by the trade and finance sectors. The agricultural sector was the third lowest contributing sector.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-100

Table 5.7.16
Sarah Baartman District Municipality Gross Value Add
by Industry

	2016	2017	2018	2019	2020	2021	Average Annual growth
Agriculture	1.33	1.44	1.48	1.52	1.56	1.61	3.89%
Mining	0.18	0.18	0.18	0.18	0.19	0.19	0.17%
Manufacturing	1.90	1.90	1.93	1.96	2.01	2.07	1.76%
Electricity	0.18	0.18	0.18	0.18	0.19	0.20	1.18%
Construction	1.66	1.69	1.72	1.76	1.82	1.89	2.67%
Trade	4.71	4.75	4.83	4.94	5.11	5.28	2.32%
Transport	1.70	1.72	1.75	1.79	1.84	1.90	2.23%
Finance	3.54	3.56	3.64	3.73	3.84	3.96	2.26%
Community services	6.41	6.50	6.51	6.58	6.69	6.84	1.31%
Total Industries	21.61	21.92	22.22	22.65	23.24	23.93	2.06%

The province recorded an increase of 15 000 new employment opportunities in the third quarter of 2023. The largest employer in the province was the government services sector, which contracted by 0.6 per cent in the fourth quarter. With regard to provincial employment trends (1995 to 2023), there is significant variability, showing periods where employment was highly responsive to economic growth, while opposite to this, a notable period of negative elasticity, where employment declined despite economic growth. This situation underscores the complexities of the labour market and the influence of external factors such as economic policy, technology and globalisation. In addition, the capital-to-labour ratio has increased significantly, indicating the economy to be more capital-intensive, which has implications for employment types and skills demand, e.g. a lower demand for unskilled labour.

An important characteristic to consider in the Eastern Cape economy is its rural and agricultural character, recording 20 per cent of the national total of agricultural households (a total of 422 542 households) in 2022 (Planning Partners, 2024c).

5.7.9.2 Industrial Development in the Site Region

The main economic sectors in the Kouga Municipality are agriculture, tourism and hospitality (Kouga Local Municipality, 2019).

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-101

Industrial areas within the site region are located at Jeffreys Bay, Humansdorp and St. Francis Bay.

a) Agro-Industrial

The Department of Rural Development and Agrarian Reform (DRDAR) has a strategy in place known as the Eastern Cape Agricultural Economic Transformation Strategy. This strategy aims to enable rural communities, such as targeted small holder/subsistence or communal farmers, to derive optimal economic value out of their agricultural activity through customised government supported partnership with organised commercial partners. This is a form of investment to expand agricultural economic activities, technology capabilities, training, employment opportunities and general growth in the sector. Part of the five-year development targets for commodity based transformation projects is the citrus project in the Sarah Baartman district which is said to employ about 3 000 citrus workers and 100 farmers in partnership with Citrus Growers Association and Development.

An opportunity to develop agri-industrial facilities (agri-hubs), both in conjunction with the government or as private initiatives, has been identified for the Kouga Municipality. There is the possibility for the location of new, intense production to the north of the N2 Freeway, as well as the expansion of the existing industrial area around the solid waste site to accommodate agri-support, processing and storage facilities associated with the agri-industry/hub.

These initiatives could strengthen the agricultural sector within the site region and indicates the local government's support for this economic sector (Planning Partners, 2024c).

b) Manufacturing

In terms of the 2019 sectoral analysis of the Eastern Cape economy there has been a consistent decline in the GDP growth rate since 2011. Manufacturing moderated to around 1.0 percent, down from 2.3 percent in 2018. Large established companies are the main drivers of this modest growth. With manufacturing a traditional strength in the Eastern Cape's two metros, the relative decline in GDP contribution also impacts negatively on job creation within the province. With the current national fiscal constraint, lack of adequate public investment and poor weather conditions, the growth prospects of the province are expected to be impacted negatively. In 2019, the Eastern Cape economic growth was expected to be around 0.4 percent, before reaching 1.5 percent by 2022

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-102

(Planning Partners, 2024c). In the second quarter of 2024, the manufacturing sector was in decline but was expected to improve in the second half of 2024 (Eastern Cape Industrial News, 2024).

5.7.9.3 Industrial Areas in the Site Region

Drawing 5.7.6 illustrates the industrial areas within the site region. The following subsections provide information on the individual industrial areas in terms of size and the types of industries located in each.

a) St. Francis Area

St. Francis Bay has a small industrial area (11.36 km east) located to the east of Sea Vista, which is characterised by fish processing facilities, retail warehousing servicing both the construction, fishing and recreational boating sectors as well as small service-related industries. Some manufacturing occurs e.g. Shakti Shanti clothing were observed in a site visit. The total extent of industrial land within the region is approximately 316 ha. The area has 57 industrial zoned erven, of which 17 erven are still vacant. The Port of St. Francis also has limited industrial uses including ship repair services. (Planning Partners, 2024c).

Site visits conducted in 2024 indicate that the industrial area serves the boating and fishing industry. There is an active boat building industry, as well as enterprises that serve the construction industry on a small scale.

b) Humansdorp Industrial Area

Humansdorp (19.61 km north-northeast) contains the most important industrial area within the site region, with 39.3 ha of industrially active land comprising both light and heavy industrial activities, as well as agri-industrial facilities, e.g. a dairy and silos. The industrial node is located to the north of the Central Business District and is a well-defined area with available land to expand. The area has 75 industrial zoned erven, of which 27 are still vacant. (Planning Partners, 2024c).

c) Jeffreys Bay Industrial Area

Jeffreys Bay has two small industrial areas (24.53 km north-east). The northern proposed industrial area is located to the north of the R102 Road and St. Francis Street intersection and contains 60 industrial zoned erven, all of which have as yet to be serviced. The southern industrial area is not fully developed and is located at the intersection of Koraal Street and Dolphin Drive. The area contains 55 industrial zoned

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-103

erven and fully serviced. This area is aimed at service-related and light industries (Planning Partners, 2024c).

5.7.9.4 Scattered Industrial Areas within the Region

- Vlakteplaas Quarry

The Vlakteplaas quarry is located on the farm Vlakteplaas, 10 km to the east of Jeffreys Bay and is the main supplier of aggregates for the local area. The quarry is the producer of crushed stone, gravel, filling and washed sand, boulders and roadbuilding material for the residential, commercial and industrial construction sector. The quarry is also a supplier of material sourced from other local producers who produce cement bricks, blocks, pavers, ready-mix concrete, cobblestones and landscaping pebbles (Planning Partners, 2024c)

- Langkloof Bricks

Langkloof Bricks is located along Paradise Beach Road between Jeffreys Bay and Humansdorp. It uses between 1 000 and 1 500 t of spiral/duff coal per month, with a bunkered volume of less than 500 t at and given time, as well as 30 t of small nuts coal (Planning Partners, 2024c).

- Ubuntu Bricks

Ubuntu Bricks is a factory located at Vlakteplaas along the R102 Road, on the farm next to the Vlakteplaas quarry. Ubuntu Bricks produces masonry, stock bricks, maxi bricks and hollow blocks. Ubuntu Bricks also does ready mix concrete and are the main concrete suppliers for the area Sea Vista Industrial Estate.

The Sea Vista industrial area is located close to Sea Vista Township in the area of St. Francis Bay (Planning Partners, 2024c).

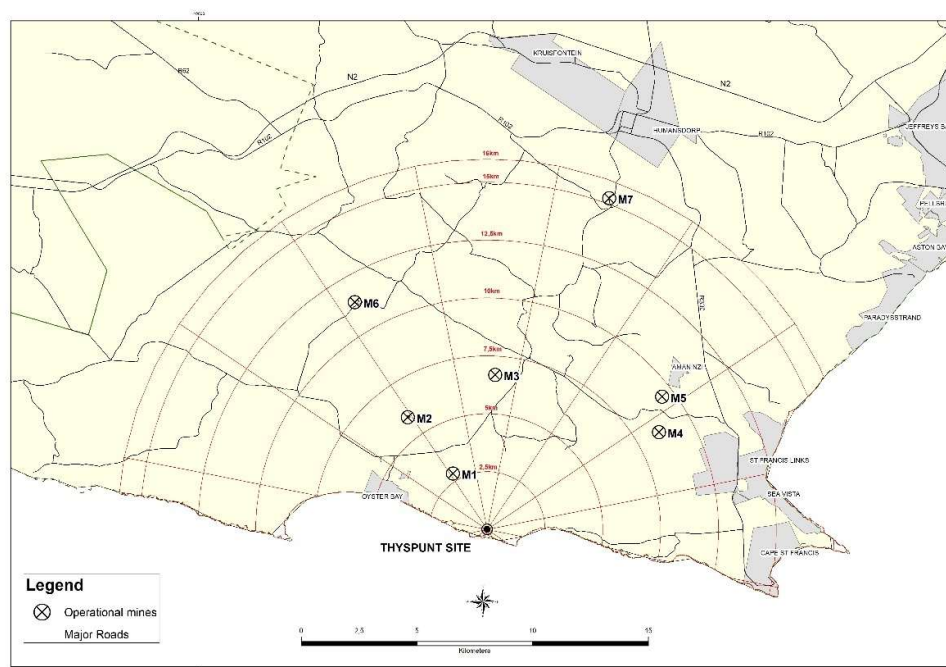
5.7.9.5 Coal Burning Installations

There only coal burning installations located within the site vicinity is the Langkloof Bricks (indicated as M7 on **Figure 5.7.20**, 15.25 km north-northeast) and consumes on average 18 000 t of coal within a year (Planning Partners, 2024c).

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-104

5.7.9.6 Mining Activities in the Site Vicinity

The location and distribution of mining activities in the site vicinity were investigated to identify potential sources of human-induced events and to identify any large or significant mining activities in the site vicinity that might require transport of hazardous materials close to the site. Data were sourced from the Department of Mineral Resources and Energy (DMRE) web-published record of operating mines in the Eastern Cape for the 2022/2023 period. Current aerial photography was used to determine the extent of the mining area and the percentage thereof that is currently actively mined. Their location relative to the site centroid are indicated in **Figure 5.7.20** below (Planning Partners, 2024c).



	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-105

mines for aggregate and sand with a current mining footprint of 0.43 ha.

Two sand mines are located close to St. Francis Bay, situated at 8.53 km (east-northeast) with a mining footprint of 0.1 ha and at 9.49 km (northeast), with a mining footprint of 0.18 ha. A sand mine is located 11.36 km (north-northwest) with a mining area of 1.75 ha. Two aggregate and sand mines are located at 5.93 km (northwest) with a mining area of 1.56 ha and at 6.69 km (north) with a mining footprint of 0.2 ha.

Table 5.7.17 sets out the names, resource mined and distance and location of operational mines within the site vicinity.

Table 5.7.17
Mines within the Site Vicinity (2022/2023)

Code	Name	Type/Resource	Distance (km)	Direction
M1	Thyspunt	Aggregate and natural sand	2.83	NNW
M2	Supacrush	Aggregate and natural sand	5.93	NW
M3	Oesterbaai -Eastern Cape	Aggregate and natural sand	6.69	N
M4	Lavender Hill Sand	Natural sand	8.53	ENE
M5	Wahloo Sand	Natural sand	9.49	NE
M6	Green Agri Trust	Natural sand	11.36	NNW
M7	(Langkloof Bricks)	Clay brickmaking, shale brickmaking	15.25	NNE

The characteristics of the identified quarries and sand mines are that they are relatively small operations, directly related to the construction industry and occur in areas close to the existing towns where most new construction takes place or are located in rural areas to provide material for road maintenance purposes. These operations could involve the use of commercial explosives. The transportation of explosives within the site vicinity is discussed in **Section 5.7.14.7**. These operations tend to change location as sand and stone reserves at a particular locality are exhausted and new sources become known. The occurrence of these activities will therefore need to be monitored over the lifetime of the nuclear installation(s) (Planning Partners, 2024c).

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-106

5.7.9.7 Pipelines

Investigations were conducted in the site vicinity to identify any pipelines in the site vicinity. On the basis of currently available data, there are no gas or fuel pipelines occurring within 16 km of the site.

5.7.9.8 Future Industrial Development within the Site Region

Humansdorp is one of the biggest urban nodes in the Kouga local municipal area with a strong administrative, commercial, agricultural and industrial central place function. Humansdorp has the ability to expand and play a more dominant role in the greater Kouga area. Opportunities for future industrial development within the site region are mainly focused within Humansdorp. The Kouga SDF has allocated land to the west, north and east of the existing industrial area for future expansion. This area has been designated as a “Special Industrial Zone” as it is intended to accommodate a potential port terminal, associated industrial uses, energy industries and agri-industrial uses (see **Drawing 5.7.6**).

St. Francis Bay/Cape St. Francis has a small limited commercial and industrial area and is largely dependent on the larger centres of Humansdorp and Jeffreys Bay for this purpose. The area around the intersection of the R330 and Homestead Road is indicated to have potential for industrial development, envisaged for the fishing and recreation boating industry, as well as for industrial/manufacturing ‘hives’. The need for the development of additional warehousing and storage facilities has been identified by the Kouga Municipality. The SDF proposes that the area be developed for mixed use, retail, service industries, warehousing and high density residential uses. No additional areas have been earmarked for future industrial expansion.

An approved industrial area in Jeffreys Bay, located to the north of the intersection of the R102 Road and St. Francis Street, has not been fully serviced as yet and will accommodate future industrial uses. This development is called the Fountains Industrial Park and forms part of the Fountains Estate, which will also serve as a new centralised business hub for the region that starts at Gqeberha through Langkloof, Oudtshoorn and to George. The development is 2.5 km from the N2 Freeway, which provides fast, safe and easy access from Gqeberha to Cape Town. The development offers large land parcels (3 000 m² to 10 000 m²). The 50 ha Fountains Industrial Park is part of a 600 ha mixed-use development. The development is zoned and approved for industrial, mixed-use and business use. In addition, the SDF has earmarked

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-107

additional industrial areas to the north and west thereof (Planning Partners, 2024c).

5.7.9.9 Employment Data in the Site Region

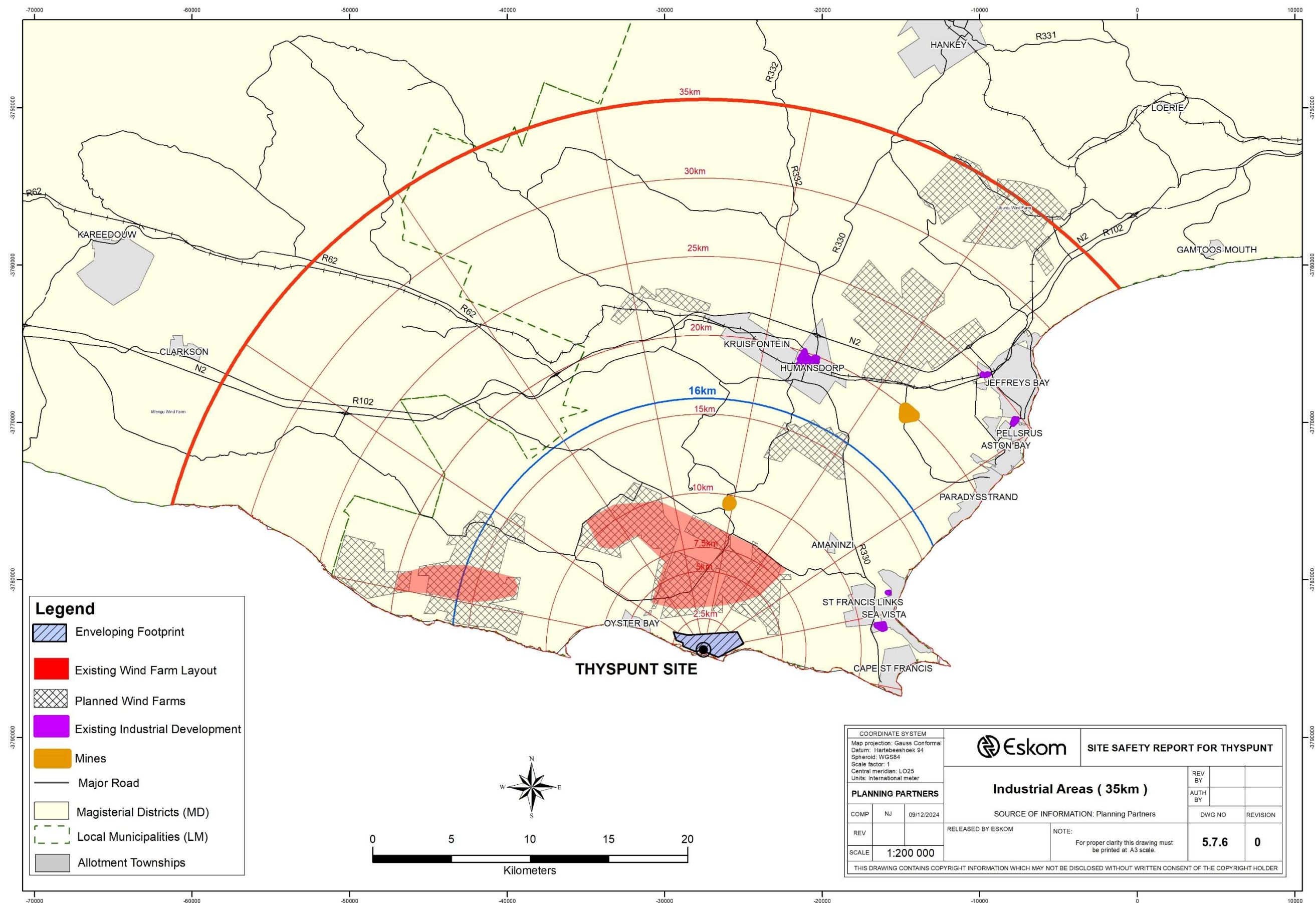
Updated employment figures could not be sourced via a desktop study, and all available data was either dated or relied on Census 2011. Estimations (based on the most recently available period) were then obtained based on data published by Quantec (Pty) Ltd.

Figure 5.7.21 sets out the sectoral employment figures per settlement within the site region as estimated for 2023.

Settlement	Sector										Total
	Agriculture, forestry and fishing	Mining and quarrying	Manufacturing	Electricity, gas and water	Construction	Wholesale and retail trade, catering and accommodation	Transport, storage and communication	Finance, insurance, real estate and business services	General government	Community, social and personal services	
AMANINZI	4	0	0	0	3	2	0	2	0	2	12
ASTON BAY	30	0	28	3	33	164	12	115	11	205	601
CAPE ST FRANCIS	19	0	7	0	8	22	4	16	7	58	142
HANKEY	1 438	1	144	16	182	536	88	260	328	399	3 392
HUMANSDORP	682	2	440	17	233	1 116	116	472	329	1 004	4 411
JEFFREYS BAY	515	1	420	21	496	1 931	178	1 190	338	1 936	7 027
KAREEDOUW	159	0	124	26	105	410	48	142	145	386	1 546
KRUISFONTEIN	364	1	352	16	530	1 106	175	461	364	1 208	4 578
OESTERBAAI	116	0	4	0	26	25	5	28	23	22	248
PARADYSSTRAND	16	0	13	1	6	88	1	24	0	17	167
PATENSIE	916	0	61	22	65	361	40	131	162	259	2 017
PELLSRUS	264	0	175	3	309	1 006	69	446	282	490	3 044
SEA VISTA	175	0	75	7	274	553	35	353	96	386	1 955
CLARKSON	122	0	20	0	91	37	13	40	45	140	508
ST FRANCIS LINKS	0	0	0	0	2	3	0	2	0	4	11
LOERIEHEUWEL	358	0	80	1	83	158	10	48	58	87	885
GAMTOOS MOUTH	9	0	8	0	7	10	2	2	0	4	43

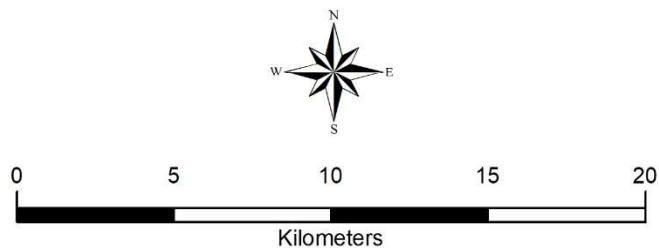
Forecasted based on assumptions from Stats SA Census 2011 and Quantec PTY Ltd.

Figure 5.7.21
Estimated Sectoral Employment Figures per settlement
in the Site Region (2023)



Legend

- Enveloping Footprint
- Existing Wind Farm Layout
- Planned Wind Farms
- Existing Industrial Development
- Mines
- Major Road
- Magisterial Districts (MD)
- Local Municipalities (LM)
- Allotment Townships



COORDINATE SYSTEM		Eskom		SITE SAFETY REPORT FOR THYSPUNT	
Map projection: Gauss Conformal Datum: Hartbeeshoek 94 Spheroid: WGS84 Scale factor: 1 Central meridian: LO25 Units: International meter				REV BY	
PLANNING PARTNERS		Industrial Areas (35km)		AUTH BY	
COMP	NJ	09/12/2024	SOURCE OF INFORMATION: Planning Partners	DWG NO	REVISION
REV			RELEASED BY ESKOM	NOTE: For proper clarity this drawing must be printed at A3 scale.	
SCALE	1:200 000			5.7.6	0
THIS DRAWING CONTAINS COPYRIGHT INFORMATION WHICH MAY NOT BE DISCLOSED WITHOUT WRITTEN CONSENT OF THE COPYRIGHT HOLDER					

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-109

5.7.10 Power Stations, Power-generating Installations and Transmission Lines

Data on power stations, power generation installations and transmission lines were sourced via a desktop study, Eskom strategic documentation, environmental impact reports and site verification.

5.7.10.1 Nuclear Power Stations

There are currently no nuclear power stations located within the site vicinity.

Eskom proposes to construct a nuclear installation(s) at the site with a planned capacity of 4 000 MWe (13 200 MWth), with an eventual total site capacity of up to a maximum power generation of approximately 10 000 MWe (33 000 MWth), assuming a nominal 33 per cent efficiency. The number and design of the reactors are still to be determined but they will be of the Pressurised Water Reactor (PWR) type. Long-term storage of spent fuel would be accommodated on-site in accordance with the practice at the Koeberg Nuclear Power Station, as set out in more detail in **Chapter 3** (Overview of Planned Activities at the Site) (Planning Partners, 2025).

5.7.10.2 Gas Power Generating Installations

There are currently no gas power generating installations located within the site vicinity (Planning Partners, 2025).

5.7.10.3 Wind Power Generating Installations

A number of existing wind farms are located within the site vicinity, namely the Red Cap Kouga Wind Farm, the Gibson Bay Wind Farm and the Oyster Bay Wind Farm. The Banna Ba Pifhu Wind Farm is a proposed windfarm located to the south of Humansdorp (refer to **Figure 5.7.22**).

The nearest wind farm to the site is the Red Cap Kouga Wind Farm, consisting of 32 wind turbines (*Nordex*, 2.5 MWe each), with a combined total power capacity of 80 MWe. The nearest wind turbine is located 3.17 km north-northeast from the site. The wind farm generates approximately 300 GWh of energy per annum, which is sufficient to provide the yearly electricity consumption of approximately 50 000 households.

The Gibson Bay Wind Farm Project consists of 37 wind turbines (*Nordex*

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-110

Delta, 3.0 MWe each), with a combined power generation capacity of 111 MW and is capable of generating approximately 420 GWh per annum, which is sufficient to provide the yearly electricity consumption of approximately 131 000 households.

The Oyster Bay Wind Farm has 41 wind turbines (*Vestas V117*, 3.45 MWe each), with a combined capacity of 140 MWe and an approximate energy production of 568 GWh per year, which is sufficient to provide the yearly electricity consumption of approximately 79 444 households.

The proposed Banna Ba Pifhu Wind Farm located south of Humansdorp has a combined power generation capacity of 30.6 MWe (Planning Partners, 2025).

5.7.10.4 Overhead Transmission Lines and Electricity Substations

There is an existing 22 kV overhead powerline that passes 0.4 km south of the site centroid between St. Francis Bay and Oyster Bay.

Existing 132 kV lines link the wind farms to the broader electrical transmission network. A single overhead 132 kV transmission line running east-west from Oyster Bay windfarm electrical, connects to one of the two north-south trending 132 kV transmission lines that originate at the electrical transmission substation at the Kouga windfarm (See **Figure 5.7.22**). These transmission lines ultimately link to the Jeffreys Bay 132kV transmission substation from where the transmission network is linked to the Grassridge substation north of Gqeberha.

A single overhead 132 kV transmission line links the Gibson Bay substation (See **Figure 5.7.22**) to the 132 kV transmission substation at the Tsitsikamma Community wind farm. From there a single north-east trending overhead 132kV transmission line links into the 132 kV transmission network that culminates at the Grassridge substation, before feeding into the broader 400 kV transmission network from that point.

There is only one Eskom substation located within the site vicinity at St Francis Bay (9.8 km east-northeast) (Planning Partners, 2025)

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-111

5.7.10.5 Future Electricity Generation and Distribution Infrastructure in the Site Vicinity

There are no plans to construct coal power stations within the site vicinity.

