

Belton Park Trading 127 Operations: Updated Rehabilitation, Decommissioning and Closure Plan - 2024

Report Prepared for

Belton Park Trading 127



Report Number 613020

DMRE Reference Number: NCS 30/5/2/1/2(10101)



Report Prepared by

 **srk** consulting

September 2024

Belton Park Trading 127 Operations Updated Rehabilitation, Decommissioning and Closure Plan - 2024

Belton Park Trading 127

SRK Consulting (South Africa) (Pty) Ltd
265 Oxford Rd
Illovo 2196
Johannesburg
South Africa

e-mail: johannesburg@srk.co.za
website: www.srk.co.za

Tel: +27 (0) 11 441 1111
Fax: +27 (0) 11 880 8086

SRK Project Number 613020

September 2024

Compiled by:

Andrew Caddick
Principal Scientist

Email: acaddick@srk.co.za

Authors:

Andrew Caddick; James Lake

Peer Reviewed by:

James Lake
Partner

Table of Contents

Disclaimer.....	v
List of Abbreviations.....	vi
1 Introduction and Scope of Report.....	1
1.1 Mining Method.....	1
1.2 Mineral Processing.....	2
1.3 Location of Activity	2
1.4 Property Description	2
2 Rehabilitation, Decommissioning and Closure Plan.....	5
2.1 Regulatory Requirements	5
2.2 Purpose of the Report and Plan Objectives.....	8
2.3 Project Team.....	8
2.3.1 Summary of Environmental Assessment Practitioner Past Experience	9
2.4 Existing Activities	9
3 Environmental Context	10
3.1 Marine Environment.....	10
3.1.1 Meteorology.....	10
3.2 Physical Oceanography.....	10
3.2.1 Waves.....	10
3.2.2 Tide.....	11
3.2.3 Topography	11
3.2.4 Coastal and Continental Shelf Geology and Seabed Geomorphology.....	11
3.3 Biological Oceanography	11
3.3.1 Habitat Status.....	12
3.4 Ecology	12
3.4.1 Pelagic Fish Communities.....	12
3.4.2 Cetaceans	13
3.5 Archaeological Sites	13
3.6 Conservation Areas and Marine Protected Areas	13
3.7 Air Quality.....	14
3.8 Noise	14
4 Design Principles	15
4.1 Legal and Governance Framework.....	15
5 Closure Vision and Objectives	21
6 Alternatives	22
6.1 Closure and Post Closure Period.....	22
6.2 Closure Assumptions	22
7 Final Concession Area Use	23

8 Annual Rehabilitation Plan	23
8.1 Annual Rehabilitation Plan Objectives	23
8.2 Review of Previous Rehabilitation Activities	23
8.3 Activities to be Undertaken during Year 1	23
9 Environmental Risk Assessment	24
10 Closure Actions	25
10.1 Associated Infrastructure and Equipment	25
10.2 Remediation of Contaminated Areas	25
10.3 Flora on the Seafloor	25
10.4 Waste Management	25
10.5 Specialist Studies	25
10.6 Monitoring	26
11 Threats, Opportunities, and Uncertainties	27
12 Final Rehabilitation, Decommissioning, and Closure Schedule of Actions	28
12.1 Closure Schedule	28
12.2 Organisational Capacity and Capacity Building	28
13 Identified Gaps in the Plan	28
14 Closure Criteria	28
15 Closure Cost Estimate	29
15.1 Estimate of Liability	29
15.2 Monitoring, Auditing, and Reporting	29
15.3 Monitoring, auditing, and reporting to on future revisions	29
15.4 Monitoring, auditing, and reporting to track relinquishment progress	30
16 Conclusions	31
17 References	32

List of Tables

Table 1-1: Co-ordinates of the boundary points of Sea Concession 2C and 3C.	3
Table 2-1: Specific requirements in terms of Appendix 4 of GNR 1147.	6
Table 2-2: Environmental Assessment Practitioner (EAP) Qualifications.....	9
Table 2-3: Environmental Assessment Practitioner expertise.	9
Table 4-1: Summary of South African legislation and implications for closure.	16
Table 8-1: Annual Liability Costs.....	24
Table 11-1: Threats and opportunities relating to closure.....	27
Table 14-1: Closure criteria.....	28
Table 15-1: Summary of closure liability (Excluding VAT).	29
Table 15-2: Schedule of planned audits.....	30

List of Figures

Figure 1-1: Locality map.....	4
-------------------------------	---

Disclaimer

The opinions expressed in this Report have been based on the information supplied to SRK Consulting (South Africa) (Pty) Ltd (SRK) by Belton Park Trading 127 (BPT127). The opinions in this Report are provided in response to a specific request from BPT127 to do so. SRK has exercised all due care in reviewing the supplied information. Whilst SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Opinions presented in this report apply to the site conditions and features as they existed at the time of SRK's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this Report, about which SRK had no prior knowledge nor had the opportunity to evaluate.

List of Abbreviations

ARP	Annual Rehabilitation Plan
BPT	Belton Park Trading 127
DMR	Department of Mineral Resources
DMS	Dense Media Separation
EA	Environmental Authorisation
MPRDA	Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)
MR	Mining Right
NEMA	National Environmental Management Act (Act No. 107 of 1998)
PCLU	Post Closure Land Use
SANBI	South African National Biodiversity Institute
SRK	SRK Consulting (Pty) Ltd

1 Introduction and Scope of Report

SRK Consulting (Pty) Ltd (SRK) has been appointed by Belton Park Trading 127 (BPT), as independent environmental consultants, to undertake the updated closure assessment for the mining project in offshore Concession Areas 2C and 3C.

BPT is the holder of a Mining Right (MR) and an Environmental Authorisation (EA) applicable to the mining of diamonds in Sea Concessions 2C and 3C, located offshore of the West Coast of South Africa.

On 27 February 2017, the (then) Department of Mineral Resources (DMR) issued an EA for mining in Sea Concession 2C in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA). The MR was granted in terms of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA) on 19 December 2017 and executed on 5 January 2018.

On 18 March 2019 the DMR issued an amended EA for mining in Sea Concession 3C and additional/expanded mining target areas in Sea Concession 2C. The amended MR was granted on 27 November 2019 and executed on 18 March 2020. Mining operations commenced on 8 August 2018.

To mine for diamonds, BPT use both invasive and non-invasive methods. The non-invasive method will be made up of desktop studies, geophysical surveys, 3D geological modelling and resource estimation. The invasive methods will comprise of seabed extraction techniques using a seabed crawler.

Geophysical surveys will be done to identify geological features where further exploration sampling will be undertaken. The equipment for the survey will be deployed from a vessel appropriate for the depth and survey method to be used.

Where geological features of interest (showing potential for diamond mining) have been identified, follow up surveys and sampling will be undertaken. Sampling will consist of two methods of which, the first will be extraction of unconsolidated sediment from the seabed using drill technology from a dedicated exploration vessel and the second method will be extraction of unconsolidated sediment using a dedicated bulk sampling vessel to dredge exploration trenches using crawler technology. The sampled material will be treated on board the vessels through a diamond processing plant inclusive of the final concession diamond processing plant.

1.1 Mining Method

The proposed mining operations would be undertaken by the seabed crawler, deployed off the mining vessel, the MV Ya Toivo. The vessel is a self-contained mining unit that can operate continuously for eleven months of the year. However, practical restrictions imposed by operating at sea limit the mining operations to approximately eight months of the year (SLR, 2018).

The vessel is equipped with a track-mounted subsea crawler capable of working to depths up to 200 m below sea level. The crawler, which is fitted with highly accurate acoustic seabed navigation and imaging systems, and equipped with an anterior suction system, is lowered to the seabed and is controlled remotely from the surface support vessel through power and signal umbilical cables. Water jets in the crawler's suction nozzle loosen seabed sediments, and sorting bars filter out oversize boulders. The mined sediments are pumped to the surface for shipboard processing (SLR, 2018).