There are also no plans to construct gas to-power facilities within the site vicinity (16 km) or the site region (50 km). The nearest planned gas-to-power facility will be located in the Coega Special Economic Zone beyond the site region (95.8 km northeast).

There are currently three wind farms and associated infrastructure planned on adjacent farms near the site. These proposed wind farms are named the Impofu North Wind Farm, the Impofu East Wind Farm and the Impofu West Wind Farm, which are collectively referred to as the Impofu Wind Farms. Note that only the Impofu East Wind Farm is located within the site vicinity, as illustrated in blue in **Figure 5.7.22**.

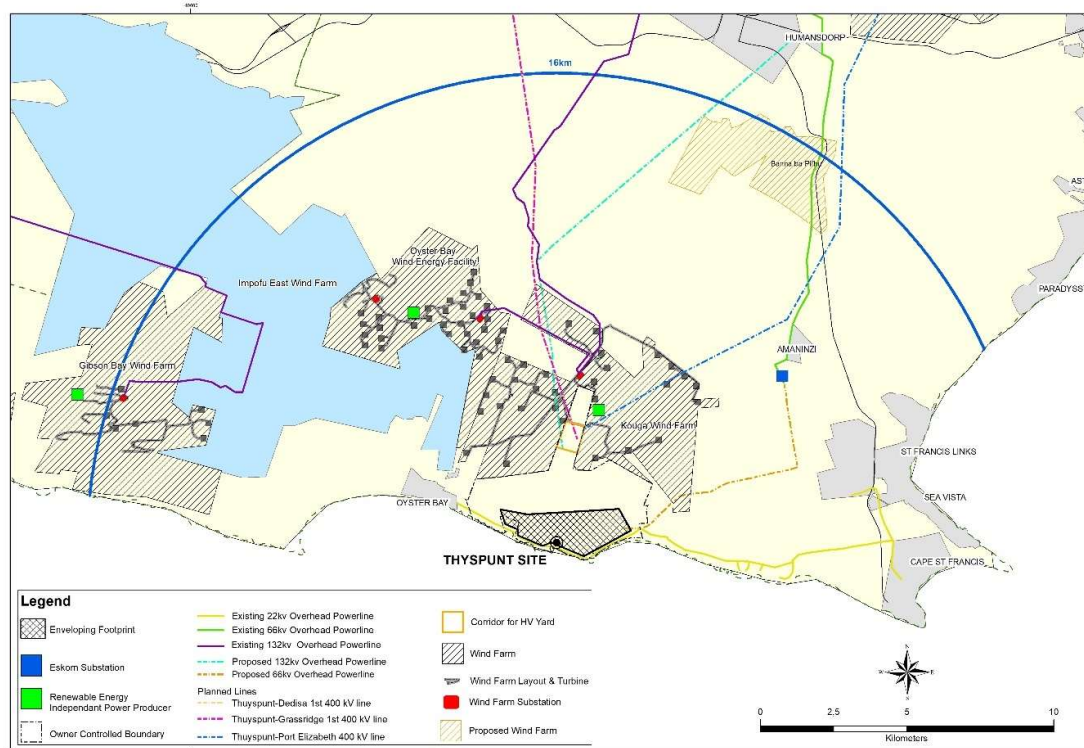


Figure 5.7.22
Wind Farms and Transmission Lines in the Site Vicinity

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-112

The Impofu East Wind Farm is located between the existing Gibson and Oyster Bay wind farms and will consist of 19 turbines (combined generation capacity of 189 MW), power lines and a substation (Planning Partners, 2025).

Eskom was proposing two transmission corridors to link to the Thyspunt nuclear installation(s) to the transmission network: a northern and southern corridor. Both corridors were expected to be utilised by Eskom to distribute a total of 5 × 500 kV lines from the proposed nuclear installation(s). The proposed power lines were to allow electricity generated at the site to be distributed to other parts of the Eastern Cape and South Africa via the transmission grid.

Eskom is currently undertaking grid infrastructure studies that are considering the 2 500MWe / 2 700MW (DMRE) and 5 900MW options. The studies are yet to be completed (Planning Partners, 2025).

The Woodlands Dairy (10.3 km north) has existing solar panels mounted on the warehouse which generates 1.5 GWh per annum. The planned Phase 2 of the project will add an additional 1.65 GWh per annum for their own consumption. The solar system has been designed to be utilised by the dairy and support the diesel generator whilst running on backup power (Planning Partners, 2025).

5.7.10.6 Power Supply to the Site

Transmission lines would be required to supply power during the construction phase, but also to distribute power from the operational power station. The existing 22 kV line that passes 0.4 km to the south of the site can provide approximately 8 MVA of electricity to the site. A new 66 kV line will be required from the St. Francis Bay substation to the site, and it is anticipated that this line will follow the planned eastern access road from St. Francis Bay to the site (Eskom, 2019). A new 132 kV line needs to be provided from the Melkhout substation (approximately 3 km north of Humansdorp) to the high voltage yard (See **Figure 5.7.22**) (Eskom, 2019).

5.7.11 Civil Services and Associated Infrastructure

Water treatment works and associated infrastructure within the site region supply potable water to the population within the region (see **Drawing D-5.7.7**).

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-113

These are potential resources that could be exposed to radiological contamination in the event of a nuclear incident or accident. Should the contaminated water be ingested by the public this could lead to radiological exposure of the population within the region. The site investigation for this TSSR focussed on the urban settlements within the site region.

5.7.11.1 Water Treatment Works (WTW)

Data on WTW were obtained from Kouga Local Municipality and Koukamma Local Municipality. The data were supplemented with DWS published data.

Oyster Bay's water treatment works is a filtration and disinfection plant with a design treatment capacity of 0.8 Mℓ/day. No expansion, but refurbishment of the WTW is currently planned.

The water treatment works at St. Francis Bay WTW is a water oxidation plant with a design treatment capacity of 6 M ℓ/day. A new batch plant with a 6M ℓ/day design capacity is planned.

Humansdorp is served by ground and surface water WTW plant with a design capacity of 8 M ℓ/day. The Kruisfontein WTW is a groundwater oxidation plant serving Humansdorp and Kruisfontein with a design capacity of 0.8 M ℓ/day, with a new batch plant with a design capacity of 3.5 M ℓ/day to be completed in the 2024/2025 financial year.

Jeffreys Bay is also served by a ground water WTW with a design capacity of 10.5 M ℓ /day.

Hankey is served by a ground and surface WTW with a design capacity of 8 M ℓ/day.

Patensie is served by a surface WTW with a design capacity of 0.9 M ℓ/day. There are currently no planned upgrades to the WTW (Kouga Municipality, 2024).

The Kareedouw WTW has a design capacity of 2.35M ℓ/day. The Clarkson WTW has a design capacity of 0.36M ℓ/day (Koukamma Local Municipality, 2024).

The Loerie WTW has a peak capacity of 100Mℓ/day and an average capacity of 63Mℓ/day.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-114

The Elandsjacht WTW has a design capacity of 105 Mℓ/day.

Current groundwater use of towns in the Kouga Local Municipality is estimated at 8.2 Mℓ/day, based on recommended yields and measured yield (Department of Water and Sanitation, 2023).

The WTW within the 35 km radius are presented in **Drawing 5.7.7**.

The location and distribution of water treatment works within the site region are set out in **Table 5.7.18**, which provides the name, distance and direction of water treatment works.

Table 5.7.18
Water Treatment Works in the Site Region

Code	Name	Distance (km)	Direction
W1	Oyster Bay WTW	4.88	WNW
W2	Elandsjagt WTW	14.51	NNW
W3	Humansdorp WTW	19.73	NNE
W4	Clarkson WTW	21.82	W
W5	Jeffreys Bay WTW	26.64	NE
W6	Churchill WTW	27.11	NW
W7	Hankey WTW	42.53	NNE
W8	Kareedouw WTW	45.47	NW
W9	Loerie WTW	47.10	NE
W10	Patensie WTW	48.20	NNE
W11	Woodlands WTW	48.88	WNW

5.7.11.2 Wastewater Treatment Works (WWTW)

Data were obtained from Kouga Municipality and supplemented with DWS published reports.

Oyster Bay does not have a waterborne sewage system and is served by a septic tank system.

Cape St. Francis and St. Francis Bay are served by a sequential batch reactor WWTW with a treatment capacity of 2 M ℓ /day.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-115

Humansdorp and Kruisfontein are served by two activated sludge WWTW with a treatment capacity of 1.25 and 2.5 Mℓ /day. There is a water re-use scheme in place, where treated effluent is used for irrigation purposes.

Sewage from Jeffreys Bay is served by activated sludge and oxidation ponds WWTW with a combined treatment capacity of 8 M ℓ/day. There is a water re-use scheme in place, where treated effluent is used for irrigation purposes.

Hankey is served by a sequential batch reactor WWTW with a treatment capacity of 1.8 M ℓ/day. Patensie also uses this WWTW for its effluent.

Thornhill is served by a sequential batch reactor WWTW with a treatment capacity of 1.8 M ℓ/day.

Loerie is served by a pond system WWTW with a treatment capacity of 20 k ℓ/day (Kouga Municipality, 2024).

The Clarkson WWTW has a design capacity of 0.33 M ℓ/day and the Kareedouw WWTW has a design capacity of 0.75 M ℓ/day. Based on the 2022 DWS Green Drop assessment, the DWS noted some major concerns including the vandalised and non-functional WWTWs and pumping stations (Department of Water and Sanitation, 2022).

Table 5.7.19 sets out the name, distance and direction of wastewater treatment works in the site region.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-116

Table 5.7.19
Wastewater Treatment Works in the Site Region

Code	Name	Distance (km)	Direction
WW1	Loerie WWTW	46.37	NE
WW2	Patensie Prison WWTW	42.69	NNE
WW3	Kareedouw WWTW	48.56	NW
WW4	Hankey WWTW	41.38	NNE
WW5	Die Blaar (Clarkson) WWTW	40.71	WNW
WW6	Clarkson WWTW	38.86	WNW
WW7	Jeffrey's Bay WWTW	23.74	NE
WW8	Humansdorp WWTW	17.02	NNE
WW9	Kruisfontein WWTW	16.49	NNE
WW10	St. Francis Bay WWTW	12.40	E

The WWTW within the 35 km radius are presented in **Drawing 5.7.7**.

5.7.11.3 Solid Waste Facilities

The Kouga Municipality has adopted and integrated a waste management plan and waste disposal by-laws have been promulgated.

Solid waste is deposited at registered sites in Hankey and in Humansdorp, while drop-off zones have been established at Jeffreys Bay, St. Francis Bay and Oyster Bay (Kouga Local Municipality, 2021a).

5.7.11.4 Telecommunication Infrastructure

Telecommunications infrastructure was identified for a 35 km radius. The area includes the nearest main urban settlements of Humansdorp and Jeffreys Bay. For the purpose of this subsection, data were collected on the total number of subscribers and infrastructure, as this information may become important in the event that density thresholds are exceeded.

Related data are also required for the purpose of defining stationary sources of external hazard within 16 km of the site.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-117

Telkom Infrastructure

The telephone exchange data were obtained for this area, together with the total number of subscribers and the number of subscribers within the specified radius. This information is summarised in **Table 5.7.20** and illustrated in **Drawing 5.7.7**.

Table 5.7.20
Telephone Exchanges (2008)

Exchange	Distance (km)	Direction	Number of Subscribers	
			Total	Cumulative Number within 35 km Radius
T1 - Oyster Bay	5.04	WNW	79	79
T2 – St. Francis Bay	11.58	ENE	1 431	1 510
T6 - Humansdorp	18.80	NNE	2 800	4 310
T7 - Aston Bay	22.12	ENE	644	4 954
T8 - Jeffreys Bay	24.75	NE	2 508	7 462
T9 - Wavecrest	26.87	NE	2 398	9 860

Telkom has two microwave towers installed within a 35 km radius from the site. These are indicated in **Table 5.7.21** and illustrated in **Drawing 5.7.7**. These microwave towers are installed at the same locations as the exchange buildings for the mentioned sites. The Oyster Bay microwave tower is located 5.04 km west-northwest of the site and the Humansdorp microwave tower is located 18.80 km north-northeast of the site.

Table 5.7.21
Microwave Towers (2008)

Microwave Tower	Distance (km)	Direction
T1 - Oyster Bay	5.04	WNW
T4 - Humansdorp	18.80	NNE

One radio tower has also been installed within a 35 km radius of the site. The Humansdorp radio tower is located 19.43 km north-northeast of the site (see **Table 5.7.22** and its location is illustrated in **Drawing 5.7.7**).

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-118

Table 5.7.22
Radio Towers (2008)

Radio Tower	Distance (km)	Direction
T5 - Humansdorp DECT	19.43	NNE

Two Telkom Street cabinets are also located within the 35 km radius from the site. They are presented in **Table 5.7.23** and their location is illustrated in **Drawing 5.7.7**.

Table 5.7.23
Street Cabinets (2008)

Street Cabinets	Distance (km)	Direction	Number of Subscribers	
			Total	Number within 25 km Radius
T3 - Cape St. Francis Shelter DLUB 700	11.70	E	213	213
T6 - Kruisfontein Shelter DLUB 400	20.44	N	127	127

Telkom has an underground optic-fibre route, as well as an overhead optic-fibre route, located 17 km north of the site (see **Drawing 5.7.7**). The underground optic-fibre route originates in the vicinity of Humansdorp and stretches eastwards to Jeffreys Bay. From Jeffreys Bay, the network branches southward to Aston Bay.

The overhead optic-fibre cable originates from Humansdorp and stretches south and terminates at St. Francis Bay. An underground optic-fibre cable then continues from St. Francis Bay southwards to Cape St. Francis. The overhead, as well as the underground optic-fibre cables, continue westward from Humansdorp and further north (Eskom, 2015a). The layout of the overhead and underground optic-fibre routes is illustrated in **Drawing 5.7.7**.

Cellular Communication Base Stations

The cellular communication network related telecommunication base stations that occur within the 35 km radius is presented in **Table 5.7.24**. The location of the cellular base stations is also shown in **Drawing 5.7.7** (Eskom, 2015a).

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-119

**Table 5.7.24
Cellular Base Stations (2008)**

Code	Provider	Site Name	Direction	Distance (km)
C1	Telkom	Oyster Bay	WNW	5.02
C2	Vodacom	St Francis Bay	E	10.83
C3	Vodacom	Cooper House MC1	E	11.84
C4	Vodacom	Cape St Francis Resort MC1	E	12.12
C5	Vodacom	St Francis Drive	ENE	12.50
C6	Transtel	Cape St Francis	ESE	12.51
C7	Vodacom	Port of St Francis MC1	E	13.89
C8	Telkom	Gill Marcus Dect	NNE	19.44
C9	MTN	Humansdorp Water Reservoir	NNE	19.58
C10	Cell C	Humansdorp	NNE	19.62
C11	Vodacom	Humansdorp	NNE	20.27
C12	Vodacom	Paradise Beach	ENE	20.54
C13	Vodacom	Paradise Beach	ENE	21.47
C14	MTN	Happy Valley	NNW	21.83
C15	Vodacom	Kerkplaas	NNW	23.61
C16	Vodacom	Marina Martinique	ENE	23.98
C17	MTN	Jeffreys Bay Beach	NE	25.40
C18	Vodacom	Time Square	NE	25.42
C19	CellC	Jeffreys Bay Golf Course	NE	25.51
C20	Vodacom	Jeffreys Bay	NE	25.87
C21	Vodacom	Ozzies	NE	26.85
C22	Telkom	Wavecrest	NE	26.85

Radio and Television Transmitters

Radio and television transmitters were also identified for a 35 km radius. There are no radio or television transmitters within the 35 km radius.

The nearest transmitter to the site is located at Gqeberha (73.77 km east-northeast). This transmitter is located approximately 90 km from the site (see ***Drawing 5.7.7***). It transmits RSG, SAFM, R2000, LOBO, 5FM, METRO FM, LOTUS FM and RADIO ALGOA, as well as SABC 1, 2, 3, eTV and MNET.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-120

Sentech controls the radio and television transmitters in the region (Eskom, 2015a).

5.7.12 Military Facilities and Activities

The location and activities associated with military facilities within the site region were determined in order to identify potential sources of external human induced events and to support the feasibility of the emergency planning.

5.7.12.1 Military Airfields and Bases

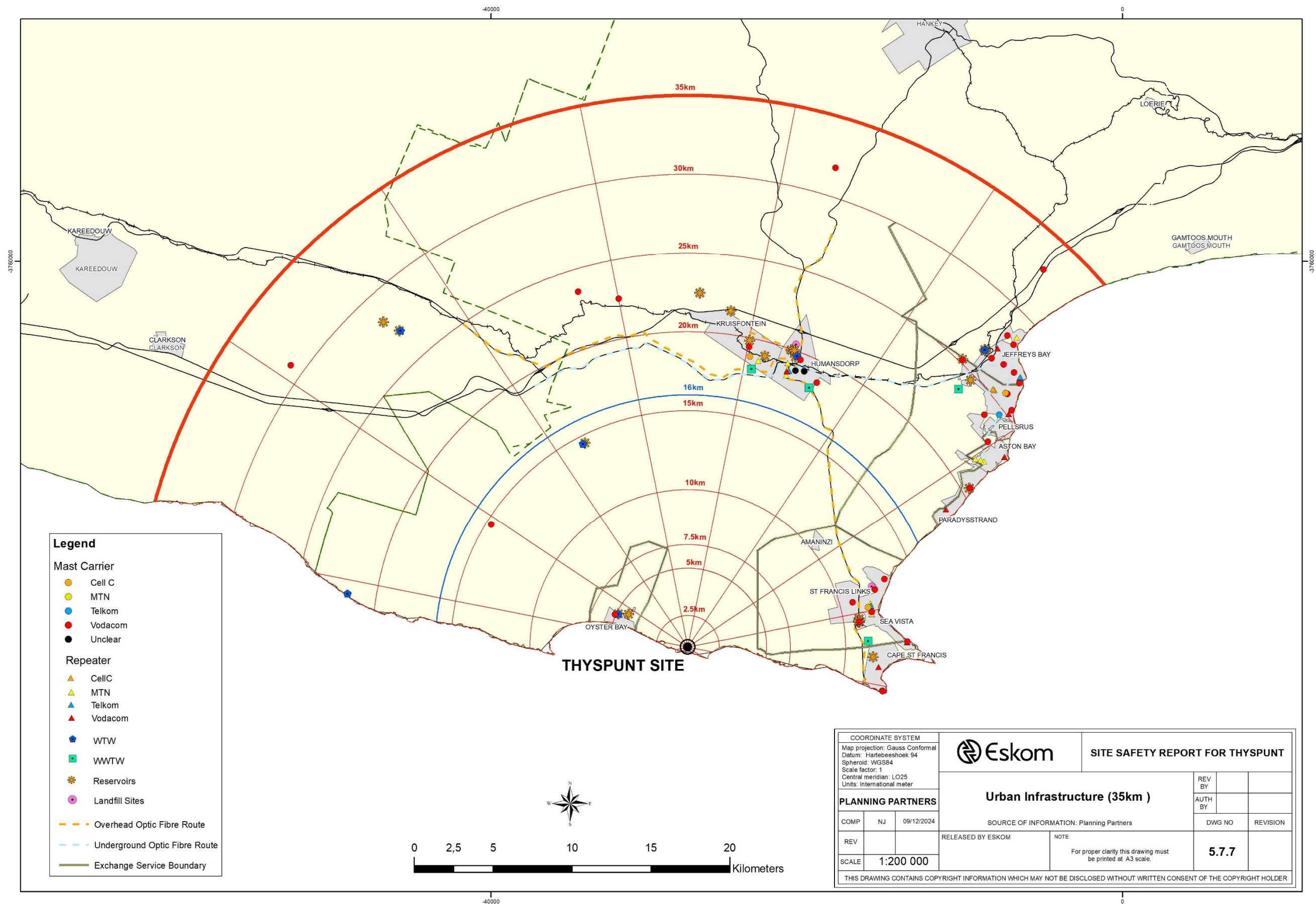
The closest military air force base is the Air Force Station Port Elizabeth. It is co-located and shares the runways with CDSCIA which is 85 km to the east-northeast of the Thyspunt site. The air force base was downgraded in the early 1990s to an air force station. Main operations at the station include coastal recce flights and command and control in crime prevention operations in co-operation with the police and national defense force (South African Air Force, 2024).

5.7.12.2 South African Navy Facilities

Currently there are no naval facilities within the site region. The South African Navy has a naval station at the Port of Gqeberha/Port Elizabeth (beyond the site region) but does not maintain any ships at this station. The previous military rifle range at this location is no longer in use and no ammunition is stored at this naval station. The navy is empowered to protect the South African waters and coastline. It can, therefore, be assumed that navy boats patrol the coast and pass the site from time to time.

5.7.12.3 Future Military Facilities

No future planned military facilities within the site region are currently known.



	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-122

5.7.13 Storage of Hazardous Substances within the Site Vicinity

Stored and transported hazardous substances in the site area were evaluated for the purpose of this SSR and the results are presented in this section. The investigation focused on the site vicinity and potential sources of risk located within 16 km of the site in accordance with international best practice. Sources of hazards that may originate further afield, but are transported through the area, were also considered.

5.7.13.1 Hazardous Materials Stored in the Site Vicinity

Stationary sources of external hazards were determined within 16 km of the site. Such sources of external hazard are associated with potentially explosive, incendiary or toxic substances that are stored or occur within this area.

5.7.13.2 Industrial Areas

St. Francis Bay has a small industrial area (11.36 km east), which is the only industrial area within the site vicinity. The industrial area is characterised by small service-related industries.

Data on flammable liquids stored in the site vicinity were obtained from Kouga Municipality for the businesses located in the St. Francis Bay industrial area.

[REDACTED]

[REDACTED]

[REDACTED] Redacted

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-123

 × 20 t for
ar fertilizer
(Planning
Partners, 2024d).

5.7.13.3 Service Stations

There is only one service station situated within 16 km of the site, the Astron Energy Fuel Station. It is located at St. Francis Bay, 12.66 km east-northeast of the site.

 (Planning
Partners, 2024d).

5.7.13.4 Mining Activities, Brickfields and Coal Burning Facilities

There is only one coal-burning facility within the site vicinity. The nearest facility to the site is the Langkloof Bricks, which is located 15.25 km northeast. It uses between 1 000 t and 1 500 t of spiral/duff coal per month, with a bunkered volume of less than 500 t at any given time, as well as 30 t of small nuts coal.

The investigation into mining activities in the site vicinity found that the Department of Mineral Resources and Energy (DMRE) lists seven operational mines within the site vicinity. They are predominantly aggregate and sand mines, with one clay and shale mine. They are relatively small operations, directly related to the construction industry. These operations could involve the use of commercial explosives however the exact substances and amounts are not known. These operations tend to change location as resources become depleted and new sources become known. The seven mines and their activities are:

- M1: Thyspunt (2.83 km north-northwest) is the nearest mine to the site and mines aggregate and natural sand;
- M2: Supacrush (5.95 km northwest) mines aggregate and natural sand;
- M3: Oesterbaai-Eastern Cape (6.69 km north) mines aggregate and natural sand;
- M4: Lavender Hill Sand (8.53 km east-northeast) mines natural

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-124

sand;

- M5: Wahloo (9.49 km northeast) mines natural sand;
- M6: Green Agri Trust (11.36 km north-northwest) mines natural sand;
- M7: Kouga Bricks CC (15.25 km north-northeast) mines clay and shale (Planning Partners, 2024d).

5.7.13.5 Wastewater and Water Treatment Works

The following water treatment works (WWTW) use hazardous substances to treat water:

- Oyster Bay WWTW (4.88 km west-northwest), which stores 210 kg of chlorine gas on-site.
- Humansdorp WWTW (14.51 km north-northwest), which stores 210 kg of chlorine gas on-site.

There is only one wastewater treatment works (WWTWs) within the site vicinity at St. Francis Bay WWTW (12.40 km east), which stores 210 kg of chlorine gas on-site (Planning Partners, 2024d).

5.7.13.6 Hazardous Waste Sites

There was a waste disposal site within the site vicinity, located at St. Francis Bay (13.27 km east-northeast). However, this facility is no longer operational. The Kouga Local Municipality Integrated Waste Management Plan (KLM IWMP, 2015) states that a closure permit has been secured, but the site has not been rehabilitated.

The nearest operational waste disposal site to the Thyspunt site is the Humansdorp Landfill (18.71 km north-northeast), which falls outside of the site vicinity. Neither landfill stores hazardous waste. The permits issued for both landfills were for general waste only (Planning Partners, 2024d).

5.7.13.7 Fertiliser on Farms

As part of an agricultural production survey conducted in 2024, data was collected on fertilizer used and stored on the farms within the site vicinity.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-125

Redacted

Redacted of fertiliser were delivered, stored or used at any given time within the site vicinity. A summary of fertiliser delivered to farms within the site vicinity is presented in **Appendix 5.7.A**. The appendix lists each farm, with the type and average volumes of fertiliser stored annually (Planning Partners, 2024d).

5.7.13.8 Summary of Hazardous Material Stored in the Site Vicinity

A summary of the hazardous materials stored within the site vicinity is presented in **Table 5.7.25**.