BPT contracted International Mining and Dredging South Africa (Pty) Ltd to mine, utilising the Maritime Vessel (MV) Ya Toivo and a seabed crawler. Once the mining vessel has been anchored over the planned (300 m x 300 m) "mining spread", the seabed crawler is lowered to the seafloor and remotely controlled from the mining vessel through a power and signal umbilical cord. The seabed crawler can move within a radius of 60 – 100 m of the vessel.

1.2 Mineral Processing

Once the sediment has been removed from the seabed it is pumped to the surface for primary screening to remove the oversize and undersize fractions. These fractions are immediately discarded back to the sea via a special tailings moonpool system. It is estimated that about 90% of the sediment that is removed from the seabed falls within the oversize and undersize fractions and would be returned directly to the sea. The remaining fraction of interest (plantfeed) undergoes processing by means of Dense Media Separation (DMS) (SLR, 2018).

Tailings are returned directly to the sea via the moon pool system. The moon pool system comprises four separate openings from the hull to the water below. Tailings are redeposited to approximately the same location from which they were extracted, and deposition to unmined areas is avoided as far as possible.

Deposition of tailings partially backfills the mined areas, leaving localised depressions where sediment is deposited unevenly, which over time fill with sediment from natural deposition and currents.

As there are no formal backfilling and rehabilitation measures, detailed benthic surveys were required prior to commencement of mining, as well as during and after mining activities, to assess rehabilitation.

1.3 Location of Activity

BPT undertake mining operations in various target areas within the Sea Concession 2C and 3C. The concession area is situated approximately 500 km north of Cape Town, with the inshore boundary 5 km seaward of the coast between Port Nolloth in the south and Alexander Bay in the north.

The location of the infrastructure will be determined based on the location of the mining activities within offshore concession 2C and 3C. All infrastructure will be temporary and/or mobile. Location of the Concession Areas are presented in Figure 1-1.

1.4 Property Description

The project is located in Sea Concession Areas 2C and 3C (Figure 1-1), which are offshore areas located approximately 500 km north of Cape Town of South Africa. BPT is authorised in terms of the EA and the MR to undertake mining activities in four target areas across Sea Concessions 2C and 3C. The total mining footprint (area of the four target areas) is approximately 3 020 ha (~30 km²), 0.65% of the total 4 613.5 km² extent of Sea Concessions 2C and 3C (SLR, 2018).

The study area is located in the central subregion of the Benguela region¹ dominated by the cold Benguela Current, but also influenced by intrusions of warm-water eddies of the Agulhas Current.

The terrestrial climate along the West Coast of South Africa is considered moderate. Weather patterns along the West Coast are influenced largely by the mid-latitude subtropical cyclones that are generated to the southwest of the country, and the South Atlantic and Indian Ocean high pressure systems (Schuman *et al.*, 1995).

¹ The Benguela region extends the length of the Benguela Current from approximately Cape Point in the South, to the position of the Angola-Benguela front in the North. The Benguela Region can be divided into three subregions, namely the Southern Benguela (Cape Point to Cape Columbine), Central Benguela (Cape Columbine to Lüderitz) and Northern Benguela (Lüderitz to the Angola-Benguela front).

Table 1-1: Co-ordinates of the boundary points of Sea Concession 2C and 3C.

Sea Concessions 2C and 3C (Coordinates of the boundary):	Point	Latitude	Longitude
	1	28.87487640 S	16.23853408 E
	2	28.87445777 S	16.56083128 E
	3	29.09142027 S	16.71991922 E
	4	29.35606673	16.88897418 E
	5	29.35613898 S	15.45952265 E
	6	28.09141959 S	16.87794953 E
Application area (Ha)	The total mining footprint (area of the four target areas) is approximately 3 020 ha (~30 km ²), 0.65% of the total 4 613.5 km ² extent of Sea Concessions 2C and 3C		
Magisterial district:	Not Applicable		
Distance and direction from nearest town	The project is located in offshore areas approximately from 500 km West of Cape Town South Africa.		
21-digit Surveyor General Code for each farm portion	Not Applicable. The BPT Concession mining project is located offshore.		

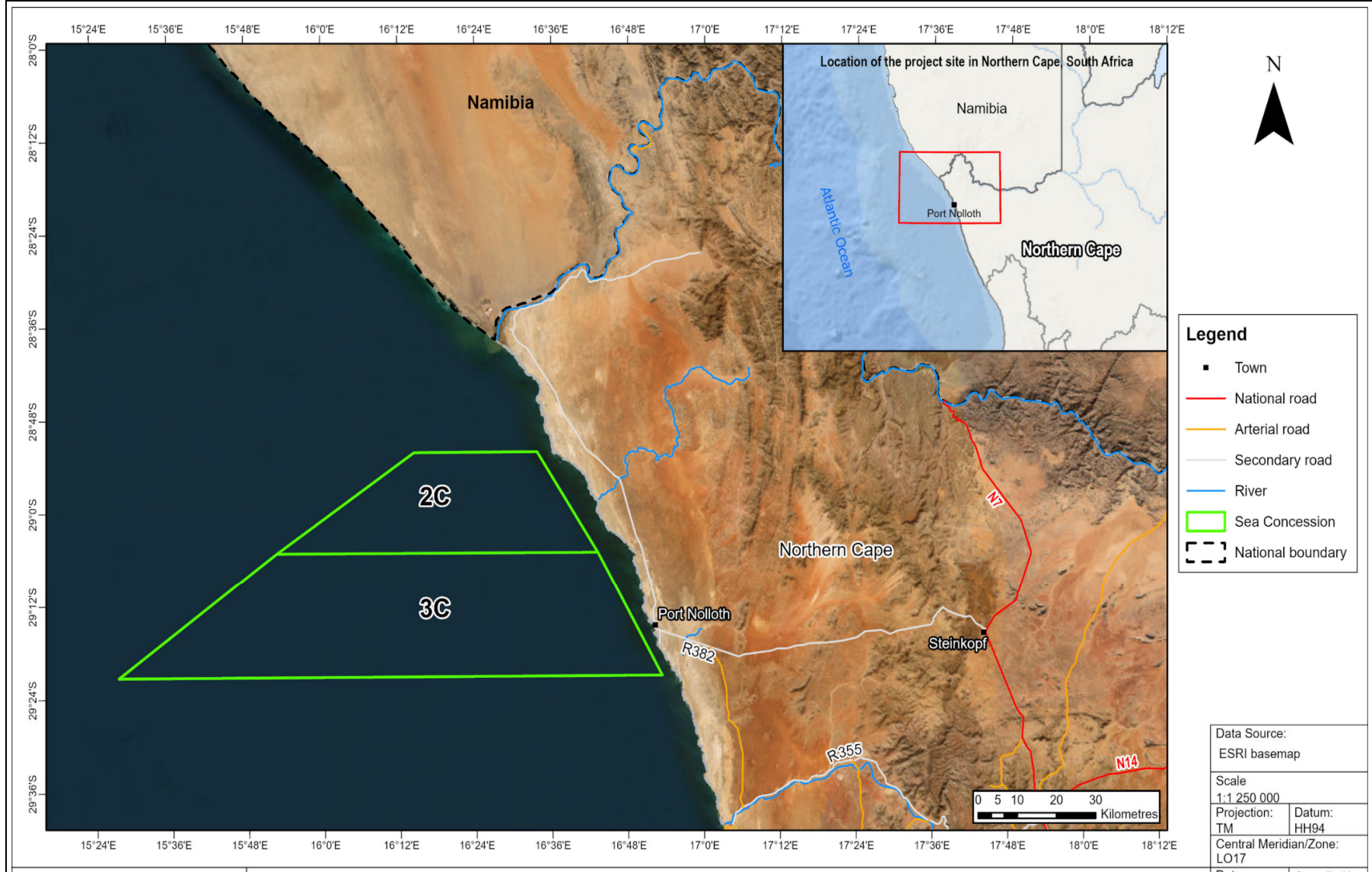


Figure 1-1: Locality map.

2 Rehabilitation, Decommissioning and Closure Plan

2.1 Regulatory Requirements

Prior to November 2015, the determination of the expected closure liability and the provisioning of funds for closure was regulated by the Mineral and Petroleum Resources Development Act, 28 of 2004 (MPRDA). On 20 November 2015, regulations under the NEMA, Financial Provisioning Regulations, 2015 GNR1147 (GNR1147) were promulgated and replaced certain sections of the MPRDA. The intent of the GNR1147 was to require mining operations to adopt a strategic approach to closure planning and financial provisioning. The intention is to require operations to undertake focussed closure planning and then actively implement rehabilitation measures during operations, to reduce the liability at the end of the life of the prospecting activities. When GNR1147 was promulgated, compliance with GNR1147 was required by February 2017. However, as there are several technical issues with the regulations, various proposed amendments to the regulations have been published for comment, although no substantial amendments have yet been promulgated. Because of the technical issues related to GNR1147, an indefinite extension of the Transitional Arrangements is in effect. Although various amendments have been published for comment, there is no definition as to the final version of the regulations and how they will differ from GNR1147.

Although compliance to GNR1147 is not required for operations which have existing authorisations, mining companies are still required to make provision for the liability and assess the quantum of the liability under Regulations 53 and 54 of Regulation 527 under the MPRDA.

While there have been changes to the regulations with the drafts promulgated, the requirements of the three plans (Annual Rehabilitation Plan, Final Rehabilitation, Decommissioning Plan and Mine Closure Plan) and Environmental Risk Assessment Report considered under the legislation has remained consistent. This document has been prepared to comply with the requirements of Appendix 3 (Annual Rehabilitation Plan), 4 (Rehabilitation, Decommissioning and Closure Plan) and 5 (Environmental Risk Assessment Report) of GNR1147.

Table 2-1 below indicates the sections in which the specific requirements of the legislation are addressed in this document.

Table 2-1: Specific requirements in terms of Appendix 4 of GNR 1147.

Regulation	Description of Regulation	Section	Page
GNR 1147 Appendix 3 – Annual Rehabilitation Plan			
(3)(a)	Details of the person or persons that prepared the plan, and timeframes of implementation of the current, and review of the previous rehabilitation activities.	Section 2.3	Page 8
(3)(b)	The pertinent environmental and project context relating directly to the planned annual rehabilitation and remediation activity	Section 3	Page 10
(3)(c)	Results of monitoring of risks identified in the final rehabilitation, decommissioning and mine closure plan with a view to informing rehabilitation and remediation activities.	To be confirmed after the first implementation of the Annual Rehabilitation Plan.	
(3)(d)	An identification of shortcomings experienced in the preceding 12 months.	To be confirmed after the first implementation of the Annual Rehabilitation Plan.	
(3)(e)	Details of the planned annual rehabilitation and remediation activities or measures for the forthcoming 12 months.	Section 8	Page 23
(3)(f)	A review of the previous year's annual rehabilitation and remediation activities.	To be confirmed after the first implementation of the Annual Rehabilitation Plan.	
(3)(g)	Costing.	Section 8	Page 23
GNR 1147 Appendix 4 - Final Rehabilitation, Decommissioning and Mine Closure Plan			
3(a)	Details of the person or persons that prepared the plan.	Section 2.3	Page 8
3(b)	The context of the project, including material information and issues that have guided the development of the plan, an overview of the environmental context, the social context regarding closure activities and post-mining land use, stakeholder issues and comments, and the mine plan and schedule for operations.	Section 3, 0,0	Page 10, 15, 23
3(c)	Findings of an environmental risk assessment leading to the most appropriate closure strategy.	Section 9	Page 24
3(d)	Design principles, including the legal and governance framework the closure vision, objectives and targets, alternative closure and post closure options, a motivation for the preferred closure action, details of the closure and post closure period, details associated with any on-going research on closure options, and details of assumptions made to develop closure actions.	Section 0	Page 15
3(e)	A proposed final post-mining land use.	Section 0	Page 23
3(f)	Closure actions required.	Section 10	Page 25

Regulation	Description of Regulation	Section	Page
3(g)	A schedule of actions for final rehabilitation, decommissioning and closure.	Section 12	Page 28
3(h)	An indication of the organisational capacity that will be put in place to implement the plan, including the organisational structure.	Section 12.2	Page 28
3(i)	An indication of gaps in the plan.	Section 13	Page 28
3(j)	Relinquishment criteria for each activity or infrastructure in relation to environmental aspects with auditable indicators.	Section 14	Page 28
3(k)	The closure cost estimation procedure.	Section 15	Page 36
3(l)	Monitoring, auditing and reporting requirements which relate to the risk assessment, legal requirements and knowledge gaps.	Section 15.2	Page 29
3(m)	Motivations for any amendments made to the final rehabilitation, decommissioning and mine closure plan, given the monitoring results in the previous auditing period and the identification of gaps as per 2(i).	Not Applicable	Not Applicable
GNR 1147 – Appendix 5 - Environmental Risk Assessment			
3(a)	Details of the person or persons that prepared the plan.	Section 2.3	Page 8
3(b)	Details of the assessment process used to identify and quantify the latent risks.	Section 9	Page 24
3(c)	Management Activities.	Section 10	Page 25
3(d)	Costing.	Section 9	Page 31
3(e)	Monitoring, auditing and reporting requirements.	Section 15.2	Page 29

2.2 Purpose of the Report and Plan Objectives

The purpose of this Report is to provide a plan that is measurable and auditable to BPT that takes into consideration the proposed post-operation end use of the affected areas. The document contains information that is necessary for the definition of the closure vision, objectives, and design and relinquishment criteria and indicates what infrastructure and activities will ultimately be decommissioned, closed, removed and remediated. Furthermore, the document identifies the risk drivers determining actions, indicating how the closure actions will be implemented to achieve closure relinquishment criteria. Finally, the expected monitoring, auditing, and reporting requirements are documented.

The objectives of the final rehabilitation, decommissioning and closure plan, as they are stated in Appendix 4 of the regulations, are to identify a post closure Concession Area use that is feasible through the following:

- Providing the vision, objectives, targets, and criteria for final rehabilitation, decommissioning and closure of the project;
- Outlining the design principles for closure;
- Explaining the risk assessment approach and outcomes and link closure activities to risk rehabilitation;
- Detailing the closure actions that clearly indicate the measures that will be taken to mitigate and/or manage identified risks and describes the nature of residual risks that will need to be monitored and managed post closure;
- Committing to a schedule, budget, roles, and responsibilities for final rehabilitation, decommissioning and closure of each relevant activity or item of infrastructure;
- Identifying knowledge gaps and how these will be addressed and filled;
- Detailing the full closure costs for the life of project at increasing levels of accuracy as the project develops and approaches closure in line with the final land use proposed; and
- Outlining monitoring, auditing, and reporting requirements.

According to the GNR1147 Regulations, financial provision must be made for rehabilitation and remediation; decommissioning and closure activities for the end of prospecting, exploration, mining, or production operations; and remediation and management of latent or residual environmental impacts which may become known in the future.

In order to address these requirements, this document includes an annual rehabilitation plan, a final rehabilitation, decommissioning and closure plan, and an environmental risk assessment report.

2.3 Project Team

This plan was developed by Mr Andrew Caddick (Pr Sci Nat/ 400021/16 with SACNASP), a Principal Scientist at SRK with 15 years' experience in Environmental Management. The plan was reviewed by Mr. James Lake, who has more than 25 years' experience in the environmental field.

The qualifications of the project team are provided for in Table 2-2 below.

Table 2-2: Environmental Assessment Practitioner (EAP) Qualifications

EAP Name	Qualifications	Professional registration	Years' Experience
James Lake	MSc Environmental Geochemistry	Pr Sci Nat (400044/04)	25
Andrew Caddick	MSc Environmental Management and Development	Pr Sci Nat (400021/16)	15

2.3.1 Summary of Environmental Assessment Practitioner Past Experience

The project team' expertise is provided for in Table 2-3 below.