Table 5.7.25
Summary of Hazardous Materials Stored within the Site Vicinity (2024)

Substance	Inventory	Facility/ Location	Distance (km)	Direction
Petrol	46 000 ℓ	Astron Energy, St. Francis Bay	12.66	ENE
	23 000 ℓ	Port of St. Francis	13.87	E
Diesel	30 000 ℓ	Astron Energy, St. Francis Bay	12.66	ENE
	56 000 ℓ	Port of St. Francis	13.87	E
LPG	862 kg	St. Francis Bay	11.70	E
	984 kg	St. Francis Bay	12.24	E
	2 509 kg	St. Francis Bay	12.36	E
	150 × 9 - 48 kg	Port of St. Francis	13.87	E
Acetone	400 ℓ	St. Francis Bay	11.94	ENE
Paraffin	200 ℓ	St. Francis Bay	11.94	ENE
Chlorine Gas	210 kg	Oyster Bay WTW	4.88	WNW
	210 kg	St. Francis WWTW	11.43	E
Turpentine	50 × 5 ℓ and 50 × 750 ml	St. Francis Bay	12.24	E

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-126

Substance	Inventory	Facility/ Location	Distance (km)	Direction
Thinners	50 × 5 ℓ and 50 × 75 ml	St. Francis Bay	12.24	E
Polyester Resin	500 ℓ	St. Francis Bay	11.94	ENE
Fertiliser	9 356.16 t	Farms located within the site vicinity	0.0 to 16.0	W to ENE

5.7.13.9 Hazardous Substances Expected to be Stored at the Thyspunt Site

The volumes of the expected bulk chemicals expected to be used and stored on the site by the new nuclear installation(s) have not been defined as yet and will be considered in the Safety Analysis Report (SAR) for new nuclear installation(s) in the next licensing stage. However, based on the consistent Environmental Impact Assessment (EIA) data set (see [Appendix 5.7.A](#)) and assuming a 30-day supply with standard tanks, the preliminary expected bulk chemical inventories were estimated and are presented in [Table 5.7.26](#). These bulk chemical inventories will need to be calculated once the engineering design for the nuclear installation(s) is in an advanced state (Eskom, 2020).

Table 5.7.26
Bulk Chemicals Expected to be Stored at the Site

Component	Inventory	Notes
Chlorine	5 × 100 t	EIA consistent data set and assumed 30-day supply (cleaning of water)
Diesel	3 × 230 m ³	EIA consistency data set
Hydrogen	8 × 30 Nm ³	EIA consistency data set
Petrol	1 × 23 m ³	Standard size underground tank
Sulphuric Acid	20 m ³	Assumed
Caustic	10 m ³	Assumed to be delivered as caustic flakes
Ammonia	2 × 2 t	Assumed
Sodium Hypochlorite	12 m ³ /annum	Assumed

The total inventory of bulk hazardous chemicals expected at the site presented in this TSSR is preliminary. It includes materials expected to be generated or stored at the site. It is also based on assumptions of the

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-127

consistent EIA data set and the KNPS experience (2 × 900 MWe). The final inventory of hazardous materials to be stored or to occur on-site still needs to be finalised prior to nuclear installation(s) construction (Planning Partners, 2024d).

5.7.14 Hazardous Substances Transported in the Site Vicinity

Hazardous substances transported in the site vicinity were evaluated and the results are presented in this section. The investigation focused on potential sources of risk transported in the site vicinity and the approach to areas of investigation described in **Subsection 5.7.4.1**. Sources of hazard which may originate further afield but are transported through the site vicinity were also considered.

5.7.14.1 Transportation by Road and Rail

The information discussed in this section was obtained from a survey of the major chemical suppliers and transport contractors operating in the site vicinity carried out in 2024. Chemical loads transported through the site vicinity invariably consist of a variety of chemicals delivered to different customers within this area.

Bulk chemicals transported from Gqeberha and the Port of Ngqura to the Southern Cape and Western Cape will mostly likely make use of the N2 Freeway (19.40 km, northwest), which is beyond the site vicinity, as it is the main transportation route along the south coast.

Transportation of hazardous substances from Gqeberha to customers located in or near Cape St. Francis and St. Francis Bay will most likely use the R330 (11.10 km, east), being the main road that leads to the site vicinity (Planning Partners, 2024e).

Petroleum, Diesel and Liquified Petroleum Gas (LPG)

Delivery of petroleum, diesel and LPG products to customers within the site vicinity is done by the companies' own fleet or by contracted freight companies. The R330 Road is the most frequently used route, with the bulk of the products destined for the Astron Energy service station, located in Assisi Drive in St. Francis Bay. Fuel is transported to the Astron Energy service station once a week during off peak season and twice a week during peak season (December to January). The maximum volume transported is 25 000 l. The main route used for the transportation is the

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-128

R102 at Humansdorp and onto the R330 road to St. Francis Bay.

As the Thyspunt nuclear installation project is still in its initial planning stages, there are no data or records indicating existing volumes of petrol, diesel or LPG being transported to the site.

Currently, no new planned service stations within the site vicinity are known (Planning Partners, 2024e).

Other Chemicals

Delivery of other hazardous substances takes place on demand and therefore varies according to customer demand. Detailed information on the frequency and volumes of these substances can therefore not be provided (Planning Partners, 2024e).

Explosives

The transport of all explosives, other than for military use, requires a license from the SAPS Chief Inspector of Explosives (Eastern Cape). The SAPS Commander: Explosives Control has confirmed that no explosives are known to be transported within the site vicinity.

The Commander: Explosives Control has also confirmed that any quantity of explosives transported will be within the prescribed, regulated limits to be transported. Several other protocols are in place, such as the blasting record prescribed by relevant regulations (Republic of South Africa, 2004) (Republic of South Africa, 2003), to ensure proper control over these explosives. The Commander has assured that any permitted transportation of explosives will not create any danger to a National Key Point, such as Thyspunt.

Before permits are issued, the blasting company must provide a blast plan and when any blasting is intended within 500 m of any other institution's property, such as overhead power lines, Telkom line etc., consent letters from such an institution must be provided and also written consent must be obtained from the local authority's Chief Inspector of Occupational Health and Safety (Republic of South Africa, 2003) (Planning Partners, 2024e).

Fertilizer

As part of an agricultural production survey that was undertaken in 2024

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-129

within the site vicinity, farm owners and managers were asked to report on fertilizer used and stored on the farms within the site vicinity. The survey revealed that farms receive and store fertilizer on-site. Fertilizer is transported from suppliers via the roads serving the farming community and delivered directly to the farms.

5.7.14.2 Transportation by Marine Vessels

A release of oil at sea can result from shipping incidents caused by collisions at sea between two vessels or hull failure due to heavy weather or the grounding of vessels on offshore reefs or on the coastline. The risk of these occurrences is linked to the proximity of the nuclear installation(s) to vessel traffic zones.

The site is situated adjacent to the main vessel traffic routes for vessels moving from both east-west and west-east around the tip of Africa. The South African Notice to Mariners (No. 5 of 2008) defines tanker traffic separation schemes with:

- westbound traffic distance of 20 nmi off certain capes (which relates to approximately 34 km off the coast from the site);
- eastbound traffic distance of 25 nmi off certain capes (which relates to approximately 44 km off the coast from the site).

The relevant shipping lanes are illustrated in **Drawing 5.7.5** which shows the nearest shipping lane passing 37.1 km south of the site.

According to the British Petroleum (BP) Statistical Review of World Energy about 225.8×10^6 t of crude oil were transported westbound and 101×10^6 t were transported eastbound around South Africa during 2007. These quantities of crude oil passed along the traffic separation zones off the site as described above. In 2019, the BP Statistical Review of World Energy reported that 109.7×10^6 t of crude oil were transported around South Africa (BP, 2020).

In 2016, 5.8 million barrels per day of total oil (crude oil and refined products) transited the Suez Canal in both directions (US Energy Information Administration, 2024). Theoretically these oil movements could pass the Cape of Good Hope, should the Suez Canal be closed.

In particular, disruptions to the Bab el-Mandeb or Suez Canal force ships

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-130

to take a much longer route around the Cape of Good Hope along Africa's southern end. This longer route from the Persian Gulf to northwestern Europe nearly doubles the travel time and increases freight rates and shipping costs. In mid-November 2023, Houthi rebel groups from Yemen began to attack ships around the Bab el-Mandeb Strait and in the Red Sea. Initially, these attacks affected mostly container ships transporting non-energy goods. However, as the attacks have escalated, more oil and LNG vessels are avoiding the Bab el-Mandeb and Suez Canal route and are traveling the longer route around Africa (U.S. Department of Energy, 2024).

Marine vessels are expected to carry their own bunker fuel for their own propulsion. Typical volumes of bunker fuels carried by these large vessels off the coast of the site are presented in **Table 5.7.27**.

Table 5.7.27
Vessel Types and Typical Fuel Volumes Carried

Vessel Type	Typical Fuel Volumes Carried (t)
Bulk Carrier	4 000 to 7 000 t
General Cargo Vessel	± 3 000 t
Tanker	4 000 to 7 000 t
Container Vessel	5 000 to 11 000 t

Ships travelling past the site may carry hazardous substances that may pose a threat to the nuclear installation(s). These substances could include liquefied flammable gas, ammonia, ammonium nitrate, LPG/Propane, petroleum and crude oil. The amount of substance is determined by the ship type, which is custom-built for each owner. Each tank of these ships is required to have a number of design safety measures to prevent fires and explosions. These measures include tank washing, and pressure/vacuum and relief valves (Riscom, 2012).

5.7.14.3 Transportation by Aircraft

In considering hazardous substances transported by air, the investigation identified and characterised all aircraft types that would pass in or near the site vicinity. The major hazard to the proposed nuclear installation(s)

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-131

would entail the aviation fuel onboard. **Table 5.7.6** in **Subsection 5.7.5.1** provides the types and frequency of aircraft that fly within the 50 km radius of the site (arrive and depart at CDSIA), as well as the typical volume of aviation fuel carried per aircraft type.

A major hazard to the proposed nuclear installation(s) would be the aviation fuel onboard. **Appendix 5.7.B** provides the type and frequency of flights that pass the site, as well as the key specifications of each aircraft.

5.7.14.4 Transportation by Pipeline

Existing Pipelines

There are no pipelines in the site vicinity.

Future Pipelines

There are no pipelines planned within the site vicinity.

As part of a national liquid natural gas pipeline system project commissioned by the National Department of Environmental Affairs, National Department of Energy and National Department of Public Enterprises, as well as iGas, Eskom and Transnet, Redacted

Redacted Redacted Redacted These gas pipelines will provide gas to various consumers along the coast and a gas-to-power station located in the Coega Industrial Development Zone. Note that these gas pipeline corridors are located beyond the site vicinity.

Redacted Redacted (see **Figure 5.7.23**) (Planning Partners, 2024e).

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-132



Figure 5.7.23
Extract of Transnet National Pipeline Network

5.7.14.5 Summary of Hazardous Materials Transported Past the Site or in the Site Vicinity

Table 5.7.28 summarises the hazardous substances being transported past the site.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-133

Table 5.7.28
Summary of Hazardous Materials Transported past the Thyspunt Site (2024)

Component	Destination Source	Transport Route	Inventory (ℓ, kg or t)	Frequency (daily, weekly, monthly, per year)
Petroleum	St. Francis Bay Astron service station and St. Francis Bay NSRI	R330	Re dac ted	Weekly
Diesel	St. Francis Bay Astron service station	R330		Weekly
LPG	St. Francis Bay Astron service station	R330		Weekly
Explosives (civil use)	Roadworks	R330		Irregularly
Crude Oil	Eastbound, including Port of Gqeberha/Port Elizabe	20 nmi westbound		Annually
Crude Oil	Westbound	25 nmi eastbound sea traffic route		Annually

5.7.14.6 Hazardous Substances Expected to be Transported to and from the Thyspunt Site

An evaluation of impacts of potential sources of human-induced origin was previously conducted for the site in November 2008. This study identified the potential for the transportation of hazardous materials such as chlorine, ammonia and fuels to the site, in particular along the R330 road (see **Drawing 5.7.3**) and the proposed alternative access routes to the site as illustrated in **Drawing 5.7.4**. The evaluation estimated the frequency and load size of bulk chemicals expected to be transported to the site. The evaluation is based on the consistent EIA data set presented

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-134

in **Appendix 5.7.A** and the KNPS experience (Planning Partners, 2024e). The estimated road transport frequencies of these hazardous materials are summarised in **Table 5.7.29**.

Table 5.7.29
Estimated Road Transport Frequencies of Hazardous Chemicals to Thyspunt

Component	Annual Consumption	Transport Route	Transport Frequency per Year
Chlorine (t)*	5 275.70	R330 and via Alternative Access Routes illustrated in Drawing D-5.7.3	530 × 10 t
Diesel (m³)**	264.00		14 × 20 m³
Hydrogen (Nm³)*	262 800.00		Produced on site***
Petrol (m³) **	169 325.00		9 × 20 m³
Sulphuric Acid (t)**	285.62		16 × 18 t
Caustic (t)**	139.40		Assumed to be delivered as caustic flakes
Ammonia (t)**	36.00		18 × 2 t

* Data set values consistent with EIA (2008) (see **Appendix 5.7.A**)

** 2007 consumption at the KNPS Units 1 and 2.

*** May need to be transported to or around the site and is therefore included in the list of hazardous chemicals transported to the site.

The final inventory of hazardous materials to be transported to the site will need to be reviewed, updated and finalised in revisions of the SSR, and include reference to the number of nuclear installation(s) to be constructed on the site once confirmed.

5.7.15 Main Activities Relevant to Nuclear Installation Safety

Activities relevant to nuclear installation safety fall into two main categories: (i) external human-induced events that could pose a threat to the nuclear installation(s) and (ii) infrastructure that is necessary for emergency planning.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-135

External human-induced events include aircraft hazards, road and rail hazards, shipping hazards, pipeline hazards, external fires, electromagnetic interference, radiological hazards, high energy rotating equipment and hazardous substances stored or transported near the nuclear installation site.

The following subsections discuss the external hazards that were identified which could pose a threat to nuclear installation safety (see **Drawing 5.7.8**).

5.7.15.1 Identification of Sources of Potential External Hazards

The evaluation and characterisation of potential sources (stationary and mobile) of hazards in the site vicinity were conducted for the purpose of this TSSR. The basis of the evaluation is the characterisation of nearby transportation, industrial and military facilities and activities presented in this subsection. The evaluation also focused on the identification of potential external hazards associated with nearby industrial, transportation and military facilities, as well as accident statistics and their consequences.

The evaluation of the potential hazardous events relevant to the planned nuclear installation(s) on the site is provided in **Chapter 6**.

a) Aircraft Accidents

Aircraft incidents¹¹ and accidents¹² within an 80 km radius from the site were investigated for the January 2008 to December 2023 period¹³. The period was selected to provide data from the TSSR Rev. 0 to date. Aircraft accidents associated with the CDSIA and Uitenhage Airfield were also recorded. The historical data available are presented in **Appendix 5.7.D** and demonstrate that:

- all aircraft accidents and most incidents involved light aircraft and helicopters;

¹¹ An aircraft incident is any event where minor damage is caused to an aircraft and without fatalities

¹² An aircraft accident is an event where major damaged is caused to the aircraft or fatalities are recorded

¹³ According to Byrne, JP (1997) The Calculation of Aircraft Crash Risk in the UK, Contract Research Report 150/1997, Health and Safety Executive (HSE) 1997 suggests 10 years for the reasons given in the reference, since a short period gives insufficient data and a longer period gives outdated information.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-136

- no incidents or accidents occurred within the flight corridors over the site for the recorded period.

As stated earlier, the only airfield situated within 16 km of the site is the St. Francis Airfield (10.8 km east), which does not accommodate routine, commercial flights. It has been confirmed that no accidents have occurred at the airfield over the last 10 years.

Data were collected on drone incidents in the site region, for the 2017 to September 2024 period (± 8 years). The data were obtained from the SACAA, who became the regulatory body on unmanned aerial vehicles (UAS) on 1 July 2015. In terms of regulations published in 2015 incidents involving drones must be reported to the SACAA where there is:

- injury or death of a person;
- damage to property;
- destruction of the UAS beyond economical repair

For the period investigated there were no reported drone incidents in the site region (Planning Partners, 2024g). The evaluation of external events considers aircraft accidents and is dealt with in detail in **Chapter 6**, which sets out the results for Accident Analysis for Aircraft Crash into Hazardous Facilities.

b) Road Accidents

Road traffic accidents on the road infrastructure surrounding the site were determined for the November 2006 to June 2008 period (Eskom, 2015). The investigation covered an area up to the major east-west route, the N2 Freeway (see **Drawing 5.7.3**) which represents the closest regional transport route in the site region. At present, data related to road accident statistics in the Eastern Cape is not readily available. Therefore, in the absence of official accident statistics for the Eastern Cape Province data were compiled from primary accident reports at various police stations within the site region. A summary of the collected data is presented in **Table 5.7.30**. It has not been possible to obtain updated data from the Eastern Cape Roads Authority, for the purpose of this update and historic data is therefore presented.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-137

The analysis of the available data showed that 45 per cent of the recorded accidents occurred on the N2 Freeway, the major distributor in the region. This national road is characterised by high volumes of regional traffic and is located more than 16 km to the north of the site.

The R330 between Humansdorp and Cape St. Francis and the R102 between Humansdorp and Jeffreys Bay have the second highest number of accidents; 24 per cent each. The R62 and the R332 constitute three and four per cent of traffic accidents, respectively (see **Table 5.7.30**).

Heavy commercial trucks constitute five per cent of all accidents recorded to date. Only two accidents with heavy commercial trucks were recorded on the R330 road, which passes within 16 km of the site. Other accidents that involved trucks occurred on the N2 (2), the R102 (3) and the R332 (1) for the period November 2006 to June 2008, as presented in **Table 5.7.30**.

Table 5.7.30
Accident Data Recorded for the 35 km Radius around the
Thyspunt Site (November 2006 to June 2008)

Vehicle Type	Roads and Intersection										Total	
	N2	Total Road Accidents (Per Cent)	R330 Road	Total Road Accidents (Per Cent)	R102 Road Outside 16 km	Total Road Accidents (Per Cent)	R62 Road Outside 16 km	Total Road Accidents (Per Cent)	R332 Road Outside 16 km	Total Road Accidents (Per Cent)	No.	Per cent
Heavy Commercial	2	1	2	1	3	2	0	0	1	1	8	5
Light Delivery Van	2	1	1	1	0	0	0	0	0	0	3	2
Car	46	29	25	16	21	13	3	2	3	2	98	63
Minibus	8	5	2	1	1	1	0	0	0	0	11	7
Other	12	8	7	4	13	8	2	1	2	1	36	23
Total	70	45	37	24	38	24	5	3	6	4	156	100

c) Rail Accidents and Hazards

As illustrated in **Drawing 5.7.3**, there are no railway lines that pass within 16 km of the site. There are also no future plans to provide rail infrastructure within 16 km of the site. Therefore, no rail-based sources of external hazards are present or envisaged within the site vicinity.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-138

No further evaluation of this potential source of external hazard has therefore been conducted for the purposes of this TSSR.

d) Shipping Accidents and Hazards

Any ship experiencing problems and wishing to enter a South African port is inspected at sea by the South African Maritime Safety Authority (SAMSA) and other officials to assess the risk to the coastline. The vessel is permitted to enter South African waters only if no significant risk is posed.

Shipping hazards include oil spills, lost containers and debris from wrecked vessels and accidental explosions, which could cause a pressure or shock wave. Note that the dumping at sea of any waste or other material within the coastal waters or Exclusive Economic Zone of South Africa is not allowed without a dumping permit (Republic of South Africa, 2008) (International Maritime Organisation, 2018).

Significant incidents that occurred nearest to the site involved the:

- grounding of the *Kapodistrias* off Cape Recife (93.75 km east), more than 80 km to the east-northeast of the site in 1985, when small quantities of heavy fuel oil were released and moved away in a north-eastern direction into Algoa Bay – As a result more than a thousand penguins were affected;
- the collision of the two sister tankers, *Venoil* and *Venpet*, which collided and resulted in about 24 000 t of spilled crude oil off Plettenberg Bay (88.76 km west-northwest) in 1977 – The oil washed ashore between Mossel Bay and Great Brak River, with no pollution of the beach areas between Gqeberha and Cape Agulhas.

In December 2023, a fishing vessel ran aground at Cape St. Francis in the night. The cause of the incident is yet to be established. Salvage works had already commenced and were observed during a site visit in February 2024.

Research conducted that evaluated shipping incidents along the South African Coast for the period 1946 to 2011, found that of the 1 300 recorded shipping incidents, 275 incidents occurred on the Southeast Coast (St Sebastian Bay to the Great Fish Point). The

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-139

Southeast Coast marine hazard season has a winter peak from June to July (Mearns, 2012).

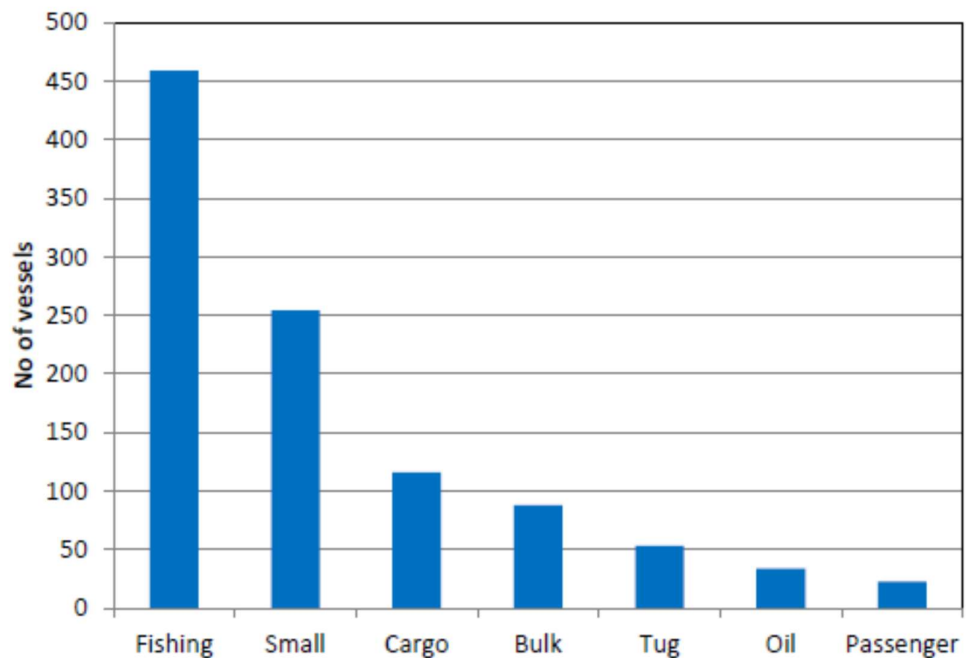


Figure 5.7.24
Marine vessels involved in Shipping Incidents for the Period 1998 to 2011

The majority of the accidents involved fishing boats and small crafts, as illustrated in **Figure 5.7.24**. This outcome is not unexpected in view of the number of such vessels compared to that of the larger vessels visiting South African ports, as well as the pressure on fishermen to earn an income despite weather conditions. A high number of fishing boat accidents often involve sinking or groundings. Small vessel incidents are most often capsizing, sinking or collisions. Many cargo and larger bulk carriers are also often involved in shipping accidents, many of these due to substandard ships, age of vessels, lack of proper maintenance, lack of proper basic training of crews, budgetary cuts leading to too small crews and lack of communication between multinational crews (Mearns, 2012).

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-140

The list of shipping incidents noting the date, location reporting authority, name of the vessel and a description or cause of the incident is included as **Appendix 5.7.E**. The data were obtained from the South African Maritime Safety Authority (SAMSA) for the period 2007 to February 2024.

The evaluation of external events resulting from marine transport accidents and a bounding ship accident frequency analysis is reported on in **Chapter 6**.

Marine Pollution Contingency Planning

In terms of the Marine Pollution Act (Act 6 of 1981), the Department of Transport is responsible for ensuring that the appropriate actions are taken to minimise the impact of discharges of harmful substances (e.g. oil) from ships, tankers or offshore installations. In terms of the South African Maritime Safety Authority Act (Act 5 of 1998), the majority of these responsibilities are transferred to the SAMSA.

The responsibility for combating pollution of the sea and shoreline by oil is however delegated to the Minister of Environmental Affairs (DEA). DEA is therefore responsible for the protection and clean-up measures to be taken once oil has been released into the sea, while SAMSA's responsibilities are limited to those actions required while the oil is within the confines of the ship.

DEA is therefore responsible for, inter alia, the following:

- the co-ordination and implementation of coastal environmental protection and clean-up measures;
- control of the use of the pollution combating vessels and surveillance aircraft;
- control of the use of oil spill dispersants and dispersant spraying operations;
- compilation and maintenance of the DEA Local Coastal Oil Spill Contingency Plans;
- the approval of contingency plans for offshore installations in consultation with SAMSA.

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-141

SAMSA is responsible for the following:

- the overall co-ordination of the prevention and/or combating of an oil spill incident;
- the control of the technical aspects of shipping casualties;
- the supervision of oil trans-shipments;
- the prosecution of parties guilty of the deliberate discharge of oil;
- the compilation of contingency plans relating to the control of shipping casualties or potential casualties;
- administering the acts relating to oil pollution;
- taking charge of the legal and financial aspects relating to oil spill incidents and casualties;
- the control of the use of the standby oil pollution prevention tug;
- the issuing of pollution safety certificates to offshore installations (Department of Environmental Affairs, 2010).