Table 2-3: Environmental Assessment Practitioner expertise.

Name of EAP	Experience
James Lake	<p>James Lake is a registered Professional Natural Scientist (SACNASP Reg Number 400045/14) with a Master degree in Environmental Geochemistry. James Lake has been involved in the field of environmental science for over 25 years, having worked largely in the mining sector in Africa (including South Africa, Zimbabwe, Zambia, Ethiopia, the Democratic Republic of Congo, and Mauritania) across a broad range of resources. He has wide experience in the geochemical assessments of mine residues and industrial waste characterisation. This has included long term impact predictions for both Greenfields and brownfields sites. James is able to link his understanding of geochemistry and the processes that affect drainage from mine residue facilities in assisting mines in identifying appropriate water management strategies to limit potential impacts on water quality.</p> <p>Over the last 14 years James has developed an interest in closure planning and has assisted numerous operations in South Africa and internationally with the development of closure liability assessments and mine closure plans. James couples his wide technical understanding of mining along with his geochemical background to identify pragmatic solutions for closure.</p> <p>James has been involved in numerous environmental due diligences of mining projects against in-country regulatory requirements and good international industry practice based on the World Bank Equator Principles and IFC Performance Standards for investitures and divestitures. James is also regularly a team member of Pre-Feasibility and Feasibility Studies providing input to or review of the closure sections of these studies.</p>
Andrew Caddick	<p>Andrew Caddick is an experienced and professionally certified EAP with over 15 years of experience. Andrew has an Master's degree in Environmental Management and Development.</p> <p>Andrew's expertise in Environmental management and science extend from environmental impact assessments, environmental management plans, basic assessments, water use license, stakeholder engagement, to environmental compliance auditing, waste management/classification and Geographic Information Systems (GIS) projects. Andrew has also been involved with the compilation of Quantum for Financial Provision, rehabilitation and closure assessments, waste management plans and classifications for the mining environment.</p> <p>Andrew has been involved in numerous environmental due diligences of mining projects against in-country regulatory requirements and good international industry practice based on the World Bank Equator Principles and IFC Performance Standards for investitures and divestitures. Andrew is also regularly a team member of Pre-Feasibility and Feasibility Studies providing input to or review of the closure sections of these studies.</p>

2.4 Existing Activities

The authorised mining operations are carried out as described in the EIA Report (CCA Environmental, 2016) and EA Amendment Report (SLR Consulting, 2018).

The EA was issued for Activity 17 of Listing Notice 2² and authorises BPT to conduct mining operations in Sea Concessions 2C and 3C, offshore of the West Coast of South Africa.

² Government Notice (GN) 983 of 2014

BPT is authorised in terms of the EA and the MR to undertake mining activities in four target areas across Sea Concessions 2C and 3C. The total mining footprint (area of the four target areas) is approximately 3 020 ha (~30 km²), 0.65% of the total 4 613.5 km² extent of Sea Concessions 2C and 3C (SLR Consulting, 2018).

Six mining campaigns in both Sea Concessions 2C and 3C have been undertaken, using *MV Ya Toivo* over the following periods:

- 14 August 2022 to 12 November 2022;
- 14 December 2022 to 31 December 2022;
- 1 January 2023 to 8 March 2023;
- 28 June 2023 to 31 December 2023;
- 1 January 2024 to 11 January 2023; and
- 12 April 2024 to 30 June 2024.

3 Environmental Context

The following section provides an overview of the environmental setting in the area based on available information obtained from literature, spatial datasets, and previous specialist studies. This section is intended to provide preliminary context to the rehabilitation, decommissioning and closure plan, Annual Rehabilitation Plan and Risk Assessment Report, and to assist in the understanding of the key issues that are required to be addressed and is not intended to provide a comprehensive description of environmental conditions.

3.1 Marine Environment

This section provides a general overview of the physical and biological oceanography and human utilisation of South African West Coast and, where applicable, detailed descriptions of the marine environment that may be directly affected by the proposed mining activities (SLR Consulting, 2018).

The study area lies within the southern zone of the Benguela Current region and is characterised by the cool Benguela upwelling system.

3.1.1 Meteorology

Wind and weather patterns along the West Coast are primarily due to the South Atlantic high-pressure cell and the eastward movement of mid-latitude cyclones (which originate within the westerly wind belt between 35° to 45°S), south of the subcontinent.

Strong north-westerly (NW) to south-westerly (SW) winds result from mid-latitude cyclones passing the southern Cape at a frequency of 3 to 6 days. Associated with the approach of mid-latitude cyclones is the appearance of low-pressure cells, which originate from near Lüderitz on the Namibian coast and quickly travel around the subcontinent (SLR Consulting, 2018).

3.2 Physical Oceanography

The following section details the physical oceanography of the mining concessions.

3.2.1 Waves

Most of the West Coast of southern Africa is classified as exposed, experiencing strong wave action, rating between 13-17 on the 20 point exposure scale (McLachlan 1980). Much of the coastline is, therefore, impacted by heavy south-westerly swells generated in the roaring forties, as well as

significant sea waves generated locally by the prevailing southerly winds. The peak wave energy periods fall in the range 9.7 to 15.5 seconds.

The wave regime along the southern African West Coast shows only moderate seasonal variation in direction, with virtually all swells throughout the year coming from the south-west - south direction. Winter swells are strongly dominated by those from the south-west to south-south-west which occur almost 80% of the time, and typically exceed 2 m in height, averaging about 3 m, and often attaining over 5 m. With wind speeds capable of reaching 100 km/h during heavy winter south-westerly storms, winter swell heights can exceed 10 m (SLR Consulting, 2018).

3.2.2 Tide

Tides along the West Coast are subject to a simple semi-diurnal tidal regime with a mean tidal range along the Namaqualand coast of about 1.57 m (at least 50% of the time in the nearshore area), with spring tides as much as 2.24 m and neap tides in the order of 1 m. Tides arrive almost simultaneously (within 5 to 10 minutes) along the whole of the West Coast. Other than in the presence of constrictive topography, e.g. an entrance to enclosed bay or estuary, tidal currents are weak (SLR Consulting, 2018).

3.2.3 Topography

The continental shelf along the West Coast is generally wide and deep, although large variations in both depth and width occur. The shelf maintains a general north-north-west trend, widening north of Cape Columbine and reaching its widest off the Orange River (180 km). Between Cape Columbine and the Orange River, there is usually a double shelf break, with the distinct inner and outer slopes, separated by a gently sloping ledge, the middle shelf. The immediate nearshore area consists mainly of a narrow (about 8 km wide) rugged rocky zone, sloping steeply seawards to a depth of around 80 m. The middle and outer shelf typically lacks relief, sloping gently seawards before reaching the shelf break at a depth of approximately 300 m (SLR Consulting, 2018).

3.2.4 Coastal and Continental Shelf Geology and Seabed Geomorphology

The continental shelf along the West Coast is generally wide and deep, although large variations in both depth and width occur. The shelf maintains a general north-north-west trend, widening north of Cape Columbine and reaching its widest off the Orange River (180 km). Between Cape Columbine and the Orange River, there is usually a double shelf break, with the distinct inner and outer slopes, separated by a gently sloping ledge, the middle shelf. The immediate nearshore area consists mainly of a narrow (about 8 km wide) rugged rocky zone, sloping steeply seawards to a depth of around 80 m. The middle and outer shelf typically lacks relief, sloping gently seawards before reaching the shelf break at a depth of approximately 300 m.