In order to structure the actions to be taken in the event of an oil spill, various plans have been compiled, each dealing with a particular aspect of the spill situation. Together they form the National Contingency Plan that consists of:

- the Master Plan;
- a Plan for Control of Shipping Casualties;
- a Plan for Combating Oil Spilled at Sea;
- local coastal plans;
- plans for independent installations.

Two oil spill contingency plans apply to the site region. Oil Spill Contingency Plan No. 10 Diaz (Department of Environmental Affairs, 2010) and Oil Spill Contingency Plan No. 9 Humansdorp (Department of Environmental Affairs, 2020) as illustrated in **Figure 5.7.25**.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-142

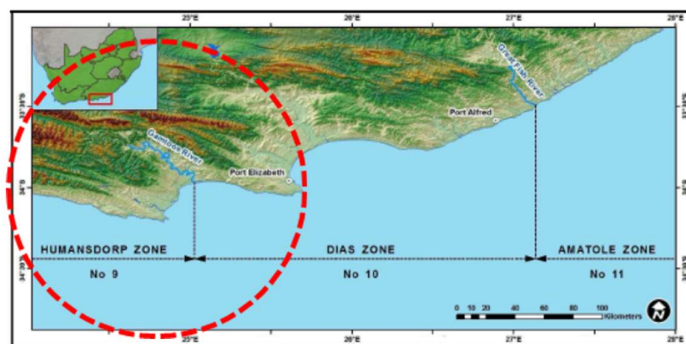


Figure 5.7.25
Oil Spill Contingency Plan No. 10 Diaz Zone Relative to the
80 km radius

e) Fires

As described in **Section 5.5**, the 16 km zone is covered predominantly by cultivated, commercial dryland, low shrubland and tall shrubland, all of which could pose a risk of fire. Two parcels of indigenous forest (9 km northwest and 13 km north-northwest), as well as a small pine plantation (15 km west-northwest), occur within 16 km of the site and could also pose as potential fire hazard (see **Drawing 5.7.8**).

According to international practice, the occurrence of fires need only be evaluated within 2 km of the owner-controlled boundary (OCB). Data on fires was provided by the St. Francis Bay fire brigade for 35 km around the site. The information showed that seven small veld fires were recorded within a 2 km radius of the OCB in the last five years. The existence of alien vegetation caused the spread of these fires. Two large veld fires also occurred in 2007, both near the Krom River smallholdings (10.9 km northeast). The causes of these fires are not known (Eskom, 2015a).

In 2024, data were obtained from the Kouga Municipality on fire incidents for the period January 2018 to March 2023, as set out in **Table 5.7.31**.

In addition, fire data were also sourced via the NASA Global Fire Detection System for the period 2014 to 2024 and are illustrated on **Figure 5.7.26**.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-143

Table 5.7.31
Extensive External vegetation Fires in the Site Vicinity
(January 2018 to March 2023)

OCCURRENCE FOR FIRE WITHIN THE 35 KM OF AREA		
DATE	LOCATION OF FIRE	CAUSE EXTENT OF BURN
04 January 2018	Field Fire- Oyster Bay	Unknown
04 January 2018	Field Fire- Oyster Bay	Unknown
21 July 2018	Bush Fire- Impofu Dam	Unknown
28 March 2022	Bush Fire- On the road to Oyster Bay	Unknown
12 March 2021	Brakemduine- Oyster Bay	Unknown
27 January 2023	Kromhout Farm- Oyster Bay	Unknown
03 March 2023	Brakemduine- Oyster Bay	Unknown

Over the 2014 tot 2024 period, a total of 76 fires were recorded by both the Kouga Local Municipality Fire Department and the NASA Global Fire Detection System. When broken down into years, the occurrences are as follows:

- 2014: NASA: 2;
- 2015: NASA: 3;
- 2016: NASA: 31;
- 2017: 0;
- 2018: Kouga: 3 and NASA: 2;
- 2019: NASA: 2;
- 2020: NASA: 4;
- 2021: Kouga: 1 and NASA: 13;
- 2022: Kouga: 1 and NASA 3;
- 2023: Kouga: 2 and NASA: 3;
- 2024: NASA: 6.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-144

Data were also sourced from reports on fires in the local newspapers and national media sources.

The site vicinity has experienced fires within recent years, mostly veld fires on tracts of alien invaded veld, boosted by strong winds. The presence of numerous thatch roof houses being in close proximity to these veld areas also pose a risk for the spreading of fires.

In 2018, 11 houses in St. Francis Bay caught alight due to a veld fire. The fire started as a result of informal settlers clearing space for the erection of informal dwellings by setting the vegetation alight. However, due to strong winds, the fire spread to surrounding areas and eventually caught onto thatch roof houses in surrounding formal suburbs.

In 2018, a second major fire broke out in St. Francis Bay. Arson was deemed the cause of the fire, which caused damage to 13 homes in St. Francis Bay.

More historically, in 2016, a major fire started in the nature reserve bordering the Thyspunt area on 23 January 2016. The fire also spread towards the St. Francis Airfield.

In 2014, a fire started in the Kosovo informal settlements in Sea Vista at St. Francis Bay, with 1 reported fatality and 11 shacks destroyed.

In 2012, firefighters reported 100 homes burnt down at St. Francis Bay. The fire was exacerbated by the strong winds. The cause of the fire was unknown; however the thatch roof houses triggered the long burning.

Another major fire took place on 12 November 2012 where a total of 76 houses were destroyed, which resulted in R500 million worth of damages.

In 1998, the area from the Kromme River Estuary, across St. Francis Bay to the lighthouse experienced a major fire spread, where damages amounted to an estimated R2 million.

The sourced data indicate that no fires were recorded on the proposed Thyspunt site (Planning Partners, 2024e).

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-145

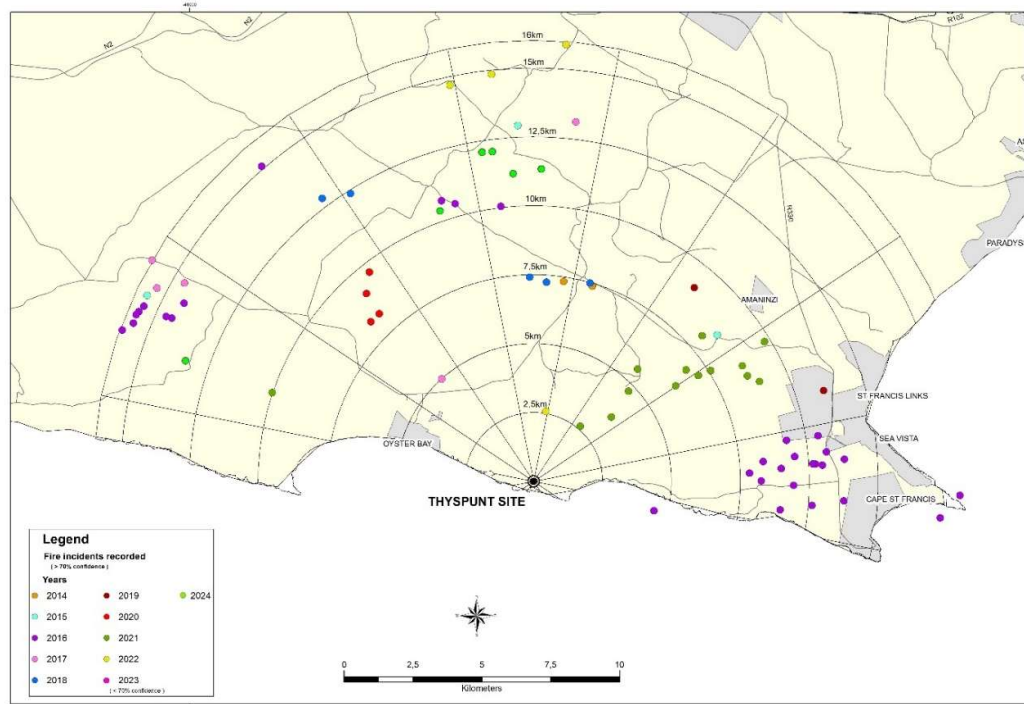


Figure 5.7.26
Fire Incidence within the Site Vicinity (2014 to 2024)

Figure 5.7.27 illustrates the fire incidents, based on both data sources that occurred within 2 km of the OCB. In total 8 fires were recorded for the period 2014 to 2024. No fires were recorded for the years 2023 and 2024.

The fire incident located within the ocean relates to a fire that occurred on board a fishing boat in 2016.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-146

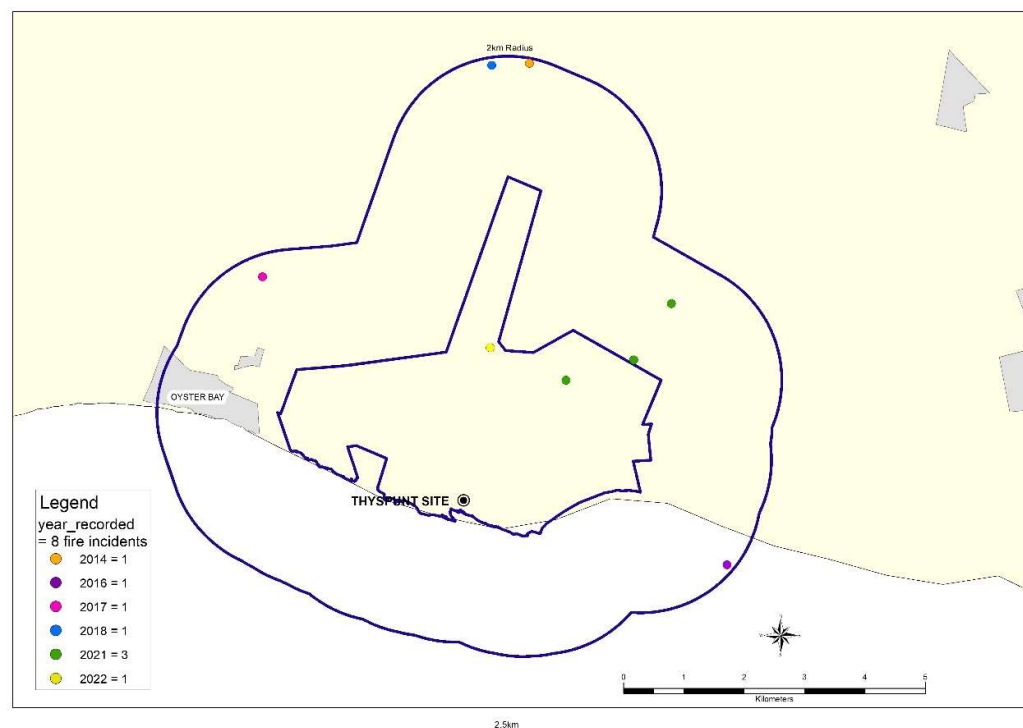


Figure 5.7.27
Fire Incidence within 2 km of the Owner-controlled Boundary
(2014 to 2024)

Potential Sources of Fire

- Vegetation

The Cape St. Francis area forms part of the south-eastern Cape Floristic Region. The area is characterised by hairpin and parabolic dunes with parallel ridges alternating with swales with soils of the vegetated dunes being well-drained apedal sands of moderate alkalinity. The thicket mosaic is dominant in the larger Cape St. Francis region. Some vegetation types represent potential sources of veld fires. A land use survey that was conducted for the TSSR project recorded the bulk of the area within the 20 km radius around the site vicinity as agriculture and natural areas. The land within the 5 km radius from the Thyspunt site is predominantly covered by tall shrubland (dune fynbos/thicket), pastures between the west-

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-147

northwest and northeast sectors, and east-west trending sand dunes across the dune fynbos/thicket. Oyster Bay, a coastal village, also occurs in this zone and is the nearest residential area to the Thyspunt site, approximately 4 km away. Heavy alien infestation (port jackson and rooikrans) was observed in the coastal areas. In the 5 to 16 km radius there is presence of dune fynbos/thicket in the west and west-northwest sectors and between the east-northeast and east sectors (i.e. along the coast). One Eskom substation was also recorded within the site vicinity (Planning Partners, 2024e).

- Overhead Transmission Lines

Overhead transmission lines may potentially ignite bush and grass vegetation.

There is an existing 22 kV line that passes south of the site, which can provide approximately 8 MVA. A new 66 kV line will be required from the St. Francis Bay substation to the site and it is anticipated that this line will follow the planned eastern access road from St. Francis Bay to the site. (Planning Partners, 2024e).

- Flammable Substances Stored within the Site Vicinity

A survey was undertaken of potentially flammable substances stored within the site vicinity, e.g. at service stations and industrial areas. These substances, including diesel, petrol and LPG, could result in fires should they ignite. The detail of this survey is included in **Subsection 5.7.13**.

The above historical data shows that fires need to be considered as a potential hazard for the planned nuclear installation(s). The risk to the nuclear installation(s) from off-site fires can be managed through the implementation of a fire management plan that includes the creation of fire breaks cleared regularly to prevent external fires from burning into the site.

f) Electromagnetic Interference

Electromagnetic interference can affect the functionality of electronic devices. It can be initiated by both on-site and off-site sources. The presence of central telephone installations near the site or on-site installations could give rise to specific provision being made during the

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-148

design stage to mitigate against the effects of electromagnetic interference. Within 16 km of the site there is both a telephone exchange building and microwave tower located at Oyster Bay, 5 km from the site. Another exchange building is located within St. Francis Bay (11 km east), as well as a street cabinet (11 km east). Seven cell phone masts are also located within 16 km of the site. Their frequency and intensity are summarised in **Table 5.7.32** (Eskom, 2015a).

Table 5.7.32
Sources of Electromagnetic Interference

Source	Frequency (MHz)	Intensity (dBm)	Distance (km)	Direction
Oyster Bay Telkom Cell phone Mast	890 – 2 125	49.4	5.02	WNW
Telkom Exchange	1901-1918	24	5.04	WNW
Oyster Bay Microwave Tower	18663-19673	25	5.04	WNW
St Francis Vodacom Cell phone Mast	890 – 2 125	49.9 – 50.7	10.83	E
Telkom Street Cabinet: Cape St Francis DLUB 700	n/a	10	11.70	E
Telkom Exchange	21910 -23142	24	11.58	E
Vodacom Cooper House MC1 Cell phone Mast	n/a	n/a	11.84	E
Vodacom Cape St Francis Resort MC1 Cell phone Mast	890 – 946	40.2	12.12	E
Vodacom St Francis Drive Cell phone Mast	890 – 2 125	51.1 – 54.2	12.50	ENE
Transtel Cape St Francis Cell phone Mast	890 – 2 125	50.9	12.51	ESE
Vodacom Port St Francis MC1 Cell phone Mast	890 – 2 125	52.3	13.89	E

g) High Energy Rotating Equipment

As illustrated in **Drawing D-5.7.6** and based on a physical site survey conducted in February 2024, there are a number of wind farms that have been constructed within the site vicinity and there are others that are in planning in the site region. Two constructed windfarms are located to the

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-149

immediate north of the site. One is located just beyond the 2.5 km radius to the north and extends up to and beyond 10 km radius to the northwest. The other is located to the east from 12.5 km up to 20 km from the site (Planning Partners, 2025).

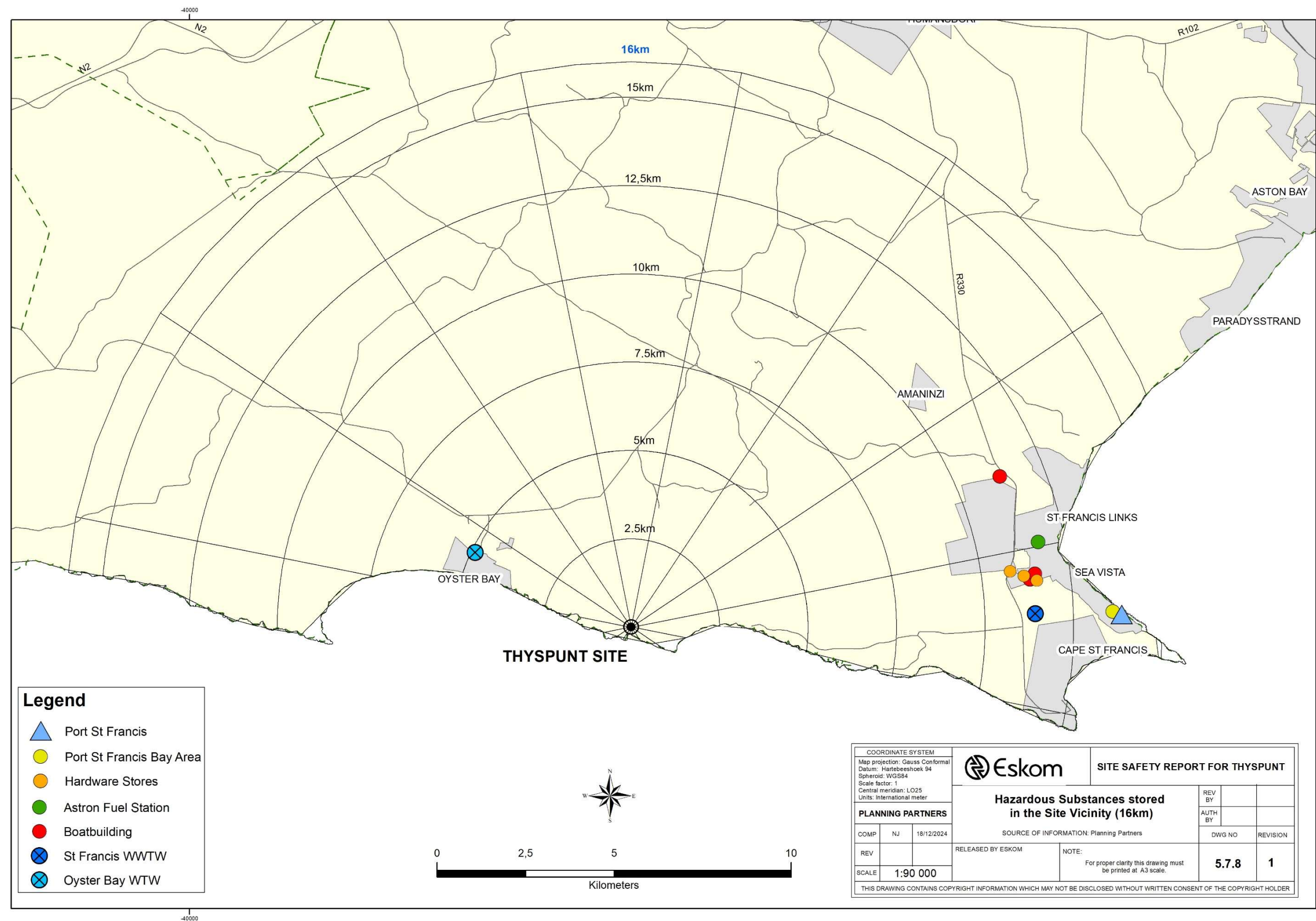
h) Radiological Hazards

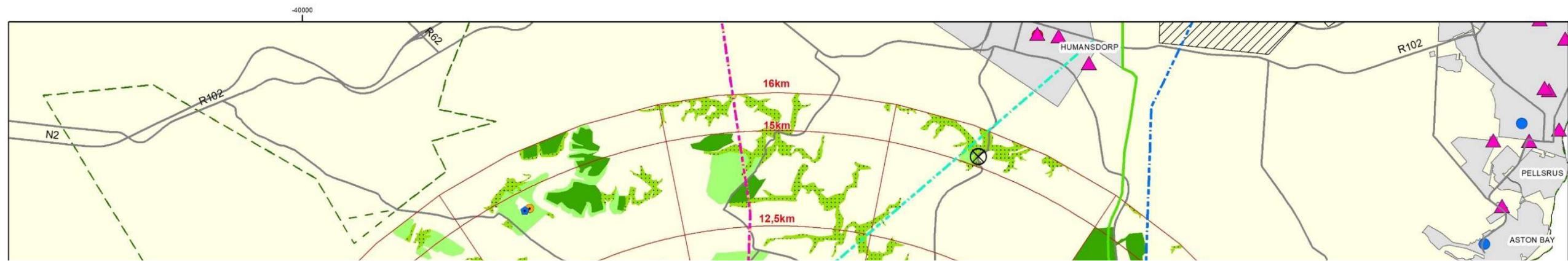
Low, intermediate and high-level waste as well as fresh and spent fuel will be handled, managed and controlled within the radiological zones of the nuclear installation(s). Some of the waste (low and intermediate level) is planned to be shipped to a disposal site at Vaalputs following the Eskom operating procedures. Road transport is planned to be along the feeder route to the N2, towards Vaalputs. The feeder route alignment still needs to be determined. The quantity of radioactive waste and fuel will depend on the number of reactors and the operating history and procedures of the nuclear installation(s). An estimation may be based on the quantities generated by KNPS, scaled by the ratio of power output and taking into account modernisation of the plant (Eskom, 2008).

Handling and transportation of the spent fuel and radioactive waste from the site could have the potential for hazards, if those activities are not undertaken in accordance with the safety requirements and criteria.

i) Human-Induced Hazard Source Map

Drawing 5.7.8 illustrates the relative location of hazardous substances stored in the site vicinity. **Drawing 5.7.9** summarises the sources of potential external hazards associated with particular activities and vehicular transportation routes used within the site vicinity and should be read in conjunction with **Drawing 5.7.2**, which illustrates the location of air routes, **Drawing 5.7.5**, which illustrates the location of shipping lanes and **Drawing 5.5.6**, which illustrates vegetation cover that is prone to veld fires in the site vicinity.





Redacted

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-152

5.7.16 Main Activities Related to Storage and Transportation of Hazardous Substances Relevant to Nuclear Installation Safety

5.7.16.1 Stationary Sources of External Hazards

Stationary sources of external hazards were identified within 16 km of the site.

No stationary sources of risk associated with industrial development have been identified to date. There are no plans to further develop industrial areas within the site vicinity. Therefore, it is unlikely that future hazards associated with industrial activity will be located within the site vicinity over the nuclear installation lifetime. This aspect would, however, need to be monitored and industrial development restricted (if necessary) within 16 km of the site over the lifetime of the facility.

As there are no railway lines within 16 km of the site and no railway infrastructure is planned within the site vicinity, rail-based hazards do not pose a threat to the planned nuclear installation(s).

There are no external sources of hazards associated with military bases and military activities within 16 km of the site.

Petrol, diesel and LPG stored at the filling station in St. Francis Bay and within the Port of St. Francis occur within 16 km of the site and have been included in the hazard source inventories.

Acetone and polyester resin are used in the boat building industry located in St. Francis Bay and have been included in the hazard inventories.

Fire presents a real threat in the study area, and the appropriate fire management and prevention plan must be put in place to protect the site from the threat of fire.

The other stationary sources of potential hazards for the nuclear installation(s) are the hazardous materials that may be stored on the site. Identification of the on-site chemical inventory in this TSSR is based on the assumptions relying on the EIA consistent data set and the KNPS experience. A final inventory will need to be compiled as part of the SAR to specify the actual future bulk chemical transport to the site.

5.7.16.2 Mobile Sources of External Hazards

Potentially hazardous activities around the site also relate to modes of

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-153

transport and hazardous substances transported within 16 km and the incidence of fires within a 2 km distance.

Potential sources of aircraft crashes in the region are represented by general air traffic within the CDSIA Terminal Control Area, air corridors depicted in **Drawing 5.7.2** and the potential for an aircraft crash at take-off or landing at St. Francis Airfield, Paradise Beach Airfield and the CDSIA. To mitigate against these threats, a 'no-fly' zone should be implemented above the site.

Petrol, diesel and LPG are transported to St. Francis Bay and Port of St. Francis using the main transport route in the site vicinity, the R330, where the majority of accidents involved passenger and light vehicles.

Large quantities of crude oil are also transported pass the site. This transport takes place on sea in the traffic separation zone located between 20 and 25 nmi off the coast (see **Drawing 5.7.5**). The majority of the marine traffic along the site consists of bulk carriers, general cargo vessels, tankers and container vessels that are all known to carry between 3 000 to 11 000 t of bunker fuels. These vessels are deemed to pose the greatest potential hazard to the nuclear installation(s) due to traffic density vis-à-vis other sea going vessels and the large volumes of bunker fuels they carry for their own propulsion.

Other hazardous substances transported pass the site by ships could not be quantified for the purpose of this section, since no definitive data could be sourced. As a result a study performed considered the impacts of man-induced events due to marine transportation and concluded that commercial shipping lanes around Thyspunt are located 20 and 25 nmi offshore with little chance of fires, explosions and chemical releases impacting on the proposed nuclear facility (Riscom, 2012).

In the event of a large accidental release of flammable materials close to Thyspunt, pool fires would damage structures 130 m from the centre of the release while vapour cloud explosions could damage structures up to 387 m downwind of the release (Riscom, 2012).

Wind farms have been constructed within the site vicinity and the nearest facility is located 2.5 km to the north of the site, but more than 1 km from the site footprint envelope. Given the distance, it is unlikely that a dislodged rotor blade could reach the nuclear installation(s).

Identification of future bulk chemicals transported to the site is based on assumptions from the EIA consistent data set and the KNPS experience.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-154

A final inventory will need to be compiled to specify the actual future bulk chemicals transported to the site. The potential impact of each chemical will need to be evaluated in the next revision of this TSSR, and also in the SAR, and reviewed once the design of the nuclear installations(s) is known to assess the impact on the structures. Potential vehicular accidents involving trucks transporting nuclear fuel to the site and radioactive waste from the site also pose a risk to the planned nuclear installation(s).

Explosives used for mainly construction purposes are transported within 16 km of the site on the roads of Humansdorp/St Francis Bay (R330) and the Humansdorp/Oyster Bay Road and could pose a possible risk to the nuclear installation(s).

76 fires have occurred within the site vicinity, of which 8 occurred within 2 km of the OCB, over the period 2014 to 2024 and some spread was caused by the occurrence of alien vegetation in the area. None were recorded for the period 2023 to 2024. Several serious fires occurred where homes were destroyed, some exacerbated due to thatched roofs, others due to high winds and informal construction material. An appropriate fire management plan must be developed at the nuclear installation(s) (part of the SAR) and be implemented to address this hazard.

The evaluation of the mobile sources of external events and associated initiating events is further analysed in **Chapter 6**.

5.7.17 Considerations Important to Emergency Planning

The site evaluation also considered the transportation network within the context of the feasibility of the emergency planning, with particular emphasis on the feasibility of potential evacuation. The results showed that the road infrastructure would need to be upgraded for both construction and operational purposes in order to provide adequate and reliable access to the site, from both St. Francis Bay and Oyster Bay.

With the planned road infrastructure improvements, it was estimated that the 2036 projected population of 14 101 (about 3 505 vehicles) can be evacuated from the site vicinity within 2.5 hours (Innovative Transport Solutions, 2024b). The EPZs have been chosen to avoid the need to evacuate persons beyond the site boundary. Nonetheless, a detailed evacuation plan will be compiled for the Thyspunt nuclear project on the site as part of the emergency plan for the site. This aspect of nuclear safety is described in detail in **Chapter 8**.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-155

Emergency services within the site region, and the site vicinity in particular, were identified as potential support services in the case of a radiological incident or accident. Their roles and duties must be defined in terms of the detailed emergency plan prior to the nuclear installation operation. This aspect of emergency planning for the site is described in detail in **Chapter 8**.

5.7.17.1 Police Stations

The police stations within the site region include St. Francis Bay (P1), Humansdorp (P2), Jeffreys Bay (P3), Hankey (P4), Patensie (P5) and Kareedouw (P6) and are presented in **Table 5.7.33** and graphically illustrated in **Drawing D-5.7.10**. South African Police Service (SAPS) has an overall staff number of 350 officers stationed within the site region. The codes (P) in **Table 5.7.34** correspond to the codes on **Drawing D-5.7.9**. Data presented below were collected in 2024, and their locations has been verified through desktop study and a physical site survey conducted in February 2024 (Planning Partners, 2024f).

Table 5.7.33
Police Stations (2024)

Code	Name	Distance (km)	Direction
P1	St. Francis Bay Police Station	11.60	E
P2	Humansdorp Police Station	18.84	NNE
P3	Jeffreys Bay Police Station	25.07	NE
P4	Hankey Police Station	43.0	NNE
P5	Kareedouw Police Station	45.0	NW
P6	Patensie Police Station	49.0	NNE

5.7.17.2 Emergency Services

The distribution of fire stations, ambulance services, the NSRI base stations and traffic departments in the site region is summarised in **Table T-5.7.29** and graphically illustrated in **Drawing D-5.7.9**.

These emergency services include civil organisations and local representatives of state organs that are trained in emergency response. These groups are envisaged to support any emergency response action in the event of a nuclear incident or accident at the nuclear installation(s). The support could include medical, law enforcement, communication and

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-156

evacuation assistance. Their roles would need to be defined in the emergency response plan for the planned nuclear installation(s) (planned to be submitted in support of the SAR).

Data presented below were collected in 2024, and their locations have been verified through desktop study and a physical site survey conducted in February 2024. Data collection and verification is ongoing.

a) Fire Stations

There are two fire stations located within the site region, one of which is within the site vicinity, as illustrated in **Drawing 5.7.10**. The St. Francis Bay Fire Department (EM2, 13.3 km northeast) is located nearest to the site. The other fire station is located within Humansdorp (EM7, 18.4 km north-northeast).

The Kouga Local Municipality provides fire and emergency services for its municipal area, which includes Jeffreys Bay, St. Francis Bay, Oyster Bay, Humansdorp, Hankey, Patensie, Loerie, Thornhill, Aston Bay and Paradise Beach. For the Municipality's fire service department to render services to all areas, satellite fire stations are established in the following areas:

- Hankey, corner of Main Road and Damon Street (8 staff members and 1 emergency vehicle);
- St. Francis Bay, St. Francis Drive (8 staff members and 2 emergency vehicles);
- Jeffreys Bay, St Croix Street (12 staff members and 3 emergency vehicles);
- Humansdorp, R330/Hankey Road (12 staff members and 4 emergency vehicles).

Within the site region, there is a total of 43 fire fighters stationed, assisted by control room operators and an administration officer.

These two fire stations have two firefighting vehicles (one 6 000 l tanker and one 4×4 rural fire fighting truck), one disaster vehicle and one lifesaving vehicle (Planning Partners, 2024f).

Fire Stations in the site region are set out in **Table 5.7.35**.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-157

b) Hospitals

Hospitals are reported on in **Section 5.4**. There is a total of four public and private hospitals located within the site region, but none within the site vicinity. Three of the four hospitals are located within Humansdorp and the remaining one being in Kareedouw. The nearest hospital to the site is the P.Z Meyer TB Hospital in Humansdorp with 57 beds (H1, 17.4 km north-northeast) (See **Table 5.7.34**) (Planning Partners, 2024f).

Table 5.7.34
Hospitals in the Site Region (2024)

Code	Name	Distance	Direction
H1	P.Z. Meyer TB Hospital	17.44	NNE
H2	Life Isivivana Private Hospital	17.59	NNE
H3	Humansdorp Provincial Hospital	17.60	NNE
H4	BJ Vorster Hospital	46.81	NW

c) Ambulance Services

There are four ambulance services located within the site region, but none within the site vicinity. The Eastern Cape Emergency Medical Service (EM5, 17.6 km north-northeast) is a service offered by the Department of Health. The Eastern Cape Emergency Service (EM6, 17.7 km north-northeast) is in partnership with the Kouga Local Municipality. These services are illustrated in **Drawing 5.7.10**. The Gardmed Ambulance Services (EM8, 26.1 km northeast) is a private company ambulance service that offers its services in and around Jeffreys Bay. The Humansdorp Emergency Service (Kareedouw) (EM9, 46.8 km northwest) located in Kareedouw forms part of the Kouga Disaster Management and offers its service in and around Kareedouw (See **Table 5.7.35**) (Planning Partners, 2024f).

d) Sea Rescue Services

The National Sea Rescue Institute (NSRI) has two coastal stations located within the site region, namely the Oyster Bay Base (EM1, 5.1 km west-northwest) and the St. Francis Bay Base (EM3, 15,1 km east). See **Table 5.7.35** These base stations are illustrated in **Drawing 5.7.10**. The NSRI assists in all types of sea rescue operations and has the capacity to reach water users in the event of a terrestrial or nautical emergency.

The two NSRI stations have combinedly 2 senior lifeguards and

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-158

52 seasonal lifeguards.

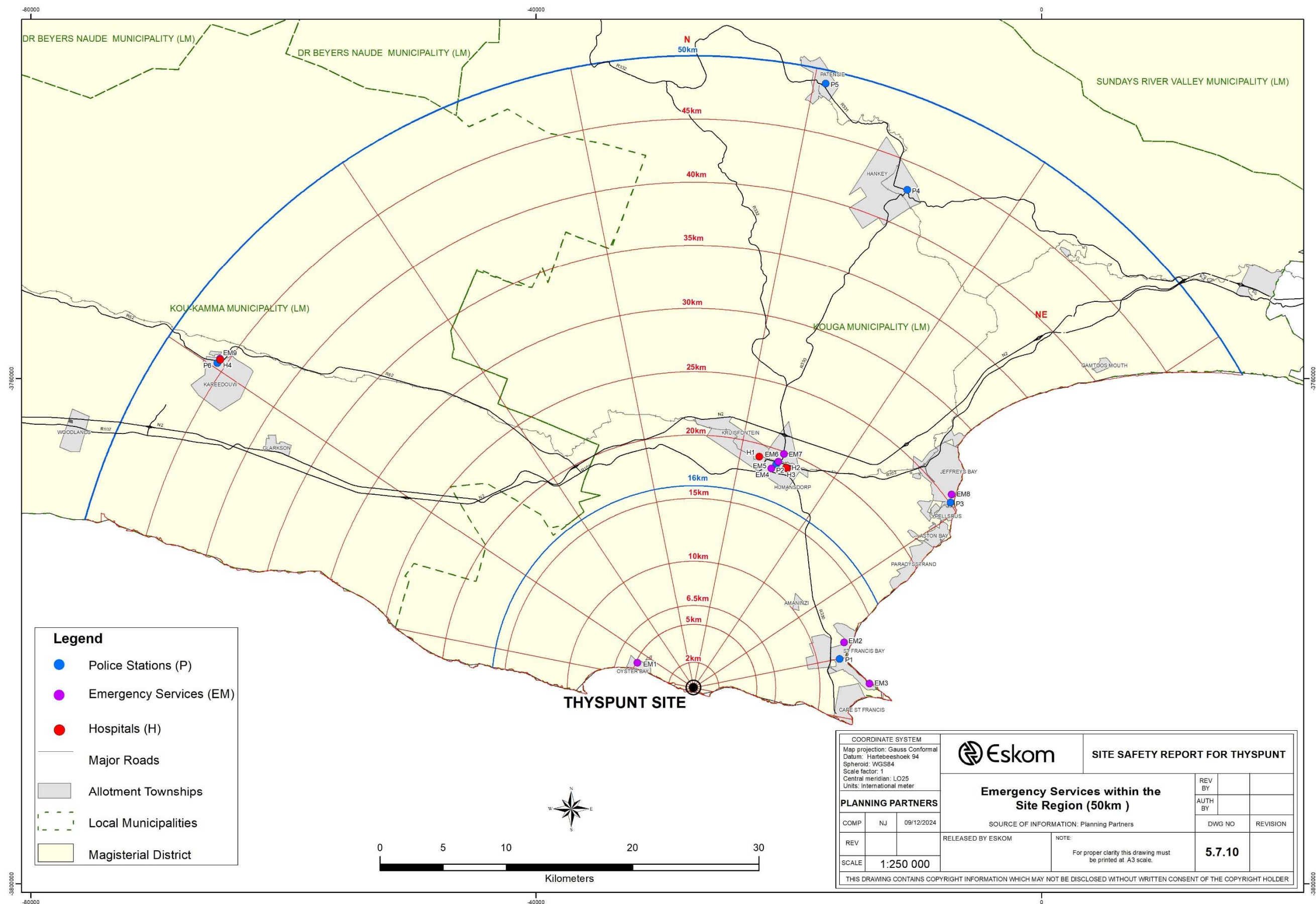
The nearest NSRI station to the site is located at Oyster Bay (5.14 km west-northwest), with 27 crew, 18 trainees, 4 rescue vessels and 1 rescue vehicle (NSRI, 2024), (NSRI, 2023). The other NSRI station within the site vicinity, St. Francis Bay station (15.10 km east), has five crew and three rescue vessels. The NSRI (EM2) also operates from the Port of Gqeberha/Port Elizabeth (beyond the 50 km radius) (Planning Partners, 2024f).

e) Traffic Departments

There is one traffic department located within the site region in Humansdorp (EM4, 17 km north-northeast) (See **Table 5.7.35**). The Kouga Local Municipality also employs municipal law enforcement officers to assist the traffic department. There is a total of 20 traffic officers stationed within the site region (Planning Partners, 2024f).

Table 5.7.35
Emergency Services in the Site Region (50 km)

Code	Name	EMS	Distance	Direction
EM1	NSRI Oyster Bay	NSRI	5,14	WNW
EM2	St. Francis Bay Fire Department	Fire Department	13,32	ENE
EM3	NSRI St. Francis Bay	NSRI	15,10	E
EM4	Humansdorp Traffic Department	Traffic Department	17,01	NNE
EM5	Eastern Cape Emergency Medical Service	Ambulance Services	17,62	NNE
EM6	Eastern Cape Emergency Services	Ambulance Services	17,70	NNE
EM7	Humansdorp Fire Department	Fire Department	18,40	NNE
EM8	Gardmed Ambulance Service Jeffreys Bay	Ambulance Services	26,10	NE
EM9	Humansdorp EMS (Kareedouw)	Ambulance Services	46,88	NW



	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-160

5.7.18 Management of Uncertainties

5.7.18.1 Lack of or Limited Information

While the development of this TSSR has been based on the most current and up-to-date available information, it must be noted that data collection is still ongoing and that further updates will be done at a later licensing stage.

A lack of or limited data were noted for the following:

- Information regarding the hazardous materials expected at the site was based on the EIA consistent data set and the KNPS experience. The hazardous materials that will occur on site need to be confirmed at the time of appointment of a nuclear installation vendor, at which time a complete list can be compiled.
- At the time of preparing the TSSR (Rev0), there were no collated official road accident data and the data presented was based on a physical search of police accident sheets at local police stations. At the time data were obtained for a single year and are therefore limited. This problem persists and for the 2024 study, road accident data was not forthcoming from the Eastern Cape Roads Authority. The data have therefore not been updated.
- Data on telecommunications infrastructure was also not forthcoming with most service providers stating that the data is confidential, due to the highly competitive nature of the industry.

5.7.18.2 Incomplete Information

The following data reflected in this section of the TSSR are considered to be incomplete. In particular, data related to nuclear installation(s) design that cannot be quantified or determined in detail at this stage are relevant:

- The identification of future bulk chemical transport to the site is based on assumptions made using the consistent EIA data set and the KNPS experience. A final inventory will need to be compiled to specify the anticipated future bulk chemical transport to the site once the nuclear installation design has been finalised.
- Alternative road infrastructure improvements are proposed by Eskom to

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-161

provide improved access from the N2 highway to the site and to accommodate heavy road traffic between Gqeberha and the site. The final routes still need to be decided by Eskom based on the findings of the Traffic Impact Assessment and in terms of Eskom strategic planning. All access route alternatives were considered for the purposes of the TSSR update. While this SSR makes recommendations on the preferred options, the TSSR will need to be updated once the final access route alignment has been determined.

- While an environmental authorisation has been issued for alternative transmission line routes. Eskom is currently conducting updated grid infrastructure studies. These studies will reflect the network upgrades that are required for the actual plant to be installed at the Thyspunt site. Once confirmed the TSSR will be updated.
- The amount of radioactive material (fuel and waste) to be transported to and from the nuclear installation(s) needs to be clarified, and will be dependent on the type of nuclear installation(s) to be constructed on the site.
- Information presented for hazardous material related to marine transportation near the proposed Thyspunt facility is limited to oil and fuel. No detailed inventory could be prepared, since no definitive data could be sourced. The record of shipping accidents in the site region notes spillage and leaking of hazardous substances as well as oil and fuel spills.
- Although this work considered potential hazards posed by large shipping accidents within shipping lanes that pass the site, accident scenarios resulting from power failure, human error, structural failure of vessels outside of the shipping lanes was not considered.

The need to include and report on a more comprehensive ship accident risk analysis is being investigated and may be reported on in a later version of the SSR in the next licensing phase.

5.7.19 Monitoring

As set out in **Section 5.2**, none of the topics covered in this **Section 5.7** are subject to monitoring.

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-162

However, the data on site characteristics and activities that present a potential source of external hazard to the nuclear installation(s) described in this section must be updated periodically.

5.7.19.1 Prior to Nuclear Installation Operation

Once a final decision is made with respect to the type of reactor(s) to be built on the site and the associated bulk chemical and hazardous inventories can be confirmed, the subsections related to on-site hazards and bulk transportation of hazardous substances to and from the site must be updated and reflected in the hazard evaluation in **Chapter 6**. This is also relevant for the estimation of the extent of transportation of radioactive material (fuel and waste) to and from the nuclear installation(s).

The final planned service infrastructure required to service the site must be included in this TSSR and its subsequent revisions prior to nuclear installation construction.

A declaration of a restricted flying area above the site, will need to be issued in terms of the Civil Aviation Act, 2009.

5.7.19.2 During Nuclear Installation Lifetime

Changes in land use that could result in the location of new or extended stationary or mobile sources of hazards in the site vicinity is planned to be monitored by Eskom throughout the nuclear installation lifetime. The monitoring of hazards will include monitoring of hazardous activities in the site vicinity and the region, where appropriate, according to the type of activity concerned.

It is unlikely that pipelines and mining activities could become sources of external hazards in the future. However, these activities need to be monitored over the lifetime of the nuclear installation(s).

There are limited plans to develop further industrial areas at St. Francis Bay within 16 km of the site. Detailed proposals are currently not known. The potential for industrial development needs to be monitored over the lifetime of the nuclear installation(s). Refer to **Sections 5.4** and **5.5**, which deal with the control of land use and development within the vicinity of the site in detail.

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-163

In cases where new sources of hazards (mobile or stationary) occur around the site, they will be evaluated and appropriately addressed in the operational documentation (e.g. future TSSRs, Safety Analysis Report and emergency plan) of the nuclear installation(s).

5.7.20 Management System

The investigations, assessment and evaluation of present and future transportation, industrial and military facilities in the site region entailed the following components:

- desktop study;
- site investigations;
- receipt/use of data from other TSSR investigations;
- data analysis and reporting;
- use of computer software, in particular excel sheets and GIS, for collating, interpretation and presentation of data;
- mapping and creation of a GIS database and data management system.

A quality assurance programme for the transportation, industrial and military facilities evaluation was established to control the effectiveness of the execution of the site investigation and data analysis. This conforms to the overall management system for this TSSR (see **Chapter 10**) and the Eskom guidelines, i.e. to the appropriate grading for safety classification in terms of RD-0034 (National Nuclear Regulator, 2008) and Eskom's NSIP02189 (Eskom, 2021) classification procedure. The evaluation of transportation, industrial and military facilities around a nuclear installation site has been determined as Safety Level 2, Safety Qualification 2 (for external man-made hazards and storage and transportation of hazardous substances) and Safety Level 3, Safety Qualification 3 (for civil infrastructure and installations) (Eskom, 2021). In terms of the procedure, the minimum RD-0034 requirements for Level 2 processes must be complied with. This management system is described in **Chapter 10**.

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-164

The activities carried out as part of the evaluation of the site and the results achieved are presented and described in this section of this TSSR. The databases are referenced in this section and form part of the GIS database that has been developed for this section. The results of the analysis are presented in the tables and in the drawings prepared for this section.

The following documents were compiled by the consultant and approved by Eskom to assist in quality assurance and to present a clear and auditable trail showing how key decisions were made and conclusions reached:

- SRK's Integrated Quality Management System and associated Work Instructions;
- The project-specific Project Quality Plan;
- Method Statement;
- Quality Control Plan;
- Project Process Chart.

The transportation, industrial and military facilities characterisation has followed a peer review process to ensure that the work is carried out using standard industry methodologies and approaches. The peer review was carried out by a suitably qualified, independent and experienced professional, approved by Eskom. Quality assurance is therefore demonstrated through the preparation of:

- a process chart containing reference to various data files;
- peer review reports.

Electronic records have been stored in a secure central repository with regular off-site backup procedures and subject to Eskom's approval. The overall quality system complies with **Chapter 10**. All references cited are saved on the central repository.

Table 5.7.36 lists the activities to be carried out as part of the investigation and characterisation of nearby transportation, industrial and military facilities with

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-165

their respective links to other TSSR sections/chapters and the relevant quality control requirements.

Table 5.7.36
Summary of Activities, Links and Quality Requirements

Activity	Links		Quality Requirements
	Inputs	Outputs	
Regional nearby transportation, civil, industrial and military facilities	<u>Section 5.1</u> (Geography and Site Location): Determination of the site centroid. <u>Section 5.5</u> (Land and Water Use): Determination of future industrial activity.	<u>Chapter 8:</u> Informs the development of the emergency response plan.	Drawings and figures illustrating the regional transportation network, airspace and air corridors, shipping lanes, harbours and other launching facilities. Tabulated summaries of data. Peer review.
Identification of external human-induced hazards		<u>Chapter 6:</u> Hazard source inventories and related data, which inform the evaluation of external hazards.	Hazard source maps and tabulated hazard inventories. Tabulated summaries of accident statistics. Peer review.

Table 5.7.37 sets out the regulatory compliance matrix which confirms that the regulatory requirements with respect to the identification and characterisation of external hazards have been met in this section of this TSSR.

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-166

Table 5.7.37
Regulatory Compliance Matrix

Act / Regulation	Regulation	Issue	Section Where Covered
Regulations on Licensing of Site (Department of Energy, 2011)	4(5)	Potential man-made hazards	<u>Subsections 5.7.13, 5.7.14 and 5.7.15</u>
Regulations on Licensing of Site (Department of Energy, 2011)	4(1) and 5(3)(a)	Factors relating to all nuclear installations in the site vicinity. Characteristics of the site in terms of external events and human-induced events	<u>Subsections 5.7.13, 5.7.14 and 5.7.15</u>
Regulations on Licensing of Site (Department of Energy, 2011)	5(3)(f)	Projections of future site characteristics	<u>Subsections 5.7.5.4, 5.7.5.6, 5.7.6.5, 5.7.7.2, 5.7.8.5, 5.7.9.8, 5.7.10.5, 5.7.12.3</u>
PP-0014	6	External human-induced events of accidental origin	<u>Subsection 5.7.15.1</u>
PP-0014	7	External hazard investigations should be identified by conducting site-specific and regional studies, based on published and unpublished scientific information from various provincial and state agencies, academic institutions, national building codes, industry, non-governmental, professional organizations and local communities.	<u>Subsections 5.7.5 to 5.7.16</u>
PP-0014	11.7	Air crash assessment	<u>Subsection 5.7.15.1</u>

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-167

Act / Regulation	Regulation	Issue	Section Where Covered
RG-0011	7.1(2), (14)	Historic data (frequency and severity) and future estimates of human-induced events.	<u>Subsection 5.7.15.1</u>
RG-0011	7.1(4)	Projections of future site characteristics	<u>Subsections 5.7.5.4, 5.7.5.6, 5.7.6.5, 5.7.7.2, 5.7.8.5, 5.7.9.8, 5.7.10.5, 5.7.12.3</u>
RG-0011	7.3.1	Air crash assessment	<u>Subsection 5.7.15.1</u>
RG-0011	7.3.2, 7.3.3	External fires, explosions and asphyxiant/corrosive/toxic gas releases	<u>Subsection 5.7.13</u> and <u>Subsection 5.7.15.1</u>
RG-0011	9.1(4)	Feasibility of emergency planning should be demonstrated.	<u>Subsections 5.7.6, 5.7.12, 5.7.13, 5.7.17, 5.7.18 and 5.7.19</u>

5.7.21 Conclusions

The main conclusions to be drawn from this investigation are:

- The characteristics of nearby transportation, industrial, civil and military facilities in the region of application have been identified.
- Current and expected future distribution of nearby transportation, industrial, civil and military facilities in the region of application have been determined.
- The storage and transportation of hazardous substances in the region of application have been identified.
- The potential sources of external hazards that may pose a risk to nuclear installation safety have been determined, including relevant stationary and mobile source.
- The studies have been conducted to an adequate level of detail for the purpose of **Chapter 6**.
- The studies have been conducted to an adequate level of detail for the purpose of **Chapter 8**.

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-168

- Appropriate monitoring programmes and controls, which include regular revision of this section of this SSR, to provide on-going assurance regarding the viability of the site over its lifecycle can be established in compliance with regulatory requirements.

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-169

5.7.22 References

1. ATNS, 2024. *ATNS: Eastern Cape Air Traffic Movements in the Site Region Dataset, Email 24 May 2024*, Johannesburg: ATNS.
2. BP, 2020. *Statistical Review of World Energy 69th Edition*. s.l.:BP.
3. Department of Energy, 2011. *R.927: The Regulations on Licensing of Sites for New Nuclear Installations*, Pretoria: Government Gazette, No. 34735.
4. Department of Environmental Affairs, 2010. *Oil Spill Contingency Plan No 10: Diaz Zone*. Pretoria, Department of Environmental Affairs.
5. Department of Environmental Affairs, 2020. *Coastal Oil Spill Contingency Plan: Humansdorp Zone*, Pretoria: Department of Environmental Affairs.
6. Department of Water and Sanitation, 2022. *Green Drop Report Eastern Cape 2022*, Pretoria: DWS.
7. Department of Water and Sanitation, 2023. *Algoa Status Report Prepared by Zutari (Pty) Ltd*, Pretoria: DWS.
8. Eastern Cape Industrial News, 2024. *Eastern Cape Industrial and Business*. [Online]
Available at: <https://easterncapeindustrialnews.co.za/manufacturing-output-ends-q2-24-weaker-but-recovery-expected-in-second-half-of-the-year/>
[Accessed 12 12 2024].
9. Eastern Cape Treasury, 2023. *EC Treasury*, Port Elizabeth: s.n.
10. Electric Power Research Institute, 2022. *Advanced Nuclear Technology: Site Selection and Evaluation Criteria for New Nuclear Energy Generation Facilities (Siting Guide): Technical Report*, Palo Alto: Electric Power Research Institute.
11. Eskom, 2008. *Civil Engineering Technical Report*, Johannesburg: Eskom.