3.3 Biological Oceanography

Biogeographically, Sea Concessions 2C and 3C fall into the cold temperate Namaqua Bioregion, which extends from Sylvia Hill, north of Lüderitz in Namibia southwards to Cape Columbine (Emanuel et al. 1992; Lombard et al. 2004). The coastal, wind-induced upwelling characterising the Western Cape coastline, is the principle physical process which shapes the marine ecology of the southern Benguela region. The Benguela system is characterised by the presence of cold surface water, high biological productivity, and highly variable physical, chemical and biological conditions. The West Coast is, however, characterised by low marine species richness and low endemism (Awad et al. 2002).

Communities within marine habitats are largely ubiquitous throughout the southern African West Coast region, being particular only to substrate type or depth zone. These biological communities consist of

many hundreds of species, often displaying considerable temporal and spatial variability (even at small scales). The majority of the proposed survey area is located beyond the 50 m depth contour. The near- and offshore marine ecosystems comprise a limited range of habitats, namely unconsolidated seabed sediments, deep water reefs and the water column.

3.3.1 Habitat Status

Rocky shore and sandy beach habitats are generally not particularly sensitive to disturbance and natural recovery occurs within 2-5 years. However, much of the Namaqualand coastline has been subjected to decades of disturbance by shore-based diamond mining operations (Penney et al. 2007). These cumulative impacts and the lack of biodiversity protection has resulted in large portions of the coastal habitat types in Namaqualand being assigned a threat status of 'critically endangered' (Lombard et al. 2004; Sink et al. 2012). On the South African National Biodiversity Institute (SANBI) benthic and coastal habitat type GIS database, the threat status of the benthic habitats within Sea Concessions 2C and 3C are mapped as Least Threatened.

3.4 Ecology

The biological productivity that results from the wind driven upwelling is the main characteristic of the ecology of the area. The unique combination of seasonal increases in surface water nutrient levels combined with biological communities that have adapted to take advantage of this phenomenon leads to a particular pelagic and benthic faunal community in the Concession Area comprising low diversity and low endemism. This faunal assemblage represents both sedentary (resident) and transient (migratory) fauna that either utilise the area seasonally or are confined to the area during their life history. The Benguela system displays cold surface water, significant biological productivity, and notable fluctuations in physical, chemical, and biological conditions (Awad et al., 2002).

3.4.1 Pelagic Fish Communities

Organisms that utilise the marine open water column are termed pelagic, and while they may also utilise the benthos, they are predominantly found within the water column. These communities are typically divided into plankton which forms the base of the food web followed by fish, marine mammals (seals, dolphins, and whales), seabirds and marine turtles.

Small pelagic species occurring beyond the surfzone and generally within the 200 m contour include the sardine/pilchard (*Sardinops ocellatus*), anchovy (*Engraulis capensis*), chub mackerel (*Scomber japonicus*), horse mackerel (*Trachurus capensis*) and round herring (*Etrumeus whiteheadi*). These species typically occur in mixed shoals of various sizes, and exhibit similar life history patterns involving seasonal migrations between the West and South coasts.

Two species that migrate along the West Coast following the shoals of anchovy and pilchards are snoek *Thyrsites atun* and chub mackerel *Scomber japonicas*. Their appearance along the West and South-West coasts are highly seasonal. Snoek migrating along the southern African West Coast reach the area between St Helena Bay and the Cape Peninsula between May and August. They spawn in these waters between July and October before moving offshore and commencing their return northward migration (Payne & Crawford 1989). They are voracious predators occurring throughout the water column, feeding on both demersal and pelagic invertebrates and fish. Chub mackerel similarly migrate along the southern African West Coast reaching South-Western Cape waters between April and August. They move inshore in June and July to spawn before starting the return northwards offshore migration later in the year. Their abundance and seasonal migrations are thought to be related to the availability of their shoaling prey species (Payne & Crawford 1989).

Large pelagic species include tunas, billfish and pelagic sharks, which migrate throughout the southern oceans, between surface and deep waters (>300 m) and have a highly seasonal abundance in the

Benguela. Species occurring off western southern Africa include the albacore/longfin tuna *Thunnus alalunga*, yellowfin *T. albacares*, bigeye *T. obesus*, and skipjack *Katsuwonus pelamis* tunas, as well as the Atlantic blue marlin *Makaira nigricans*, the white marlin *Tetrapturus albidus* and the broadbill swordfish *Xiphias gladius* (Payne & Crawford 1989). The distribution of these species is dependent on food availability in the mixed boundary layer between the Benguela and warm central Atlantic waters. Concentrations of large pelagic species are also known to occur associated with underwater feature such as canyons and seamounts as well as meteorologically induced oceanic fronts (Penney et al. 1992).

3.4.2 Cetaceans

Thirty-four species of whales and dolphins are known (based on historic sightings or strandings records) or likely (based on habitat projections of known species parameters) to occur in these waters. The offshore areas have been particularly poorly studied with almost all available information from deeper waters (>200 m) arising from historic whaling records prior to 1970. Current information on the distribution, population sizes and trends of most cetacean species occurring on the West Coast of southern Africa is lacking. Information on smaller cetaceans in deeper waters is particularly poor and the precautionary principle must be used when considering possible encounters with cetaceans in this area.

Records from stranded specimens show that the area between St Helena Bay (~32° S, 18° E) and Cape Agulhas (~34° S, 20° E) is an area of transition between Atlantic and Indian Ocean species, as well as those more commonly associated with colder waters of the West Coast (e.g. dusky dolphins and long finned pilot whales) and those of the warmer east coast (e.g. striped and Risso's dolphins) (Findlay et al. 1992). Sea Concessions 2C and 3C lie north of this transition zone and can be considered to be truly on the 'west coast'. However, the warmer waters that occur offshore of the Benguela ecosystem (more than approximately 100 km offshore) provide an entirely different habitat, that despite the relatively high latitude may host some species associated with the more tropical and temperate parts of the Atlantic such as rough toothed dolphins, Pan-tropical spotted dolphins and short finned pilot whales.

3.5 Archaeological Sites

As the West Coast contains a wealth of shell middens, cave deposits, historical artefacts, palaeontological sites and shipwrecks close to the shore.

Various sites comprising fossilised forests have been found during previous marine diamond exploration and/or mining activities with Sea Concessions 2C to 5C. Bamford and Corbett (1994) described various specimens of fossil wood which were recovered from the continental shelf between the mouth of the Orange River and Kleinsee in the vicinity of Sea Concessions 2C and 3C. The wood was collected in water depths of 100 to 150 m during exploration of the shelf by De Beers Marine (Pty) Ltd and the species were found to be predominately *Podocarpaceae* species.

Over 2 000 shipwrecks are present along the South African coastline. The majority of known wrecks along the West Coast are located in relatively shallow water close inshore (within the 100 m isobath). Wrecks older than 60 years are protected under the National Heritage Resources Act (Act No 25 of 1999) (NHRA).

3.6 Conservation Areas and Marine Protected Areas

Numerous conservation areas and a marine protected area (MPA) exist along the West Coast of the South Africa, although none fall within the approved and proposed expanded mining area.

The only conservation area in the vicinity of Sea Concession 2C and 3C in which restrictions apply is the McDougall's Bay rock lobster sanctuary near Port Nolloth, which is closed to commercial exploitation of rock lobsters. Sea Concession 3C and the proposed expanded mining target areas lie offshore and north of the McDougall's Bay rock lobster sanctuary, which extends 1 nm seawards of the high water mark between the promontory at the northern end of McDougall's Bay and the promontory at the southern extremity of McDougall's Bay.

As part of the Operation Phakisa Initiative, 22 new MPAs have been identified and proposed for declaration in terms of the National Environmental Management: Protected Areas Act, 2003 (No. 57 of 2003) (NEM:PAA), as amended. The declaration of these new MPAs aims to create approximately 70 000 km² of MPAs, increasing the protection within the South African EEZ to more than 5%. The potential MPA areas were recently presented to Government and accepted for future declaration as new MPAs. However, no formal declarations have to date been gazetted.

Of principal importance in the general project area is the proposed Namaqua Fossil Forest MPA, which is located approximately 6.5 km to the south of Sea Concession 3C.