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-170

12. Eskom, 2015a. *385924_TSSR 5.7 Nearby Transportation Rev 0_2015*, Cape Town: Eskom.
13. Eskom, 2015. *Thyspunt Site Safety Report Section 5.7 Rev. 0*, Cape Town: Eskom.
14. Eskom, 2019. *Nuclear Installation Site License Public Information Document for the Proposed Thyspunt Site*, Pretoria: National Nuclear Regulator.
15. Eskom, 2020. *Email received from Anita Kilian on Hazardous Substances Transported to KNPS*. Pretoria: Eskom.
16. Eskom, 2021. *Safety Classifications of SSR Production Processes, Rev.2 (NSIP02189)*, Johannesburg: Eskom.
17. Eskom, 2023. *Technical Requirement Specification: Revision and Update of the Thyspunt Site Safety Report, Rev. 2*, Cape Town: Eskom.
18. Eskom, 2024. *Thyspunt Site Safety Report Section 5.7 Rev0a*, Johannesburg: Eskom.
19. GoundUp, 2024. *GoundUp*. [Online] Available at: <https://groundup.org.za/article/school-buses-are-back-after-learner-picket/> [Accessed 19 December 2024].
20. Innovative Transport Solutions, 2024a. *Status Quo and Assessment of Existing Road and Infrastructure*, Cape Town: ITS.
21. Innovative Transport Solutions, 2024b. *Update of the Eskom Thyspunt Site Safety Report: Assessment, Road Infrastructure Upgrades and Proposals and the Evacuation Time Estimate*, Cape Town: Innovative Transport Solutions (Pty) Ltd.
22. International Atomic Energy Agency, 2002b. *Dispersion of Radioactive Material in Air and Water and Consideration of Population Distribution in Site Evaluations for Nuclear Power Plants. Safety Standard Series, Safety Guide No. NS-G-3.2*, Vienna: International Atomic Energy Agency.

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-171

23. International Atomic Energy Agency, 2019. *IAEA Safety Standards, Site Evaluation for Nuclear Installations, Specific Safety Requirements No. SSR-1*, Vienna: International Atomic Energy Agency.
24. International Atomic Energy Agency, 2021. *Design of Nuclear Power Installations against External Events excluding Earthquakes, Specific Safety Guide No. SSG-68*, Vienna: International Atomic Energy Agency.
25. International Atomic Energy Agency, 2023. *Hazards Associated with Human Induced External Events in Site Evaluation for Nuclear Installations, IAEA Safety Standards Series No. SSG-79*, Vienna: International Atomic Energy Agency.
26. International Maritime Organisation, 2018. *List of Special Areas, Emission Control Areas and Particular Sensitive Sea Areas*. London: IMO.
27. Kouga Local Municipality, 2018. *Kouga Local Municipality*. [Online] Available at: <https://www.kouga.gov.za/news/boat-launch-sites-to-be-re-registered> [Accessed 17 December 2024].
28. Kouga Local Municipality, 2019. *Kouga Local Economic Development Strategy*. Jeffreys Bay: Kouga Local Municipality.
29. Kouga Local Municipality, 2021a. *Humansdorp CBD Precinct Plan Draft Precinct Plan Report*, Jeffreys Bay: Kouga Local Municipality.
30. Kouga Municipality, 2024. e-mail_Haroon Prince <hprince@kouga.gov.za>599270_Thyspunt SSR_Request for Information_16 April 2024, Kouga: s.n.
31. Koukamma Local Municipality, 2024. e-mail Bramwill B. Prinsloo <bramwill.prinsloo@koukamma.gov.za>07 May 2024, Koukamma Local Municipality: s.n.
32. Mearns, K. O. a. J., 2012. *Shipping accidents along the South African Coastline*. s.l., s.n.
33. National Nuclear Regulator, 2008. *Requirements Document: RD-0034*:

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-172

Quality and Safety Management Requirements for Nuclear Installations, Rev. 0, Centurion: National Nuclear Regulator.

34. National Nuclear Regulator, 2012. *PP-0015: Emergency Planning Technical Basis for New Nuclear installations, Rev. 0, Centurion: National Nuclear Regulator.*
35. National Nuclear Regulator, 2014. *Position Paper: Considerations of External Events for New Nuclear Installations, PP-0014, Rev. 0, Centurion: National Nuclear Regulator.*
36. National Nuclear Regulator, 2016. *Regulatory Guide: Interim Guidance for the Siting of Nuclear Facilities, RG-0011, Rev. 0, Centurion: National Nuclear Regulator.*
37. National Nuclear Regulator, 2019. *Interim Guide on Safety Assessments of Nuclear Installations: RG-0019, Rev.0, Pretoria: National Nuclear Regulator.*
38. NSRI, 2023. *A place to call home.* [Online] Available at: <https://www.nsri.org.za/2023/08/a-place-to-call-home/> [Accessed 26 April 2024].
39. NSRI, 2024. *Base Showcase: Station 36 (Oyster Bay).* [Online] Available at: <https://www.nsri.org.za/2024/03/base-showcase-station-36-oyster-bay/> [Accessed 26 April 2024].
40. Planning Partners, 2024a. *Update of the Eskom Thyspunt Site Safety Report: Air Transportation in the 80km Radius, Cape Town: Planning Partners.*
41. Planning Partners, 2024b. *Marine Transport in the Site Region, Cape Town: Planning Partners (Pty) Ltd.*
42. Planning Partners, 2024c. *Industrial Development in the Site Region, Cape Town: Planning Partners (Pty) Ltd.*
43. Planning Partners, 2024d. *Storage of Hazardous Substances in the Site Vicinity, Cape Town: Planning Partners (Pty) Ltd.*

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-173

44. Planning Partners, 2024e. *Fires in the Thyspunt Site Vicinity*, Cape Town: Planning Partners (Pty) Ltd.
45. Planning Partners, 2024e. *Transportation of Hazardous Substances within the Thyspunt Site Vicinity*, Cape Town: Planning Partners (Pty) Ltd.
46. Planning Partners, 2024f. *Emergency Services in the Site Region*, Cape Town: Planning Partners.
47. Planning Partners, 2024g. *Drones in the Site Region (80 km)*, Cape Town: Planning Partners (Pty) Ltd.
48. Planning Partners, 2024. *Thyspunt SSR 5.7 Airfield Survey 2024: Completed by BD Culligan 22 February 2024*. Cape Town: Planning Partners.
49. Planning Partners, 2025. *Electricity Generation and Distribution within the Site Region*, Cape Town: Planning Partners (Pty) Ltd.
50. Republic of South Africa, 2003. *Occupational Health and Safety Act, 1993 (Act 85 of 1993): Explosives Regulations*, Pretoria: Government Printer.
51. Republic of South Africa, 2004. *Explosives Act No.15 (Act 15 of 2003)*, Pretoria: Government Printer.
52. Republic of South Africa, 2008. *Integrated Coastal Management Act of South Africa, 2008 (Act 24 of 2008)*, Pretoria: Government Printer.
53. Riscom, 2012. *Fire, Explosion and Toxic Vapour Cloud Impacts of Man induced Events from Transportation, Civil and Industrial Facilities near Thyspunt*, Johannesburg: Riscom.
54. SAMSA, 2024. *Casualty - Shipping Accidents SAMSA*. Cape Town: SAMSA.
55. Sarah Baartman District Municipality, 2022. *Integrated Development Plan 2022-2027*, s.l.: Sarah Baartman District Municipality.

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-174

56. South African Air Force, 2024. SAAF. [Online] Available at: <https://www.saairforce.co.za/the-airforce/bases/18/air-force-station-port-elizabeth> [Accessed 18 12 2024].
57. TNPA, 2022. *Port Development Framework Plans 2022 Update*, s.l.: Transnet National Ports Authority.
58. TNPA, 2024a. *Transnet National Ports Authority*. [Online] Available at: <https://www.transnetnationalportsauthority.net/OurPorts/Port%20Elizabeth/Pages/Overview.aspx> [Accessed 17 March 2024].
59. Transnet, 2019. *National Ports Plan*, Johannesburg: Transnet.
60. U.S. Department of Energy, 2006. *Accident Analysis for Aircraft Crash into Hazardous Facilities, Standard No. DOE-STD-3014-2006*, Washington DC: United States Department of Energy.
61. U.S. Department of Energy, 2024. *Country Analysis Brief: World Oil Transit Chokepoints June 2024*, Washington: U.S. Department of Energy.
62. U.S. Nuclear Regulatory Commission, 1978a. *Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants, Regulatory Guide No. 1.70, Rev. 3*, Washington DC: United States Nuclear Regulatory Commission.
63. U.S. Nuclear Regulatory Commission, 2007/2010. *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants. NUREG-0800. LWR Edition*, Washington DC: United States Nuclear Regulatory Commission.
64. U.S. Nuclear Regulatory Commission, 2021. *Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release, Regulatory Guide No. 1.78, Rev. 2*, Washington DC: U.S. Nuclear Regulatory Commission.
65. U.S. Nuclear Regulatory Commission, 2021. *Evaluations of Explosions*

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-175

Postulated to Occur on Transportation Routes near Nuclear Power Plants. Regulatory Guide 1.91. Rev. 3, Washington DC: United States Nuclear Regulatory Commission.

66. U.S. Nuclear Regulatory Commission, 2021. *Reactor Site Criteria, Title 10 of the Code of Federal Regulations Chapter I, Part 100*, Washington DC: US Nuclear Regulatory Commission.
67. U.S. Nuclear Regulatory Commission, 2024. *Regulatory Guide 4.7, General Site Suitability Criteria for Nuclear Power Stations Rev. 4*, Washington: US:NRC.
68. US Energy Information Administration, 2024. *World Oil Transit Chokepoints*, Washington: US Energy Information Administration.
69. Venues, S., 2024. *Brakkeduin 4x4 Trail*. [Online] Available at: <https://www.sa-venues.com/things-to-do/easterncape/brakkeduine-4x4-trail/> [Accessed 25 April 2024].
70. VesselTracker / Wood MacKenzie, 2022. *Vessel Movement past rhe Site Data*. Hamburg: VesselTracker / Wood MacKenzie.
71. Woodridge College, 2023. *Woodridge College and Preparatory School*. [Online] Available at: <https://www.woodridge.co.za/assets/BUSES/Woodridge-College-and-Prep-Bus-Fees-and-Routes-2023-update.pdf> [Accessed 19 December 2024].

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-176

Appendix 5.7.A: Fertilizer Delivered and / or stored on Farms in the Site Vicinity (2024)

Farms (Farming Unit)	Inventory (per year)		Distance (km)	Direction
	Type	Volume (t)		
3/735, RE/735, 2/735	1:0:1, Mixed (Phosphate, potassium, nitrogen, sulphur, lime)	205	2.5 km to 5.0 km	N
10/735	Mixed (Phosphate, potassium, nitrogen, sulphur, lime)	42.5	2.5 km to 5.0 km	NW
14/24	2:3:4	12.5	2.5 km to 5.0 km	ENE
5/743, 7/742	Urea, 1:0:1, Mixed (Phosphate, potassium, nitrogen, sulphur, lime)	59.5	2.5 km to 5.0 km	NNE
10/742, 12/742	Urea, 1:0:1	34	2.5 km to 5.0 km	NE
5/733, 33/732	Organic, KCL, 3:0:1, MAP	256	5.0 km to 7.5 km	WNW
2/742	Urea, 1.0.1	17	5.0 km to 7.5 km	NE
32/713, 14/713	2:3:4	25	5.0 km to 7.5 km	NNE
4/733, 3/733, 737, RE/946, 10/733	MAP, 3:0:1, KCL, Organic	549	5.0 km to 7.5 km	NW
6/732	1:0:1	100	7.5 km to 10.0 km	WNW
RE/712, 2/687	LAN, Urea, Potassium Chloride, MAP	58	7.5 km to 10.0 km	NNE
RE/8/713, 21/687	2:3:4, Organic, Lime, Gypsum, Langfos, Urea, Compost	630.5	7.5 km to 10.0 km	N
27/732, 945, 4/715, 14/732	MAP, 3:0:1, Mixed (Phosphate, potassium, nitrogen, sulphur, lime)	294	7.5 km to 10.0 km	NW

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-177

Farms (Farming Unit)	Inventory (per year)		Distance (km)	Direction
	Type	Volume (t)		
798, 6/717, 8/717, 4/722, 11/722, 3/723, 5/732, 18/732, 799, RE/13/722, 14/722, 10/717, 10/722, 12/722, 2/717, 9/717, 828, 11/717, 5/717	Organic, 1:0:1, 1:1:1, 1:0:3, 3:0:1	1 011.08	10.0 km to 16.0 km	WNW
1/723, 724, 725	Organic, 1:0:1, 1:1:1, 1:0:3	141.66	10.0 km to 16.0 km	W
4/912, 5/912, 709, 1/868, RE/868	LAN, Urea, Potassium Chloride, MAP, 3:0:1, Organic, Phosphate	407.8	10.0 km to 16.0 km	NE
5/687, 2/803, 711, 10/688, 25/688, 6/912, RE/912, 2/912, 1/912, 3/912, RE/688, 15/689, 2/689	LAN, Urea, Potassium Chloride, MAP, 3:0:1, 1:0:1	609	10.0 km to 16.0 km	NNE
756, 5/348, 1/681, 12/348, 6/348	MAP	76	10.0 km to 16.0 km	N
15/681, RE/684, 846, RE/681, RE/682, RE/684	MAP, Potassium Chloride, KAN, Ammonia, Urea, 2:3:4, Langfos, Lime, Gypsum, Compost	2 000	10.0 km to 16.0 km	NNW
6/715, 4/716, RE/677, RE/715, 2/716, 5/716, 3/717, RE/716, 2/677	Organic, 1:0:1, 1:1:1, 1:0:3, Urea, Lime, Gypsum, Langfos, Potassium Chloride, Nitrogen.	2 827.62	10.0 km to 16.0 km	NW
Total		9 356.16	0.0 km to 16.0 km	
(Inorganic = 5 926.16 t and organic = 3 430 t)				

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-178

Appendix 5.7.B: Aircraft Data for CDSIA

Aircraft Type, Maximum Take off Weight, Maximum Fuel Capacity and Average Monthly Movements (January 2009 to December 2023)

Aircraft Type	Maximum Take-off Weight (kg)	Maximum Fuel Capacity (t)	Average Number of Movements per Month
A-1 Skyraider	8 343	1 438	0.006
Agusta AW-109	2 850	597	1.678
Agusta AW-119 Koala	2 850	605	2.200
Agusta AW-139	6 400	1 568	0.122
Airbus A319	75 500	24 210–30 190	0.300
Airbus A320	78 000	24 210–27 200	0.117
Airbus A330 200	230 000	139 090	0.017
Airbus A340-200	275 000	155 040	0.022
Grumman American AA-1B Trainer & Tr2	708	91	1.639
American General AG-5B Tiger	1 089	190	0.011
Rockwell Commander 114	1 425	265	0.106
Rockwell Aero Commander 500	3 062	601	0.022
Twin Commander 690 Jetprop Commander 900	4 785	1 609-1 794	2.939
Twin Commander 695 Jetprop Commander 1000	5 080	1 825	0.056
Aerostar 600	2 495	625	0.122
Aerospatiale SE 3130 Alouette 2	1 600	580	0.572
Aerospatiale SE 3160 Alouette 3	2 100	565	0.183
Antonov An-26	24 000	6 800	0.011
Antonov An-32	27 000	7 100	0.011
Aerospatiale AS-332B1 Super Puma	7 600	1 540	1.139
Eurocopter AS350 B3	2 250	540-475	0.006
Eurocopter AS550 Fennec	2 250	540-475	8.250
Air Tractor AT-402B	4 159	644	0.006

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-179

Aircraft Type	Maximum Take-off Weight (kg)	Maximum Fuel Capacity (t)	Average Number of Movements per Month
Air Tractor AT-802A	7 257	961	0.156
Bell/ Agusta AB-206B-3 JetRanger	1 452	345	9.889
Bölkow BO-105 CBS4	2 500	570	4.178
Beagle B121 Pup-150 Series 2	873	109-155	0.044
Beechcraft 1900D	7 764	2 517	0.106
Bell 205	4 300	830	0.028
Bell 206	2 064	419	1.017
Bell 212	5 080	831	0.067
Bell 222B	3 742	712	0.011
Bell 230	3 810	931-182	0.017
Beechcraft 300 (B300) King Air 350	6 804	1 638	0.261
Bonanza A36	1 739	432	0.706
Bell 407	2 722	483-72	2.572
Bell/ Agusta AB-412	5 398	1 249-617	0.017
Bell 430	4 218	712-182	0.033
British Aerospace BAe-146-200	42 201	12 904	0.011
Bell 505 Jet Ranger X	2 030	321	0.011
Boeing 707-320C	151 500	90 301	0.006
Boeing 707-120B	117 000	60 600	0.006
Boeing 727-100	76 839	29 269	0.006
Boeing 727-200	92 126	30 677	2.144
Boeing 737-200	54 204	19 531	21.994
Boeing 737-300	63 276	23 827	46.561
Boeing 737-400	65 091	23 827	50.011
Boeing 737-500	60 555	21 964	0.106
Boeing 737-700	70 808	26 022	9.022
Boeing 737-800	79 016	26 022	45.794
Boeing 747-400	396 894	215 991	0.072
Boeing 767-200	159 210	77 752	0.011

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-180

Aircraft Type	Maximum Take-off Weight (kg)	Maximum Fuel Capacity (t)	Average Number of Movements per Month
Boeing 767-300	185 066	91 380	0.028
Beechcraft King Air 100	5 352	1 779	0.944
Beechcraft Super King Air B200	5 670	2 078	3.256
Beechcraft Sundowner C23	1 111	226	0.683
Beechcraft King Air 360	6 804	2 040	0.033
Beechcraft Bonanza F33A	1 542	280	0.050
Beechcraft Bonanza V35B	1 542	280	2.472
Beechcraft King Air 350	6 804	2 040	0.028
Beech Bonanza A36	1 656	280	2.839
Beechcraft Hawker 400XP	7 394	2 775	0.344
Beechcraft Baron C55	2 404	424-538	0.622
Beechcraft Baron 58	2 449	515	14.711
Beechcraft Duke 60	3 050	538	0.039
Beechcraft Duchess 76	1 769	379	14.289
Beechcraft Travel Air B95	1 860	303	0.017
Beechcraft King Air E90	4 581	1 794	3.061
Beechcraft King Air F90	4 967	1 779	0.944
Eurocopter/ Kawasaki BK-117	3 350	605	20.961
Bushbaby	450	100	0.022
Cessna 120	658	95	0.089
Lockheed Hawker C-130	70 310	26 344-30 501	0.217
Cessna 140	680	79	1.422
Cessna Aerobat A150M	726	98	42.089
Cessna Aerobat A152	757	98	488.772
Boeing C-17 Globemaster III	265 350	82 125	0.017
Cessna 170	998	159	0.033
Cessna 172F	1 043	159	70.067
Cessna 175	1 066	197	0.061
Cessna 177 Cardinal	1 066	185	0.583

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-181

Aircraft Type	Maximum Take-off Weight (kg)	Maximum Fuel Capacity (t)	Average Number of Movements per Month
Cessna 180K	1 270	333	0.006
Cessna T182T	1 406	348	5.594
Cessna A185F II Skywagon	1 520	333	0.022
Cessna A188 AG Wagon	1 814	204	0.011
Cessna 195	1 520	303	0.017
Cessna T206H Turbo Stationair	1 633	333	1.544
Cessna T207	1 724	231	0.078
Cessna Caravan 208B Grand	3 969	1 268	4.311
Cessna T210N Centurion Turbo	1 814	341	4.561
Airbus C-212 CB	6 500	2 074	0.022
Cessna T303 Crusader	2 268	587	0.250
Cessna T310R II	2 495	386	0.456
Cessna 335 II	2 717	386	0.006
Cessna 337A Skymaster	1 905	352	0.011
Cessna 340A II	2 717	386	0.022
Cessna 402A	2 858	386	0.372
Cessna 404 Titan Ambassador II	3 810	1 317	0.156
Cessna 414	2 880	386	1.033
Cessna 421C Golden Eagle III	3 379	806	0.578
Cessna 425 Conquest I	3 900	1 385	0.039
Cessna 441 Conquest II	4 468	1 798	0.022
Basler Turbo-67	13 000	6 000	0.006
Cessna 500 Citation I	5 375	2 135	0.128
Cessna 501 Citation I/SP	5 375	2 130	0.156
Cessna 510 Citation Mustang	3 921	1 457	0.172
Cessna 525 Citation Jet CJ1	4 717	1 806	0.472
Cessna S550 Citation SII	6 849	3 308	1.089
Cessna 560 Citation V	7 212	3 270	0.222
Cessna 560XL	9 222	3 829	0.056

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-182

Aircraft Type	Maximum Take-off Weight (kg)	Maximum Fuel Capacity (t)	Average Number of Movements per Month
Cessna 650 Citation III	9 979	4 142	0.006
Cessna 680 Citation Sovereign	13 970	6 435	0.222
Cessna 172RG II Cutlass	1 202	250	18.139
Cessna 750 Citation X	16 375	7 306	0.006
Cessna 177RG Cardinal	1 270	231	0.039
Cessna R182RG Skylane II	1 406	348	0.011
Zenair CH-100 Mono-Zénith	500	55	0.000
Zenair CH-300 Tri-Zénith	839	129	0.000
Bombardier BD-100 Challenger 300	17 622	7 995	0.139
Bombardier CL-600 Challenger 650	23 133	8 136	0.189
Cozy III	690	189	0.006
Canadair CL-600 Regional Jet CRJ-100	24 041	8 081	0.111
Canadair CL-600 Regional Jet CRJ-200	24 041	8 081	116.217
Canadair CL-600 Regional Jet CRJ-700	34 019	10 997	4.889
Canadair CL-600 Regional Jet CRJ-900	37 995	10 997	0.017
Diamond DA42 Twin Star	1 785	288	0.111
McDonnell Douglas DC-10-40	251 744	138 742	0.089
Douglas DC-3 (turbine)	13 154	3 907	0.283
Douglas DC-9-30	49 900	13 900	0.072
De Havilland DH-82 Tiger Moth	828	86	0.322
Bombardier Q300	19 505	3 161	0.028
Bombardier Q400	29 257	6 526	92.228
Diamond DA20-A1 Katana	730	76	0.006
Embraer EMB-120 Brasília	11 500	2 660	0.061
Embraer ERJ-135	20 000	6 397	12.778
Embraer ERJ-145	22 000	6 397	0.767
Embraer 170	38 600	11 625	0.300
Embraer Lineage 1000	54 500	27 240	19.522
Embraer 195	52 290	16 156	0.011

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-183

Aircraft Type	Maximum Take-off Weight (kg)	Maximum Fuel Capacity (t)	Average Number of Movements per Month
Extra 330LT	950	220	0.022
Embraer EMB-135BJ Legacy	22 000	10 400	0.006
Embraer EMB-500 Phenom 100	4 800	1 586	0.056
Embraer EMB-505 Phenom 300	8 150	3 028	0.033
Eclipse Total Eclipse 500	2 722	950	0.033
Airbus Helicopters EC-120 Colibri	1 715	490	0.444
Airbus Helicopters EC-130	2 500	540	0.144
Eurocopter EC-135	2 835	701	0.061
Airbus Helicopters-Kawasaki H-145	3 600	760	0.061
Tecnam P92 Eaglet	600	90	0.506
Enstrom 280FX Shark	1 179	151	0.011
Enstrom 480B	1 361	341	0.033
Fokker 100	45 810	13 366	0.006
Alenia Aermacchi SF-260	1 300	235	0.006
Fokker F-28 Fellowship	33 112	10 860	0.039
Dassault Falcon 2000EX Easy	19 142	9 411	0.811
Cessna F406 Caravan II	4 468	1 798	0.189
Fokker 70	41 730	13 366	0.017
Dassault Mystère Falcon 900	21 092	10 836	0.150
Dassault Mystère Falcon 10	8 755	3 358	0.011
Dassault Mystère Falcon 20	13 755	5 178	0.017
Dassault Mystère Falcon 50	18 500	8 815	0.194
Dassault Falcon 7x	33 112	19 966	0.056
Grob G-109	850	100	0.039
Grob G-115	990	150	0.006
Grumman G-159 Gulfstream I	15 921	5 459	0.028
Guimbal G-2 Cabri	700	170	0.050
Remos G-3	600	83	0.017
Gippsaero GA-8 Airvan	1 814	349	1.056

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-184

Aircraft Type	Maximum Take-off Weight (kg)	Maximum Fuel Capacity (t)	Average Number of Movements per Month
Aerospatiale SA-342 Gazelle	1 800	730	0.656
Game Composites GB-1 GameBird	998	307	0.161
Globe GC-1 Swift	776	114	0.006
Bombardier BD-700 Global 5000	41 957	22 179	0.011
Bombardier BD-700 Global 7500	52 096	23 395	0.022
Bombardier BD-700 Global Express	44 452	25 410	0.244
Grumman G-1159 Gulfstream II	28 123	10 504	0.022
Gulfstream Aerospace Gulfstream III	31 615	12 757	0.006
Gulfstream Aerospace Gulfstream IV	33 203	13 300	0.067
Gulfstream Aerospace Gulfstream V	41 050	23 333	0.217
Gulfstream Aerospace Gulfstream G650	45 178	24 984	0.011
Hawker Siddeley HS-125-1	10 342	4 660	0.044
Hawker 900XP	12 701	4 539	0.272
Hawker 1000A	14 107	6 462	0.011
Hawker Beechcraft Corp 4000	17 917	8 252	0.067
BAe Systems Hawk	9 100	2 795	0.272
Fairchild Dornier 328 Jet	15 200	4 542	0.017
Jabiru J200	750	100	0.061
Jabiru J120	500	65	7.111
British Aerospace BAe Jetstream 41	10 886	3 305	51.406
Boeing KC-135R Stratotanker	146 000	118 389	0.006
Lockheed L-100-30	70 307	36 643	0.006
Aero L-29 Delfin	3 500	1 500	0.483
Lockheed Jetstar II	20 185	10 149	0.017
Aero L-139 Albatros	5 600	1 050	1.500
Aermacchi AL-60	2 275	345	0.017
Learjet 31	7 400	3 035	0.078
Learjet 36	8 301	4 202	0.028
Learjet 45	9 299	3 422	1.500

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-185

Aircraft Type	Maximum Take-off Weight (kg)	Maximum Fuel Capacity (t)	Average Number of Movements per Month
Learjet 55	9 752	3 789	0.011
Learjet 60	10 659	4 467	0.022
Lancair 200	800	200	0.217
Agusta Westland AW-159 Lynx Wildcat	5 330	1 298	0.311
Mooney M-20F Executive 21	1 243	242	0.939
Mooney M-20M TLS	1 528	363	0.094
Maule M-7-235	1 134	151	0.006
Dyn'aero MCR-4	700	120	0.017
McDonnell Douglas MD-82	67 800	22 107	8.511
McDonnell Douglas MD-83	79 686	26 426	2.628
McDonnell Douglas MD-87	67 812	26 422	1.983
Piaggio Aero P.149D	1 680	235	0.028
Piaggio Aero P.180 Avanti Evo	5 489	1 271	0.006
Cessna 210 Centurion	1 814	329	0.033
Piper PA-28-180G Cherokee	1 089	189	191.228
Piper PA-28-236 Dakota	1 361	273	0.483
Piper PA-28R-180 Arrow	1 134	189	24.889
Piper PA-28RT-201 Arrow IV	1 247	273	0.006
Piper PA-32R-300	1 633	356	0.028
Piper PA-46-500TP Meridian M500	2 310	644	0.100
North American P-51 Mustang	5 490	1 018	0.061
Piaggio Aero P.166AL1	3 681	833	0.067
Vulcanair P68TC Observer	2 084	670	0.200
Pacific Aerospace P-750 XSTOL	3 402	837	0.011
Piper PA-18-150 Super Cub	794	136	0.100
Piper PA-20-125 Pacer	816	136	0.006
Piper PA-22-160 Tri-Pacer	907	136	0.061
Piper PA-23-160H Apache	1 724	273	0.017
Piper PA-24-260 Comanche	1 315	341	0.067

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-186

Aircraft Type	Maximum Take-off Weight (kg)	Maximum Fuel Capacity (t)	Average Number of Movements per Month
Piper PA-25-260D Pawnee	1 315	144	0.011
Piper PA-23E Aztec	2 359	545	0.011
Piper PA-30 Twin Comanche	1 633	341	8.678
Piper PA-31 Navajo	2 948	719	1.272
Piper PA-32 Cherokee Six	1 542	318	4.494
Piper PA-34 Seneca	2 155	462	7.706
Piper PA-38 Tomahawk	758	114	0.050
Piper PA-44 Seminole	1 724	416	23.911
Piper PA-46 Malibu	2 310	454	0.439
Piper PA-31T-620 Cheyenne II	4 082	1 446	0.044
Pilatus PC-12/47E	4 740	1 522	3.894
Pilatus PC-24	8 300	3 369	0.117
Pilatus PC-6	2 800	1 128	0.206
Pilatus PC-7	2 700	473	0.444
Pipistrel LSA S R L Virus SW	600	98	0.089
Beechcraft Premier 1A	5 670	2 071	1.267
Aviat Pitts S-2C	737	110	0.028
Aerospatiale SA-330 Puma	7 627	1 540	0.039
Robinson R22	621	105	92.478
Robinson R44	1 134	185	73.617
Robinson R66	1 361	279	0.117
Alpha Aviation R-2160 Alpha 160	1 984	180	0.267
Socata Rallye 235	1 200	150	0.017
Avro RJ85	43 999	11 355	2.944
Van's RV-10	1 225	227	0.422
Van's RV-6	726	144	0.522
Van's RV-7	816	159	7.133
Van's RV-8	816	159	0.011
Van's RV-9	794	136	1.378

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-187

Aircraft Type	Maximum Take-off Weight (kg)	Maximum Fuel Capacity (t)	Average Number of Movements per Month
Denel AH-2 Rooivalk	8 750	1 855	0.033
Stinson 108 Voyager	1 089	189	0.006
Schweizer 269D 333	1 157	276	0.011
Sikorsky S-61R	10 000	2 585	0.011
Sikorsky S-76D	5 307	1 120	0.122
SAAB 39 Gripen	12 900	2 270	0.072
Cirrus Vision SF-50	2 722	1 117	0.061
Airplane Factory Sling 2	600	150	0.072
Sling Aircraft Sling 4	920	168	0.200
Cirrus SR-20	1 361	231	0.283
Cirrus SR-22	1 542	307	1.267
Boeing Stearman 75 Kaydet	1 195	174	0.044
Sukhoi Su-31	1 100	289	0.006
Fuji T-1	5 000	2 300	0.006
Thorp S-18	726	110	0.117
North American T-28 Trojan	3 856	674	0.017
North American T-6 Texan	2 548	530	0.089
Socata TBM 700A	2 984	1 067	0.044
Bell UH-1 Iroquois "Huey"	4 309	799	0.056
Velocity SE	1 043	227	0.006
Vulcanair AP-68TP-600 A-Viator	3 000	840	5.900
Yakovlev Yak-18	1 320	284	0.694
Yakovlev Yak-52	1 305	121	0.667
Aircraft type not (yet) assigned a designator	Unknown	Unknown-	0.011
Total			1 713.018

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-188

Appendix 5.7.C: Eskom EIA Data Set for Expected Inventory of Hazardous Substances Stored at the Thyspunt Site (2008)

	Unit	Envelope
Auxiliary Steam Boiler		
Auxiliary steam boiler (x3)	t/h	32
Diesel storage tanks (x2)	m ³	230
Chlorination		
Circulating Water System (CRF, main cooling water)		
Normal operation-continuous	mg/kg	2.00
Shock (3 x /day for 15 min)	mg/kg	4.00
Continuous consumption rate	kg	13 565
Shock consumption rate	kg	848
Total consumption rate	kg	14 413
SEN (auxiliary cooling water)		
Normal operation-continuous	mg/kg	2.00
Shock (3 x /day for 15 min)	mg/kg	4.00
Continuous consumption rate	kg	656
Shock consumption rate	kg	41
Total consumption rate	kg	697
Hydrogen Plant (H ₂)		
H ₂ Plant/unit	Nm ³ /h @ 25 Bar	15
4 x Storage tanks	Nm ³	30

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-189

	Unit	Envelope
Demineralisation Plant		
Units	each	2
Capacity per unit	m ³ /day	2 000
Conductivity of water	S/cm	0.2 x 10 ⁶
Silica SiO ₂	g/l	20 x 10 ⁶
Sodium	g/l	1 x 10 ⁵
Suspended solids	g/l	50 x 10 ⁶
Fuel (Nuclear)		
Enrichment of fuel (by weight)	%	4.95
Rods/assembly	each	265
Assemblies/load	each	241
Fuel active height	m	4.20
Fuel assembly pitch	m	0.215
Mass of fuel rod	kg	2.80
Mass of assembly	kg	780
Total assembly mass in reactor	ton	187.98
Duration of fuel in reactor	months	18
Spent fuel over lifecycle (approximate)	ton	1 880

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-190

	Unit	Envelope
Gas Turbines		
General Specifications		
Gross output power (2 off)	MW	25.30
Gross efficiency	%	34.00
Fuel mass flow	kg/s	1.74
Exhaust Gas		
Exhaust gas mass flow	kg/s	85
Exhaust gas temperature	°C	538
Gas Composition		
N ₂	%Vol	74.80
O ₂	%Vol	13.90
CO ₂	%Vol	4.20
H ₂ O	%Vol	6.20
Ar	%Vol	0.90
SO ₂	%Vol	0.00

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-191

	Unit	Envelope
Non-radioactive Releases (Operational Phase)		
Gas		Ventilation
Gas exit volume	m ³ /min	
Exit gas velocity (normal)	m/s	5.80
Exit gas velocity (outage)	m/s	6.35
Gas Turbine Exhaust Gas		
Exhaust gas mass flow	kg/s	85
Exhaust gas temperature	°C	538
Gas Composition		
N ₂	%Vol	74.80
O ₂	%Vol	13.90
CO ₂	%Vol	4.20
H ₂ O	%Vol	6.20
Ar	%Vol	0.90
SO ₂	%Vol	0.00

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-192

Appendix 5.7.D: Aircraft Incidents and Accidents withing the Site Region

Table 5.7.B.1: Historical Data on Aircraft Incidents and Accidents within the Site Region (January 2008 to December 2023)

Date	Aircraft			Incident of Accident Location	Distance and Direction from Site ¹⁴	Reason for Accident	Application
	Type	Propeller, Jet or Heli	Mass				
2023 (3 Reports)							
2023/11/06	Sling II	Prop	<5.7t	Chief Dawid Stuurman International Airport	87.45 km ENE	Human error. The student pilot lost control of the aircraft whilst attempting to land at a higher-than-normal approach speed.	Training
2023/11/01	Beechcraft B1900D	Prop	<5.7t	Chief Dawid Stuurman International Airport	87.45 km ENE	Cargo failure. The aircraft carried dangerous goods in plastic containers, one of which leaked fluid onto the parking bay and damaged the surface.	Commercial (Cargo)
2023/02/13	Windlass Aquilla Trike	Prop (microlight)	<5.7t	Paradise Beach Airfield	20.21 km ENE	Human error. The microlight's speed was too low during landing, which led to a stall, followed by a hard landing.	Private
2022 (3 Reports)							
2022/08/23	Sling 2	Prop	<5.7t	Chief Dawid Stuurman International Airport	87.45 km ENE	Human error. Hard landing which damaged the nose gear.	Training
2022/08/11	Mooney M-20M	Prop	<5.7t	Chief Dawid Stuurman International Airport	87.45 km ENE	Human error. Landing gear was not deployed with landing.	Private
2022/01/12	Cessna 182P	Prop	<5.7t	Uitenhage area while flying at ±900 feet above ground level.	77.20 km NE	A bird struck the vertical stabiliser during flight.	Training
2021 (3 Reports)							
2021/10/13	Robinson 22 Beta II	Heli	<5.7t	Chief Dawid Stuurman International Airport	87.45 km ENE	Equipment failure. Loss of engine power during hover a exercise as a result of a loose insert which houses the ball in the rod end of the throttle control overtravel spring.	Training
2021/07/05	Sling 2	Prop	<5.7t	Seaview Airfield	63.50 km ENE	Equipment failure. The pilot decided to shut down the engine and glided the aircraft to Seaview Airfield.	Private
2021/02/02	See Note 1	See Note 1	See Note 1	Chief Dawid Stuurman International Airport	87.45 km ENE	Human error – poor landing technique. Flight test for the commercial licence of the student. On their return and after landing on Runway 08 on a landing roll, the left main gear collapsed. The aircraft veered off to the left before coming to rest on the grass.	Training
2020 (1 Report)							
2020/10/30	Zenith CH650	Prop	<5.7t	Paradise Beach Airfield	20.17 km ENE	Unknown cause. Engine power loss during a descent for landing which was likely caused by the carburettor icing, resulting in an engine splatter and vibration and a subsequent unsuccessful forced landing.	Private
2019 (4 Reports)							
2019/11/29	Cessna 206C	Prop	<5.7t	Chief Dawid Stuurman International Airport	87.45 km ENE	Equipment failure. The No 4 connecting rod had failed due to excessive heat that was concentrated on the No 4 camshaft journal area as a result of oil starvation.	Private (Aerial work)
2019/08/16	See note 1	See note 1	See note 1	Chief Dawid Stuurman International Airport	87.45 km	Human error. The pilot reported that he lost control of the aircraft during a crosswind landing.	See note 1

¹⁴ Distance and direction presented in Appendix 5.7.D is based on a straight line measurement from the site centroid to a co-ordinate provided in the Civil Aviation Authority's Accident Reports. These distances and directions might differ from those presented to spatially locate the airport or airfield within the site region. The latter distance and direction is determined by a straight line measurement from the site centroid to a midpoint on the airfields runway/s.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section- Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-193

Date	Aircraft			Incident of Accident Location	Distance and Direction from Site ¹⁴	Reason for Accident	Application
	Type	Propeller, Jet or Heli	Mass				
					ENE		
2019/07/25	See note 1	See note 1	See note 1	Progress Airfield	71.94 km ENE	Human error. The pilot initially reported that at the end of the landing roll, the aircraft experienced a 50 kts cross wind, which caused the aircraft to lift its tail and the propeller impacting the ground. He later reported that the accident was caused by his mistake in braking hard during a landing roll.	See note 1
2019/04/13	See note 1	See note 1	See note 1	Beulah Airfield	38.05 km NE	Human error. It was reported that the aircraft landed hard following and unstable approach due to a speed being at 72 kts and the required speed is 60 kts.	See note 1
2018 (7 Reports)							
2018/11/11	ELA-08	Heli	<5.7t	Paradise Beach Airfield	20.21 km ENE	A gust of wind induced a low speed main rotor blade flap which caused the main rotor blades to contact the propeller blades and the tail section resulting in an aborted take-off.	Private
2018/11/10	Vulcanair P.68R	Prop	<5.7t	Progress Airfield	71.94 km ENE	Unknown cause. The nose gear collapsed on landing as a result of the extended nose gear not locked. The failure of the down lock mechanism was undetermined as the system operated normal during testing.	Training
2018/08/19	See note 1	See note 1	See note 1	Uitenhage Airfield	79.15 km NE	Human error. Aircraft veered off the runway during a touch and go landing roll following a dislodged tight making landing gear.	See note 1
2018/07/22	Robinson R22	Heli	<5.7t	Chief Dawid Stuurman International Airport	87.45 km ENE	Human error. The helicopter landed hard following a transition from a hover with insufficient left pedal input.	Training
2018/06/11	Cozy Fish Eagle	Prop	<5.7t	Braakens Valley, 1 nmi northeast of Chief Dawid Stuurman International Airport	Outside 80 km	Equipment failure. Unsuccessful forced landing following an inflight engine failure as a result of a failed distributor drive gear. The distributor drive gear teeth failed and caused disruption in the engine ignition timing system leading to the engine stoppage.	Private
2018/05/04	Sling 2	Prop	<5.7t	Chief Dawid Stuurman International Airport	87.45 km ENE	Equipment failure. The nose landing gear strut assembly collapsed during landing.	Private
2018/01/06	See note 1	See note 1	See note 1	Chief Dawid Stuurman International Airport	87.45 km ENE	Human error. During the second "touch and go," the aircraft bounced, leading to the pilot losing control and subsequently veering off Runway 26.	See note 1
2017 (1 Report)							
2017/01/07	See note 1	See note 1	See note 1	Farm Beauna Vista	47.49 km N	Equipment failure. The pilot mentioned that after taking off from the pilot's farm, they were unable to attain altitude and found themselves behind the drag curve.	See note 1
2016 (0 Reports)							
2015 (6 Reports)							
2015/12/16	See note 1	See note 1	See note 1	Palmietvlei Mountain, 13.18 nmi west of Humansdorp	11.55 km NNW	Human error. The pilot lost control and the aircraft impacted the mountain.	See note 1
2015/11/07	Piper PA-28-180	Prop	<5.7t	Chief Dawid Stuurman International Airport	87.45 km ENE	Equipment failure and human error. Unsuccessful forced landing due to engine failure. The accident was a result of non-adherence to standard set emergency procedure as prescribed in the pilot operating handbook.	Training
2015/11/06	See note 1	See note 1	See note 1	On an open field close to Progress Airfield	64.65 km ENE	Unknown cause. The pilot then elected to execute a forced landing on an open field when the aircraft collided with an electrical pole.	See note 1

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-194

Date	Aircraft			Incident of Accident Location	Distance and Direction from Site ¹⁴	Reason for Accident	Application
	Type	Propeller, Jet or Heli	Mass				
2015/09/04	Magni Gyrocopter M16	Heli	<5.7t	±500 m from Patensie Airfield	49.81 km N	Human error. Pilot flew into high terrain where he conducted a low level flight. Main rotor blades struck the trees and the pilot lost control of the aircraft prior to it impacting with the ground and caught fire.	Private
2015/03/25	Gyrocopter RAF 2000 GTX SE FI	Heli	<5.7t	In bushy terrain outside the Uitenhage Airfield.	74.19 km NE	Equipment failure and human error. The aircraft accident was due to rotor contact with the propeller during flight. The pilot also disregarded the standard safety oversight.	Private
2015/02/17	Robinson R44 Helicopter	Heli	<5.7t	Private farm at Humansdorp.	28.19 km N	Human error. The helicopter experienced a dynamic roll over during take-off, attributable to heavy weight.	Commercial
2014 (6 Reports)							
2014/09/02	Hawker Beech 390 & Robinson R22 helicopter	Jet & Heli	<5.7t	On descent into Chief Dawid Stuurman International Airport	87.45 km ENE	Human error. The student controller failed to take corrective action when the pilot of one of the aircraft read back the incorrect altitude. This resulted in a loss of separation between the two aircraft in both the horizontal and vertical plans.	Private & Training
2014/07/10	Bombardier CL600/Airbus A320	Jet	>5.7t	Overhead Gqeberha (S33°59'38.02" E25°35'35.30"	Outside 80 km	Human error. The Bombardier was cleared on final approach for runway 26 of Chief Dawid Stuurman International Airport with the intention to do a full stop landing when the Airbus was cleared for immediate take-off by the controller, with no stopping on the runway ahead of the aircraft on approach. The Bombardier elected to do a go-around due to insufficient separation between them and the Airbus. The controller did not effectively monitor the flight progress of the aircraft on final approach, which resulted in a loss in separation, resulting in evasive action being taken by the crew of the Bombardier.	Commercial
2014/07/02	Sling 2	Prop	<5.7t	Chief Dawid Stuurman International Airport	87.45 km ENE	Human error. A student pilot was engaged on a solo flight. During the approach for a landing, the aircraft was reported to be too slow in speed in strong crosswinds. On touch down, the aircraft bounced and the student pilot lost control of the aircraft. During an attempt to recover the aircraft, the aircraft landed on its nose and the nose wheel collapsed.	Training
2014/05/25	Raptor Microlight	Prop	<5.7t	Uitenhage Airfield	79.15 km NE	Equipment failure. Unsuccessful forced landing following an engine power loss in flight due to engine component (coil) failure.	Private
2014/05/14	See note 1	See note 1	See note 1	Uitenhage Airfield	79.15 km NE	Equipment failure. During the round-out at an altitude ranging from 10 to 15 ft above the ground, the indicated speed was 110 km/h. Despite the student's continued attempt to flare, the glider did not respond to the control input, resulting in a hard touchdown with the engine still running.	Training
2014/03/28	See note 1	See note 1	See note 1	Chief Dawid Stuurman International Airport	87.45 km ENE	Human error. The student pilot reported that during the approach for landing, the aircraft was at a higher altitude than intended and subsequently touched down too far along the runway.	See note 1
2013 (2 Reports)							
2013/07/22	See note 1	See note 1	See note 1	Runway 08 at Chief Dawid Stuurman International Airport	87.45 km ENE	Human error. While conducting a solo circuit training flight, the student experienced a hard landing on Runway 08. Subsequently, the nose wheel collapsed, leading to the propeller making contact with the runway.	Training
2013/05/09	See note 1	See note 1	See note 1	Taxiway A at Chief Dawid Stuurman International Airport	87.45 km ENE	Equipment failure. There was a fire in the No. 2 engine during the taxi after landing.	See note 1
2012 (5 Reports)							
2012/12/19	Boeing 737-244	Jet	>5.7t	Chief Dawid Stuurman International Airport	87.45 km ENE	Equipment failure. On landing on runway 08, the aircraft brakes locked up, causing all four main tyres to blow out, followed by the eruption of wheel fires on the left and right main landing gear of the aircraft. The anti-skid and brake system malfunctioned.	Commercial
2012/05/04	See note 1	See note 1	See note 1	Chief Dawid Stuurman International Airport	87.45 km ENE	Equipment failure. The nose gear malfunctioned, leading to its failure to extend during the landing.	See note 1

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-195

Date	Aircraft			Incident of Accident Location	Distance and Direction from Site ¹⁴	Reason for Accident	Application
	Type	Propeller, Jet or Heli	Mass				
2012/04/17	Beech Baron 58	Prop	<5.7t	±24km northwest of Chief Dawid Stuurman International Airport (S33°56'55.4" E025°20'90.7")	Outside 80 km	Human error. The pilot appeared to have entered instrument meteorological conditions and, in an attempt to remain VFT, he failed to maintain adequate terrain clearance resulting in the aircraft colliding with it.	Private
2012/01/18	Windlass Aquilla microlight	Prop	<5.7t	Near Uitenhage (S33°44'45.75" E025°7'48.23")	62.96 km NE	Human error. Aircraft collided with high tension conductors; the aircraft nose-dived into the terrain.	Private
2012/01/07	Cessna 150	Prop	<5.7t	On Syfergat Farm, ±8 km north of Uitenhage (GPS S33°44.651 E025°19.271)	75.47 km NE	Unknown cause. The aircraft entered a spin at low altitude from which the pilot was unable to recover.	Private
2011 (1 Report)							
2011/05/14	See note 1	See note 1	See note 1	Runway 26 at Uitenhage Airfield	79 15 km NE	Human error. The student pilot reported that during the approach for landing, the aircraft was at a higher altitude than intended and subsequently touched down too far along the runway.	Training
2010 (3 Reports)							
2010/09/15	See note 1	See note 1	See note 1	Uitenhage Airfield	79 15 km NE	Cause unknown. The aircraft encountered an unstable approach, a high descent rate, resulting in a hard landing that led to the tail striking the ground and the wing clipping bushes.	See note 1
2010/05/15	Cessna 152	Prop	<5.7t	Chief Dawid Stuurman International Airport	87.45 km ENE	Human error. Incorrect landing technique used resulting in the aircraft bouncing twice before it landed on the nose gear which subsequently collapsed.	Training
2010/01/07	See note 1	See note 1	See note 1	Chief Dawid Stuurman International Airport	87.45 km ENE	Cause unknown. Hard landing due to low RPM	See note 1
2009 (1 Report)							
2009/11/18	Jetstream Aircraft 4100ZS-OMZ	Prop	<5.7t	Chief Dawid Stuurman International Airport	87.45 km ENE	Equipment failure. During the take-off, the aircraft veered left off the runway. Although the captain applied full right rudder and aileron into the wind, he was unable to arrest the veering to the left. The probable cause with poor maintenance procedures.	Commercial
2008 (3 Reports)							
2008/07/27	Piper PA-22 (fixed wing)	Prop	<5.7t	Chief Dawid Stuurman International Airport	87.45 km ENE	Human error. The pilot experienced strong surface wind conditions during landing and the aircraft bounced and landed hard and sustained substantial damage to the landing gear with an associated runway excursion.	Private
2008/04/11	See note 1	See note 1	See note 1	Chief Dawid Stuurman International Airport	87.45 km ENE	Human error. During a practice for forced landing, the aircraft crashed.	Training
2008/04/07	See note 1	See note 1	See note 1	Chief Dawid Stuurman International Airport	87.45 km ENE	Human error. It appears that the student pilot made unexpected control input during a cyclic, resulting in a hard landing.	Training

- NOTES:**
1. In some instances, recorded occurrences lacked published official reports, with factual information gathered solely for statistical purposes. These instances are marked as “N/A” on the spreadhseet received from the Accident and Incident Investigations Division (AIID) on 5th March 2024.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-196

Appendix 5.7.E: Shipping Incidents and Accidents within and near the Site Region (2007 to February 2024) (SAMSA, 2024)