3.7 Air Quality

There are no significant sources of air pollution in the area. It is therefore expected that air quality in the project area is good.

3.8 Noise

There are no significant sources of noise in the area, other than vessels.

4 Design Principles

4.1 Legal and Governance Framework

There are a number of legal and regulatory frameworks with which BPT must comply. The following presents what SRK considers the key legislation, which could materially affect rehabilitation and closure:

- Constitution of the Republic of South Africa (Act 108 of 1996) (Constitution);
- National Environmental Management Act (Act 107 of 1998) (NEMA);
- National Environmental Management Amendment Act (Act 62 of 2008) (NEMAA);
- National Environmental Management Act: Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations (GNR 1147) which replaces the Mineral and Petroleum Resources Development Act (Act 68 of 2002) (MPRDA) – closure and financial provision elements repealed;
- EIA Regulations 2014 as amended in 2017;
- MPRDA as it pertains to the Social and Labour Plan (SLP);
- National Environmental Management: Waste Act (59 of 2008) (NEM:WA) and supporting regulations;
- Waste Classification and Management Regulations;
- National Environmental Management: Air Quality Act (Act 39 of 2004) (NEM:AQA);
- National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008) (NEM:ICMA);
- National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEM:BA);
- National Environmental Management: Protected Areas Act (Act 57 of 2003) (NEM:PA);
- Marine Living Resources Act (Act 29 of 1998);
- National Heritage Resources Act (Act 29 of 1999);
- Maritime Zones Act (Act 15 of 1994); and
- Occupational Health and Safety Act, (Act 85 of 1993 as amended) (OSH).

Table 4-1 provides a brief description of the legislation as it pertains to closure.

Table 4-1: Summary of South African legislation and implications for closure.

Legislation	Implications for Closure
<p>The Constitution</p> <p>In terms of Section 24 of the Constitution “Everyone has the right to:</p> <ul style="list-style-type: none"> • An environment that is not harmful to their health or well-being; and • Have the environment protected, for the benefit of present and future generations.” 	<p>Constitutional requirement to ensure that the Plan includes measures that protect the rights of people to an environment that is not harmful to health or well-being post closure.</p>
<p>National Environment Management Act (Act 107 of 1998)</p> <p>Sections 28 (1) and (3) of NEMA set out the duty of care principle, which is applicable to all types of pollution and must be taken into account in considering any aspects of potential environmental degradation.</p> <p>Every person who causes, has caused, or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.</p>	<p>The measures required in terms of subsection (1) may include measures to:</p> <ul style="list-style-type: none"> • Investigate, assess, and evaluate the impact on the environment; • Inform and educate employees about the environmental risks of their work and the manner in which their tasks must be performed to avoid causing significant pollution or degradation of the environment; • Cease, modify, or control any act, activity, or process causing the pollution or degradation; • Contain or prevent the movement of pollutants or the causes of degradation; • Eliminate any source of the pollution or degradation; or • Remedy the effects of the pollution or degradation.
<p>Environmental Impacts Assessment Regulations, 2014 as amended in 2017</p> <p>These regulations were developed for the preparation, evaluation, submission, processing, and consideration of, and decision on, applications for environmental authorisations.</p>	<p>Any new EIAs for BPT will be required to consider closure during planning and to include a closure plan and closure estimate to support an authorisation application.</p>
<p>National Environment Management: Waste Act (Act 59 of 2008)</p> <p>Part 8 of Chapter 4 of the Act indicates the requirement to identify the status and risk of contaminated sites and provides a legal mechanism for remediation activities to be instigated and controlled.</p>	<p>Contamination resulting from operational activities will require immediate remediation, with the final seabed sediment quality meeting baseline qualities.</p>
<p>Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining, or Production Operations</p> <p>The purpose of these Regulations is to regulate the determine and making of financial provision as contemplated in the Act for the costs associated with the undertaking of management, rehabilitation, and remediation of environmental impacts from prospecting, exploration, mining or production operations through the lifespan of such operations and latent or residual environmental impacts that may become known in the future.</p> <p>The Regulations also include detailed descriptions of the wording required in the documentation to support the provisioning for liability using Bank Guarantees and Trust Funds.</p> <p>Finally, the legislation also provides details on the information to be contained in the following plans:</p>	<p>Closure planning process will need to be expanded to include:</p> <ul style="list-style-type: none"> • Annual rehabilitation plan; • Final rehabilitation, decommissioning, and closure plan; • Environmental risk assessment report; and • Care and maintenance plan.

Legislation	Implications for Closure
<ul style="list-style-type: none"> • Annual rehabilitation plan; • Final rehabilitation, decommissioning, and closure plan; • Environmental risk assessment report; and • Care and maintenance plan. 	
<p>The National Environment Management: Air Quality Act (Act 39 of 2004)</p> <p>This Act regulates atmospheric pollution and repealed the Atmospheric Pollution Prevention Act. The Act came into full effect on 1 April 2010 and entrusts the Department of Environmental Affairs with the task of preventing pollution and ecological degradation, while at the same time promoting justifiable economic and social development. Metropolitan and District Municipalities are charged with issuing atmospheric emission licenses for certain listed activities. It must be shown that the best practical means are being employed to limit air pollution before these certificates will be issued. Penalties and criminal sanctions are imposed for non-compliance with the National Management: Air Quality Act.</p> <p>On 1 April 2010, the Department of Environmental Affairs established a list of activities, which require atmospheric emission licenses. The Department has published the minimum emission standards resulting from these listed activities. These include the permissible amount, volume, emission rate or concentration of that substance or mixture of substances that may be emitted into the atmosphere and the manner in which measurements of such emissions must be carried out. The consequences of the listing of these activities are that no person may, without a provisional atmospheric emission licence or an atmospheric emission license, conduct an activity listed on the list anywhere in the Republic or listed on the list applicable in a province anywhere in that province.</p>	<p>Other aspects of the NEM:AQA such as monitoring and application of management/mitigation measures may apply during closure.</p>
<p>The National Environmental Management: Biodiversity Act (Act 10 of 2004)</p> <p>The Act seeks amongst other things, to manage and conserve biological diversity, to protect certain species and ecosystems, to ensure the sustainable use of biological resources and to promote the fair and equitable sharing of benefits arising from bioprospecting involving those resources. The NEM:BA includes a Regulation related to the management of threatened and protected species. A similar Regulation is applied to Threatened Ecosystems. NEM:BA has a set of norms and standards for the development of management plans for both species (e.g., Threatened or Migratory Species) and ecosystems (Endangered or Critically Endangered).</p> <p>The National Environmental Management: Protected Areas Act (Act 57 of 2003)</p> <p>Protected areas such as nature reserves and special nature reserves are declared and managed in terms of this Act. Depending on the nature of the protected area, certain activities (such as mining) may require Ministerial consent or be prohibited outright. The Act also aims to promote the sustainable use of protected areas and the participation of local communities in such areas. In addition, it provides for the continued existence of the South African National Parks.</p>	<p>If relevant species or threatened ecosystems are presence on the prospecting concession, a management plan must be developed in alignment with these norms and standards.</p>