Date of Incident	Location	Investigating Port	Name of Vessel	Brief Description
2007/01/12	At sea, 33'59.07'S & 025'11.91'E	Port Elizabeth	Highland Queen	Leaking sump, causing engine to lose oil into engine room bilge. V/l towed back to port by MF Gandalf.
2007/02/12	Not recorded	Port Elizabeth	Shiraz & MOL Pride	Collision between Shiraz & MOL Pride. Minor damage to both vessels.
2007/03/05	At anchor off Port St Francis	Port Elizabeth	Caylash	VI capsized and sank at anchor approximately 1.5 nmi offshore at Port St Francis during very rough sea conditions. Of the 15 crew, 14 rescued, 13 survived. 1 crew member died after rescued and 1 drowned.
2007/03/13	Port St Francis harbour	Port Elizabeth	Sparticus	Vessel ran aground upon entry at Port St Francis harbour, causing damage to the underwater bow area.
2007/03/21	Not recorded	Port Elizabeth	Orient	Fire on board in engine room which apparently started at the switchboard. No injuries or deaths to personnel.
2007/04/13	Port of Port Elizabeth	Port Elizabeth	Sea-Land Independence	Tanktainer containing Ethyl Acrylate, Stabilized, IMO CL3, UN 1917 leaking at sea. Strong pungent odour present. Tanktainer was stored on deck. Colourless irritant gas and crew complained.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-197

Date of Incident	Location	Investigating Port	Name of Vessel	Brief Description
2007/04/22	1 nmi off Cape Recife Lighthouse	Port Elizabeth	Reel Magie & Trossie	SFV & SV. Reel Magie collided with Trossie, which was drifting at the time, resulting in serious structural damage to Trossie. 2. Crew had to jump overboard to avoid injury. Trossie towed back to port.
2007/04/24	Port of Port Elizabeth	Port Elizabeth	Lars Maersk	Container ship 20ft cntr bound for Durban ex Tilbury containing multi-class hazardous packages was discovered leaking contents upon the discharge of the cntr. Cntr was supposed to be transhipped
2007/06/03	St Francis Harbour	Port Elizabeth	Karin	Whilst departing Port St Francis, the v/l grounded, leaving the v/l beam-on to a 3.5 m swell, which eventually washed the v/l onto the dolosse, causing approximately 4 m ³ of automotive diesel oil to leak into the sea.
2007/07/09	Approx 2 nmi south of Cape Recife	Port Elizabeth	Ace of Hearts	Near Collision (ski-boat): Whilst fishing at anchor in the vicinity of Cape Recife, the v/l nearly got run over by another v/l causing her to flood with water. The Ace of Hearts was unable to pull up her anchor.
2007/08/23	At sea, 34°04.51'S & 026°50.33'E	Port Elizabeth	Douala Tide	The vessel took a list after cargo shifted, steering gear failed, list increased, causing the vessel to capsize and sink. One crewman died shortly after being rescued from the water (Chief Mate), remaining 11 crew safely rescued.
2007/09/17	At sea, 34°57.01'S & 024°24.7'E	Port Elizabeth	Stevia	Whilst hauling her gear, the net got caught in the propellor rendering her immobile and in need of a tow to the nearest port.
2007/10/19	Port of Port Elizabeth	Port Elizabeth	Wildegans	Vessel flooded alongside jetty. Vessel just a hull with no persons, equipment or machinery on board. Hull apparently breached in way of blanked-off stern tube resulting in flooding and eventually sinking.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-198

Date of Incident	Location	Investigating Port	Name of Vessel	Brief Description
2008/03/07	Port of Port Elizabeth	Port Elizabeth	Sandile	Trawler: On approaching the berth, the vessel made contact with the quay causing damage to her bow area. The vessel was under pilotage at the time of incident, and a tugboat was in attendance.
2008/04/16	1 nmi off Seal Point, St. Francis	Port Elizabeth	Bandido	The vessel reportedly capsized after encountering "white water" while rounding Seal Point in the Cape St Francis area. One crew member injured.
2008/05/18	Port of Port Elizabeth	Port Elizabeth	Kunene	Wooden fishing vessel that has been out of service for a few years sank in the harbour, whilst tied up alongside the wharf. The vessel had no fuel, stores or personnel onboard at the time of the incident (dead ship).
2008/06/04	12 miles south of Eerste Rivier	Port Elizabeth	Ichabo	Whilst enroute to Gansbaai vessel began to take on water and is believed to have sunk before sunrise the following day.
2008/11/23	Quay 10, Port Elizabeth harbour	Port Elizabeth	Southern Fighter & Sparticus	During berthing operations, the engine selector cable snapped on the Sparticus, when astern propulsion was engaged, resulting in the vessel being unable to go astern as required to avoid collision.
2008/12/22	West of Oyster Bay. Eastern Cape	Port Elizabeth	Kingfisher	Vessel in very bad seas and heading east for a lee at St Francis Bay is believed to have been swamped. She capsized and sank west of Oyster Bay. Total crew onboard was 19. 5 survivors, 14 deceased of which 9 bodies have not been found.
2009/03/08	Approximately 11 miles of Cape Recife	Port Elizabeth	Monie Marine & Maritime Master	Monie Marine was involved in a collision with Maritime Master, subsequently the Monie Marine sunk the following day.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-199

Date of Incident	Location	Investigating Port	Name of Vessel	Brief Description
2010/06/15	St Francis Harbour	Port Elizabeth	Oresta	The squid fishing vessel was anchored in the lee of Port St Francis Harbour due to bad weather and sea conditions. The engine room commenced filling with sea water through a cracked swimming pool pump suction filter cover
2010/08/14	Tsitsikamma	Port Elizabeth	Santa Ana	The vessel encountered a starter motor failure and had to be towed by the fishing vessel Vulgaris from Tsitsikamma area to Port St Francis.
2010/08/28	St Croix Island	Port Elizabeth	Nikki	The vessel steering mechanism was damaged due to bad weather. As they were heading to port, the big waves were crashing onto the vessel and the vessel became partly submerged and they had to call NSRI for rescue.
2011/01/31	In engine room	Port Elizabeth	Equinox	Crew noticed smoke coming from engine room. Vessel was towed to PE
2011/12/12	PE Fishing Grounds	Port Elizabeth	MFV Santa Maria	The vessel's main freshwater tank has been contaminated with diesel oil, no one know the cause.
2011/12/31	Jeffreys Bay Main Beach	Port Elizabeth	U-E-12142	The owner was on his ski coming out of the surf, he was taking a wide turn in the shallow water, this is done to negotiate a wave. At the time the owner launched his ski and started making way into the waves, a short while later he collided with the owner. The owner was hit on the STBD side of his vessel by the owner's bow. As the result the owner's side of his vessel got damaged as well as hurting his leg and side of his body. No other injuries reported
2012/01/01	Ngqura	Ngqura	Jin Tai	The vessel sank due to the ingress of water into the engine room through the open trucking

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-200

Date of Incident	Location	Investigating Port	Name of Vessel	Brief Description
2012/02/02	Off Noordhoek	Port Elizabeth	Maluti	The fishing vessel Maluti was towed to port after experiencing engine cut outs which was caused by dirty fuel.
24/02/2012	Algoa Bay	Port Elizabeth	Dolce Vita	Vessel had trouble starting, with her sister ship in the area and it being so close to port, it was decided that she would be towed back due to the favourable weather conditions. The vessel was repaired and sailed out to sea again within the hour.
2012/02/29	Algoa Bay	Port Elizabeth	Sea Star (40305)	The skipper of the vessel noticed droplets of water in the main engine sump. Fearing to damage the engine, she was towed back by her sister vessel Sea Gull.
2012/04/07	Durban	Durban	Ambassador Bridge	During heavy gusty wind, headline parted followed by the other securing lines and the ship started to move from pier. Port control informed and tugs arrived to push the vessel along during the operation process the vessel hit the gantry causing damage to both the radar scanner and aft mast.
2012/06/07	18 miles west of PE	Port Elizabeth	Tracy Jane	The skipper attempted to haul up the anchor and experienced problems when his anchor fouled. His attempts to clear the anchor led to the anchor rope being caught on the stern and subsequently capsized the boat. No injuries or deaths.
2012/06/08	Port of Port Elizabeth	Port Elizabeth	Zanette	A fire was reported by security guards at approximately 19:00. As a result of the fire serious damage to wheelhouse in way of the Gallery was caused.
2012/06/19	Swartkops River Mouth	Port Elizabeth	SRE 1753	The fishing boat hit an unidentified semi-submerged object while exiting the river mouth to go to sea. All crew members on board have been recovered, one crew member sustained hypothermia and another one is suspected to be suffering from internal injuries. They were taken to hospital.

 Eskom	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-201

Date of Incident	Location	Investigating Port	Name of Vessel	Brief Description
2012/06/24	Port of Port Elizabeth	Port Elizabeth	Small Boat	Small boat capsized at the Swartkops River Mouth and 4 crew onboard. No injuries or deaths.
2012/07/14	Port of Ngqura	Ngqura	RDO Concord	The ship's mooring lines broke in extreme weather and the ship left the quay. The Master was heading for Algoa Bay but Port Control insisted that the anchor be released. It did not hold. The ship contacted one moored barge and grounded on a sandy portion of the harbour. Tugs and the incoming tide assisted the re-floating.
2012/07/16	Port of Ngqura	Ngqura	Saga Adventure	The ship was on Innocent Passage bound for Singapore. Due to the extremely bad sea conditions, the cargo of baled wood pulp collapsed and the remainder of the cargo began moving as the ship rolled. The master requested a port of refuge in order to re-stow and lash the cargo.
2012/08/22	Slipway Quay	Port Elizabeth	Dermar	Whilst launching the vessel with a 200T crane, she was dropped due to one of the crane rigging sinking into the quay surface. She was taken out for routine dry-docking reasons. Vessel sustained damaged due to the impact on the quay and was taking in water.
2012/09/26	Port of Port Elizabeth	Port Elizabeth	Ibhayi	The tug suffered engine failure. No major damage or pollution occurred.
2012/10/12	PE Fishing Grounds	Port Elizabeth	MFV Palinurus	Chief Engineer heard noise from engine, assumed it was caused by faulty injectors and replaced them however the noise was still there. Vessel was towed to the Port of Port Elizabeth.
2013/02/03	Assvogels Point	Port Elizabeth	MFV Dheneb	The skipper of the vessel wanted to change his position in the fishing grounds when he realized the hydraulic pipe on his steering gear had corroded through and was leaking oil.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-202

Date of Incident	Location	Investigating Port	Name of Vessel	Brief Description
2013/02/22	10 nmi northeast of Bird Island	Port Elizabeth	Kyena II	The yacht requested assistance as the main engine was out of service.
2013/03/01	Ngqura	Ngqura	MSC Luciana	The ships mooring lines broke due to excessively strong SW winds. She was blown across the port to the finger quay and contacted the Pilot vessel Orient alongside C100. The superstructure was completely destroyed.
2013/03/01	Ngqura	Ngqura	Orca	Tug was assisting MSC Luciana which had parted mooring lines & being blown off quay D100. Tug Orca was pushing on the starboard side of the MSC vessel, trying to hold her alongside. However, because of the strong winds and GT of the vessel, the tug could not hold her alongside. The Orca was wedged between the quay & MSC.
2013/03/01	Ngqura	Ngqura	Orient	Vessel was berthed at C100 along the Finger Quay. She was unmanned at the time. The container vessel Luciana moving towards the Orient, crushed the superstructure against the quay. The stern flare protected the hull.
2013/09/25	Port of Port Elizabeth	Port Elizabeth	Zolani	As the vessel Zolani entered the Port of Port Elizabeth. She ran into the west breakwater. She has sustained a gash of around 3 m × 2 m on the Port Bow. A minor puncture occurred on the STBD bow of around 700 × 700 mm. She pulled herself off the breakwater and moored at the company jetty for repairs.
2013/11/21	Fishing Grounds off St Francis	Port Elizabeth	Marretje	Whilst hauling the nets the trawl got caught in the propeller. No crewman was injured. A diver met the vessel and cut out the nets.
2013/12/08	At sea	Port Elizabeth	Sea Horse (DTP 909B)	The vessel was steaming towards Noordhoek and suddenly lost speed. The propeller shaft had broken off, vessel had to be towed back to PE.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-203

Date of Incident	Location	Investigating Port	Name of Vessel	Brief Description
2013/12/22	Jeffreys Bay	Port Elizabeth	EP 667 C	The rubber duck had lost power to her engines.
2013/12/22	Jeffreys Bay	Port Elizabeth	Miracle	The rubber duck had lost power to her engines.
2014/01/30	At Sea	Port Elizabeth	MFV Sea Horse	The vessels gearbox malfunctioned and had to be towed back to port.
2014/02/18	Port of Port Elizabeth	Port Elizabeth	Zanette	The Zanette was moored alongside the Zuiderzee in Port Elizabeth harbour, at around 03:51 the Zuidersee caught alight. Tn the ensuing fire the heat generated caused external damage to the Zanette. She was shifted away from the Zuidersee before she caught fire.
2014/02/18	Port of Port Elizabeth	Port Elizabeth	Zuidersee	The security guard noticed smoke from the galley extractor fan on board on the vessel. The fire was brought under control by the Metro fire Team. The accommodation, Galley and bridge were destroyed by the fire
2014/04/14	Port of Ngqura	Ngqura	Mare Caribicum	During cargo operations, a relatively strong pungent chemical odour was smelt and began to affect the stevedores and TPT workers. These vapours were coming from Bay 10. It was later discovered that a product, Ethyl Acrylate, UN Class 3 and numbered 1917 was stored in the lower hold. There was a leaking 210 litre drum in one container.
2014/04/26	65 nmi south of Cape Seal	Port Elizabeth	Mfv Starfish - ZR7936	MRCC Cape Town was alerted of the fishing vessel that was battling with water ingress in the main engine room. All crew had been successfully rescued and the vessel sank 65 nmi south of Cape Seal.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-204

Date of Incident	Location	Investigating Port	Name of Vessel	Brief Description
2014/09/02	SE of Bird Island	Ngqura	DR Fridtjof Nansen	Vessel had to be towed to Ngqura due to a supply pipe feeding a square rod for supply to the timing gear bearing had broken.
2014/09/10	Port of Port Elizabeth	Port Elizabeth	Mfv Marretje	The vessel was on her way to the Ice plant, when it got stuck in the mud near a sausage fender in front of the yacht club.
2014/09/14	East of Port St Francis	Port Elizabeth	Mfv Altair & Mfv Southern Star	The Altair had lost electrical power due to generator failure and was heaving up her anchor by hand to return to port. The Southern Star collided with the port side of the Altair putting a large gash in the fish hold.
2014/11/15	At Sea	Ngqura	Seroja Lima	Due to both wind speed and swell action, the ship began to roll considerably, and this caused 26 of the 40 ft container to fall overboard.
2014/11/28	At Sea	Port Elizabeth	Synchro	The vessel left PE to deliver stores and crew to the Mt Smyrni. The ship's cargo hook alleged hooked on the wheelhouse and ripped it from the vessel. No injuries. Vessel had to be towed back to PE Harbour.
2014/12/02	Inland protected waters	Port Elizabeth	XTREME 5	Mr AGA powered down on the motors almost to neutral as he approached the marker. he realised he was not going slower as anticipated and steering had become very difficult. The vessel collided with the western bank of the North End Lake, the vessel subsequently ploughed up and over the lake shore into the safety railings which got damaged in the collision.
2014/12/20	SSE of Seal Point	Ngqura	Harvest Lindiwe	Whilst trawling, a noise was heard, and the ships power supply failed. The ship was towed to the Port of Ngqura.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-205

Date of Incident	Location	Investigating Port	Name of Vessel	Brief Description
2015/02/16	Lat.3413.51'S Long.024 48.01'E	Port Elizabeth	Sea Gull	On 16 February 2015 the squid fishing vessel SeaGull was steaming and the skipper Mr C Isaacs heard a funny noise coming from main engine. Allegedly brought the revs back and the main engine cut out. Attempts to restart the main engine all efforts failed. Skipper informed the company, and the vessel was towed back to Port Elizabeth by FV Sea Lion and arrived safely at 15H45 in PE.
2015/06/03	2 nmi south of Port of Port Elizabeth	Port Elizabeth	MFV COOMBAVA	Around 20:30 on 3 June 2015 the skipper on the Motor Fishing vessel Coombava realised that his main engine had a broken fan belt. On further investigation he found that it was caused by a defective belt tensioner pulley.
2015/08/14	19 nmi southeast of Great Fish Point Lighthouse and 11 nmi from shore.	Port Elizabeth	PENTAGON 5000	Tug INDUS (IMO 7515377) towed the oilrig PENTAGON-5000 from port of Ngqura to Port of Louis Mauritius on 11 August 2015 and experienced apparent technical difficulties en-route; this caused the towing wire to part on 14 August 2015 in the vicinity east of Great Fish Point Lighthouse.
2015/09/28	1.2 nmi East of Port Alfred	Port Elizabeth	RAMBLER	The RAMBLER was en-route from Madagascar to Cape Town when she experienced apparent technical difficulties in the vicinity east of Kenton-On-Sea; this caused her engines to fail, and she drifted northwards.
2015/11/26	34°01.15S 025°43.34E 2NM off Cape Recife	Port Elizabeth	BARATZ	On 26 November 2015 MFV BARATZ sailed from PE Harbour to the fishing grounds. By 12h30 the bilge alarm was activated. The vessel was taking on water in the engine room. All attempts to pump out the water were unsuccessful. The vessel sank at 17h00.
2015/12/06	33°55.4S 025°50.4E	Port Elizabeth	MFV EBHAYI	2hours after leaving Port Elizabeth for fishing grounds she was around 10 nmi from the port the Motor Fishing Vessel EBHAYI experienced steering failure. Several attempts were made to repair the problem at sea, but they were unsuccessful.
2015/12/28	Seaward Sunday River	Port Elizabeth	DODEKA	Skipper tried to start the main engine and it did not want to start. A tow was arranged, and the vessel was towed safely to Port Elizabeth.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-206

Date of Incident	Location	Investigating Port	Name of Vessel	Brief Description
2015/12/30	Algoa Bay	Port Elizabeth	SPARODON	On the 30 December 2015 while fishing in Algoa bay the main engine on board the MFV SPARDON would not start due a defective starter motor. She was taken in tow by the MFV MEGALODON and towed to Cape St Francis where repairs were conducted, and she proceeded back to sea.
2016/01/01	1.5 nmi off Port Alfred	Port Elizabeth	LOUISE MARI	Approximately 16:00 on 1 January 2016 the main engine of the MFV Louise Mari would not start Skipper informed owner and remained at anchor until 17:30.
2016/01/24	Port of Port Elizabeth	Port Elizabeth	MARIGOLD	MFV MARIGOLD was about to sail from the Ice Plant in PE. The mooring ropes were let off and the Skipper started his manoeuvring. TH MFV MARIGOLD momentarily got stuck in the mud at the bottom of the port.
2016/01/29	At Sea 34°11.566'S 024°37.986'E	Port Elizabeth	SOUTHER STAR & PUMULA III	Monday 29 January 2016 the MFV Southern Star collided with Mfv Pumula III the latter being on anchor at approximately 06h10 LT the Pumula III picked up her anchor and returned to port of Port St Francis. Minimal damage was sustained, and she arrived safely in that harbour.
2016/02/10	In Algoa Bay	Port Elizabeth	RM Power and Silver eagle	The Silver Eagle was laying at anchor position and was hit by the vessel RM Power. Fortunately, it was a glancing blow only causing internal structural damage to the Silver Eagle.
2016/03/05	At sea off Cape Recife	Port Elizabeth	KALAHARI	On Monday 29 February 2016 the Skipper of Kalahari felt a vibrant coming from the vessel's stern tube and cutlass area. It was found that the stuffing box and stern tube was moving around and there was controllable water ingress into the engine room.
2016/03/13	At Sea 34°12'86"S 024°47'17"E	Port Elizabeth	KENDAL & NOMVUYO	MFV Kendall collided with MFV Nomvuyo on Sunday 13th March 2016 at 13h40 in position 34°12'86"S; 024°47'17"E. Both vessels suffered reasonable damage but made their way safely to Port Elizabeth Harbour.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-207

Date of Incident	Location	Investigating Port	Name of Vessel	Brief Description
2016/07/05	Aasvogel Point	Port Elizabeth	ALTAIR	The MFV Atlair suffered engine failure while fishing for squid off Aasvogles Point west of Cape St Francis. She was towed back by the fishing vessel The Don to Port St Francis where the engine was repaired.
2016/08/12	Anchorage No. 2	Port Elizabeth	Sea Express	Due to heavy swell, the stern of the Sea Express made contact with another vessel
2016/11/29	Port of Ngqura	Ngqura	Lizi Buko	While assisting the TNPA pilot docking a vessel, the tug came very close to the number 4 channel buoy. The tow rope touched the buoy and caused it to heel over until it touched the gunwale of the tug. No damage was caused.
2016/12/02	PE Fishing Grounds	Port Elizabeth	Dermar	Main engine failed due to the hole in the cooling system.
2016/12/03	Algoa Bay	Port Elizabeth	IN FOR FUN	On Saturday 3 December, the Ski Boat IN FOR FUN capsized in Algoa Bay after dropping anchor to fish with fishing rods. The Skipper reported that the ski boat swung around and she was stern to. He investigated and found that the anchor rope was caught up in the vessel's propeller. Attempting to cut the rope then without warning the vessel capsized. All 4 people on board was rescued by FV Squidder that was passing by. The vessel was towed back to port righted and was taken to the owner's residence.
2017/01/31	At Sea	Port Elizabeth	Lazarus	The vessel suffered engine failure and was towed to PE Harbour,
2017/02/12	20 nmi south of Cape St Francis	Ngqura	APL Austria	Fire onboard.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-208

Date of Incident	Location	Investigating Port	Name of Vessel	Brief Description
2017/08/31	Port of Port Elizabeth	Port Elizabeth	MT Breede & Qunu	The tug Qunu holed the MT Breede on her starboard side whilst assisting with berthing the vessel.
2017/11/05	Port Elizabeth	Port Elizabeth	Lion Heart	A casualty report was submitted stating that the skipper endangered the vessel and passengers on a trip off shark Point. More info was requested however non was forthcoming.
2017/12/19	Port Of Ngqura	Ngqura	Shasa	Whilst coming close the MV Pantanal to make her line fast to be able to assist the pilot with the docking of the Mv Pantanal the tug landed hard on the port side of the vessel between ballast tanks 115 and 117. A jolt was felt on both vessels.
2020/08/19	Port Elizabeth	Port Elizabeth	CSAV Trancura	Loss of container overboard. Caused damage to ship and equipment.
2020/12/04	Port Elizabeth	Port Elizabeth	Crest 1	Whilst offloading cargo to Star Trader, mother vessels crane came in contact with the crest 1's wheel house causing some minor damages.
2021/06/10	Port Elizabeth	Port Elizabeth	Karin 1	Cargo gear failure whilst trawling.
2021/09/14	Port Elizabeth	Port Elizabeth	Lucky Luke	Fishing vessel (10 m ↔ 24m), collision with multiple ships where vessels collided at anchorage.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-209

Date of Incident	Location	Investigating Port	Name of Vessel	Brief Description
2022/01/31	Port Elizabeth	Port Elizabeth	OMS Dominant	Ship type: Off service vessel. Collision took place with other ship. Vessel landed hard whilst cargo operations.
2022/03/03	Port of Ngqura	Port of Ngqura	Torm Australia	Ship type: Chemical tanker. 2nd Officer slipped while closing the bridge door and fractured his leg. The incident occurred outside of SA waters and the vessels only called in SA via OPL – investigations passed on the Danish Authority. MIID completed.
2022/04/14	Port Elizabeth	Port Elizabeth	Halsted	Ship type: Container ship. Occupational accident, stevedore fell off ladder and broke a leg.
2022/07/27	Port Elizabeth	Port Elizabeth	Gambit/ Cape Maclear	Fishing vessel (10 m ↔ 24m). Collision with other ship where vessel collided with another whilst under tow.
2022/10/26	Port Elizabeth	Port Of Ngqura	SANTA ISABEL	Ship type: container ship. While removing a 2 20ft containers via twinlift the containers fell from the container gantry spreader onto the container below.
2023/05/16	Port Elizabeth	Port Elizabeth	Haai Five	Ship type: small vessel (Pleasure). Vessel capsized and skipper drowned.1 fatality recorded.
2023/09/14	Port Elizabeth	Port of Ngqura	Hercules	Ship type: small vessel (Pontoon). Barge Hercules was commencing with first lift/transfer of goods to the Sterling Tora, when the crane wire and hook caught the barge wheelhouse and lifted the wheelhouse of the barge with the skipper side.

	SITE SAFETY REPORT FOR THYSPUNT	Rev 0c	Section-Page
	NEARBY TRANSPORTATION, INDUSTRIAL AND MILITARY FACILITIES		5.7-210

Date of Incident	Location	Investigating Port	Name of Vessel	Brief Description
2023/09/22	Port Elizabeth	Port Elizabeth	Vemaamony	Ship type: Oil tanker. Vessel ran aground due to loss of anchor and drifting.
2024/01/06	Port Elizabeth	Port Elizabeth	Elke M	Ship type: Fishing vessel. Vessel ran aground near Cape St Francis while steaming, no injuries sustained.
2024/02/12	Port Elizabeth	Port Elizabeth	Launch	Ship type: small vessel. 7 drums of oil were lost overboard.