Legislation	Implications for Closure
<p>MPRDA 2002 Part II Social and Labour Plan</p> <p>The objectives of the social and labour plan are to:</p> <ul style="list-style-type: none"> • Promote employment and advance the social and economic welfare of all South Africans; • Contribute to the transformation of the mining industry; and • Ensure that holders of mining rights contribute towards the socio-economic development of the areas in which they are operating. <p>A SLP lodged with the Regional Manager is valid until a closure certificate has been issued in terms of section 43 of the Act.</p> <p>The contents of a social and labour plan relevant to closure includes:</p> <ul style="list-style-type: none"> • A human resources development programme; and • A local economic development programme; • Processes pertaining to management of downscaling and retrenchment which must include: <ul style="list-style-type: none"> ○ The establishment of the future forum; ○ Mechanisms to save jobs and avoid job losses; ○ Mechanisms to provide alternative solutions and procedures for creating job security where job losses cannot be avoided; ○ Mechanisms to ameliorate the social and economic impact on individuals, and ○ Regions and economies where retrenchment or closure of the mine is certain. <p>To provide financially for the implementation of the social and labour plan in terms of the implementation of:</p> <ul style="list-style-type: none"> • The human resource development programme; • The local economic development programmes; and • The processes to manage downscaling and retrenchment. 	<p>Provisions for the ongoing implementation of SLP commitments across the three core Social and Labour Action Plan content areas must be included in financial and resourcing commitments.</p>
<p>Marine Living Resources Act, 1998 (No. 18 of 1998)</p> <p>This Act provides for the conservation of marine ecosystems, the long-term sustainable utilisation of marine living resources and the orderly access to exploitation, utilisation and protection of certain marine living resources.</p>	<p>Closure planning activities must not unduly impact on the receiving environment, and all potential environmental impacts resulting from closure phase activities must be appropriately managed and mitigated, including potentially polluting substances generated during well plugging and abandonment, demobilization, and disposal of wastes and other substances emanating from closure phase activities</p>
<p>Marine Traffic Act, 1981 (No. 2 of 1981)</p> <p>This Act regulates marine traffic in South Africa’s territorial waters. It regulates the entry and dropping of anchor within 500 m safety zone of installations.</p>	<p>The proposed mining right is subject to an Environmental Authorisation, and as such a closure plan has been developed to mitigate and closure and post closure impacts.</p>

Legislation	Implications for Closure
<p>Marine Spatial Planning Act, 2018 (No. 16 of 2018) This Act provides a framework for marine spatial planning in South Africa and the development of marine spatial plans. The objectives of this Act are to (1) develop and implement a shared marine spatial planning system to manage a changing environment that can be accessed by all sectors and users of the ocean, (2) promote sustainable economic opportunities which contribute to the development of the South African ocean economy through coordinated and integrated planning, (3) conserve the ocean for present and future generations, and (4) facilitate responsible use of the ocean.</p>	<p>The proposed mining right is subject to an Environmental Authorisation, and as such a closure plan has been developed to mitigate and closure and post closure impacts.</p>
<p>National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008) The National Environmental Management: Integrated Coastal Management Act, 2008 (No. 24 of 2008) (NEM: ICMA) supports the authorisation requirements of NEMA but specifies additional criteria for regulating activities or developments and provides for pollution control within the coastal zone, where the coastal zone includes the Exclusive Economic Zone defined in the Maritime Zone Act.</p>	<p>The proposed mining right is subject to an Environmental Authorisation, and as such a closure plan has been developed to mitigate and closure and post closure impacts.</p>
<p>National Water Act (Act 36 of 1998) (NWA) Section 19 of the NWA sets out the principles for “an owner of land, a person in control of land or a person who occupies or uses land” to:</p> <ul style="list-style-type: none"> • Cease, modify or control any act or process causing pollution; • Comply with any prescribed waste standard or management practice; • Contain or prevent the movement of pollutants; • Remedy the effects of the pollution; and • Remedy the effects of any disturbance to the bed and banks of a watercourse. 	<p>This places the obligation to mitigate any aspects that cause or have caused pollution as well as to remediate any residual contaminated water at closure.</p>

4.1.1 Environmental Regulatory Requirements

The following closure obligations have been identified for BTP mining of concession 2C and 3C.

Obligation	Document Reference
A closure certificate has been issued for the diamond mining activities in Sea Concessions 2C – 5C, thus DBCM is no longer required to undertake monitoring of the natural recovery of the seabed in the mined areas. De Beers has, however, suggested that the applicant should consider using the previous monitoring sites as part of ongoing monitoring for the proposed mining operations.	Application for offshore diamond mining in sea concession 2C and 3C.
Ensure that the requirements of NEMA in terms of financial provision for remediation of environmental damage are met	Application for offshore diamond mining in sea concession 2C and 3C.
Take steps to share non-confidential data collected during the drilling programme (e.g. results of monitoring), if requested, to relevant agencies / regional or national programmes involved in biodiversity conservation / evaluation and management of marine ecosystems (including DEA, South African National Biodiversity Institute and appropriate research institutes).	Application for offshore diamond mining in sea concession 2C and 3C.
Undertake post-mining seabed (sidescan sonar) and benthic faunal community survey as per monitoring programme to demonstrate the natural recovery process of mined areas	Application for offshore diamond mining in sea concession 2C and 3C.
Dispose all waste retained onboard at a licensed waste site using a licensed waste disposal contractor	Application for offshore diamond mining in sea concession 2C and 3C.
Inform all key stakeholders that the mining vessel is off location	Application for offshore diamond mining in sea concession 2C and 3C.
Ensure that no construction debris or dropped equipment that may be detrimental to environment or other users of the sea is left on the seafloor.	Application for offshore diamond mining in sea concession 2C and 3C.
Providing sufficient funds to execute the EMPr in the event of premature closure or in the event that, on closure, the EMPr has not been successfully executed.	Application for offshore diamond mining in sea concession 2C and 3C.
Develop a Rehabilitation Monitoring Plan to demonstrate the natural recovery process by means of pre- and post-mining seabed (sidescan sonar) and benthic faunal community surveys. Use of the historic De Beers monitoring sites could be considered in a component of the monitoring plan.	Application for offshore diamond mining in sea concession 2C and 3C.
Given the nature of the proposed mining operations, no formal backfilling of the removed seabed sediments would take place.	Financial Provision and Closure Plan, 2016.

4.1.2 Interpretation of the Legislation

Legislation, as described in Table 4-1, influencing closure is varied, however, a common thread, is that after mitigation, the impacts of the operation on the environment need to be acceptable and the solutions implemented are required to be sustainable within the existing constraints presented by the biophysical environment.

As described below, closure objectives have been developed to support the closure vision, with these objectives developed to assist with complying with the various requirements of the legislation.

5 Closure Vision and Objectives

The closure vision for BPT is intended to inform the closure objectives.

VISION

The overall closure goal is to re-instate an area that is safe, stable, and non-polluting and not adversely affecting ocean water quality or the benthic zone.

The closure objectives are as follows:

- As BPT will be conducting off shore mining activities, no infrastructure will remain on the seabed or in the ocean;
- Sea beds will naturally recover with pre mining benthic faunal communities;
- Limit the impact on staff whose positions becomes redundant on closure; and
- Keep relevant authorities informed of the progress of the closure phase.

Active rehabilitation of the mined-out areas is not possible or considered necessary. Seabed sediments disturbed during the mining activities will remobilise and redistribute by wave base actions and ocean currents. Although no active rehabilitation will be undertaken during operation, activities will be monitored for habitat deterioration and seabed reinstatement. This will continue during closure, until relinquishment has been demonstrated and a closure certificate issued.

6 Alternatives

From a closure perspective, the BPT mining activities is not complex in that the risks are understood and can largely be mitigated at closure. The main closure activity will be the Benthic Zone consisting of seabed monitoring to demonstrate no long term negative impacts associated with the mining activities. No alternatives therefore exist at closure.

6.1 Closure and Post Closure Period

Once BPT have decided to apply for closure of the Mining Right, a Basic Assessment Process in terms of NEMA will be required. At this stage, all equipment and vessels, will be brought to harbour and removed from the waters. All infrastructure and equipment will be removed from the seabed, and no equipment will be left at sea, possibly impacting on future occupations in the area. The site will further undergo a one year post closure monitoring period, whereby Benthic Zone and sea bed monitoring will be undertaken.

Research has indicated that recovery rates of the biological communities disturbed by mining in the shallow marine areas is comparatively rapid; recovery periods ranging between 6 and 24 months, after which disturbed sites are statistically indistinguishable from adjacent, undisturbed sites. A closure period of two years has therefore been proposed.

In addition to the goals and objectives for final decommissioning and mine closure the vision for the post closure landform is to leave the site in as safe and self- sustaining a condition as possible and in a situation where no post-closure intervention is required.

6.2 Closure Assumptions

This closure plan has been developed based on available information including environmental data. Some of the information currently available may need to be supplemented during the operational period. Therefore, a number of assumptions were made about general conditions, and closure and rehabilitation of the facilities at the site to develop the proposed closure actions. As additional information is collected during operations, these assumptions will be reviewed and revised as appropriate.

The assumptions used to prepare this plan include the following:

- The closure period will commence once BPT has made a decision to stop mining activities and apply for closure in terms of the NEMA;
- No formal backfilling will be undertaken. Tailings will be deposited back the sea bed in the area where it was extracted. Natural redistribution will occur over a two year period;
- Sampling vessels will be required for operational and closure sampling. At closure vessels will take one day to mobilise to site and one day for monitoring;
- Closure monitoring will be undertaken quarterly for a two year period;
- As the nature of the mining right poses minimal risks at closure, it is assumed that no contamination of the surrounding water and seabed sediments have occurred;
- It is assumed that the Van Veel Grab sampler will be procured during the annual monitoring and will be utilised through the closure monitoring phase.

7 Final Concession Area Use

The assumption is made that the Post Closure Land Use (PCLU) will represent what occurred prior to mining activities as pre-mining conditions naturally reestablish after activities ceased.

8 Annual Rehabilitation Plan

This section addressed the NEMA Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations Government Gazette Notice No. 39425 issued on 20 November 2015. Chapter 2, Number 6(a) states:

Method for determining financial provision

6. An applicant must determine the financial provision through a detailed itemisation of all activities and costs, calculated based on the actual costs of implementation of the measures required for –

(a) annual rehabilitation, as reflected in an annual rehabilitation plan.

8.1 Annual Rehabilitation Plan Objectives

The objectives of the Annual Rehabilitation Plan (ARP) include the following:

- Establishment of rehabilitation and remediation goals and outcomes for the forthcoming 12 months after mining activities have started, which contribute to the gradual achievement of the post-mining activities, closure vision and objectives identified in the holder's final rehabilitation, decommissioning and closure plan;
- Establishment of a plan, schedule, and budget for rehabilitation for the next 12 months of mining;
- Evaluation and determining the costs of rehabilitation for the 12-month period and for closure for the purposes of supplementing the financial provision guarantee or other financial provision instruments;
- Provide an initial annual rehabilitation plan which will be used as a starting point to be updated on an annual basis during construction and operation; and
- Set targets to be achieved during the first year of invasive prospecting activities.

8.2 Review of Previous Rehabilitation Activities

This is the first assessment undertaken by BPT in terms of GNR1147, therefore no previous annual rehabilitation plans have been compiled. This ARP will be used as part of the annual review, which will determine the rehabilitation requirements for the forthcoming 12 month.

8.3 Activities to be Undertaken during Year 1

At the time of compilation of this report, mining activities have occurred within the concession area. It is anticipated that BPT will continue with the mining in concession 2C and 3C. Annual liability costs are limited to the monitoring of the benthic biodiversity, sediment sampling and reporting. Sampling will be undertaken in target areas previously completed, quarterly (8 samples per quarter) during the next 12 month period. Taking into consideration the mining methodology and the expected use of the mining vessel, an additional survey vessel will be required for sampling purposes.

The sampling vessel operator is likely to be required to obtain and maintain Protection and Indemnity (P&I) Insurance for emergencies (Vessel collision, oil spills etc), with this expected to cover rehabilitation costs associated with accidental spills etc. The costs of the insurance is assumed to be

an operating cost and does not form part of the annual rehabilitation. The following annual liability costs are foreseen as indicated in Table 8-1.

Table 8-1: Annual Liability Costs

Activities	Annual
Vessel Hire	R708 400.00
Equipment (inc Van Veel Grab)	R8 731.54
Benthic Zone Sampling	R191 520.00
Laboratory Costs	R49 588.00
Reporting	R200 000.00
Subtotal	R1 158 239.54
Preliminary and General (10%)	R115 823.95
Contingencies (6%)	R69 494.37
Total (Excluding VAT)	R1 343 557.86

9 Environmental Risk Assessment

Currently no identified latent risk is associated with the mining operations in the sea concession. The latent risk liability is therefore **R0**.

10 Closure Actions

10.1 Associated Infrastructure and Equipment

The following closure actions relate to infrastructure:

- All infrastructures and equipment will be retrieved and removed from the concession and particularly the concessions seafloor;
- The tools, machines, vessels and equipment to be closed should be assessed and handled in an individual manner.
- A seabed contamination investigation will be conducted on completion of activities, particularly in area where invasive activities took place. The purpose of this is to identify areas of possible contamination and design and implement appropriate remedial measures to ensure that the closure criteria are obtained;
- Excavations remaining following trawling activities will be filled with sediment that will be discarded; and
- Vessels will be strategically positioned to place tailings directly back into the excavations that remain.

10.2 Remediation of Contaminated Areas

Following prospecting activities, a seafloor assessment will be undertaken to determine if any seafloor contamination has occurred. The following actions will be undertaken to mitigate risks associated with contamination should it have occurred:

- Contaminated sediment will be identified, excavated, if possible, to at least 200 mm below the contaminated zone and then treated or disposed of; and
- Removed sediment will be managed as determined by the nature and extent of the contamination.

10.3 Flora on the Seafloor

Successful reestablishment of the seabed will help, maintain productivity, and reduce sediment dispersion. Once all decommissioning activities have been undertaken, it is expected that flora will re-establish in the area, and no invasive rehabilitation will be required.

10.4 Waste Management

Waste management activities will include:

- Hazardous waste will be disposed of on land off-site;
- Uncontaminated tailings will be used to backfill excavations resulting from trawling activities, directly.

10.5 Specialist Studies

In terms of the NEMA, an EA will be required for completion of the mining works programme. This will most likely result in the need of a Basic Assessment Process. Following a positive decision made by the regulators, BPT can apply for a closure certificate in terms of the NEMA and MPRDA. The following additional studies have been included in the Closure Plan liability costing:

- Closure and Decommissioning Environmental Impact Assessment .

10.6 Monitoring

Provision has been made for the following monitoring activities:

- Sediment, seabed, and benthic monitoring during closure.

11 Threats, Opportunities, and Uncertainties

As the closure plan is currently being developed with no plan of closure in the near future, and the plan is based on current impacts rather than actual impacts measured as closure approaches, there are a number of assumptions that have been made around the biophysical and socio-economic environment that will exist at the end of the life of operations. These assumptions represent uncertainties, but also represent areas where there may be threats and opportunities that cannot at this stage be adequately defined. The guideline in the regulations requires that a list of these uncertainties, threats, and opportunities be identified and maintained during subsequent revisions of the closure plan. BPT understands that the purpose of this list is to inform future revisions of the plan relating to the focus of resource. During these revisions, it is expected that resources can be focused to determine whether either the threats or opportunities are realised and whether uncertainties are addressed. The uncertainties, threats and opportunities are reflected in Table 11-1.

Table 11-1: Threats and opportunities relating to closure.

	Opportunities	Threats
Biophysical	<ul style="list-style-type: none"> Natural processes will redistribute sediment returned to the ocean floor and flora and fauna are expected to naturally recolonise disturbed areas 	<ul style="list-style-type: none"> Unnecessary disturbance of the seabed floor, leading to additional closure requirements. Contamination of the sea floor bed, leading to additional closure requirements.
Economic	<ul style="list-style-type: none"> Opportunity to upskill employees, strengthening post mining employment opportunities. 	<ul style="list-style-type: none"> Changing political environment; and The closure costs may increase as legislation becomes more stringent.
Other		<ul style="list-style-type: none"> Changing legislation; Inconsistent enforcement of legislation; and Inability to obtain a closure certificate as mining closures.
Uncertainty	<ul style="list-style-type: none"> Unknown impact on sea bed and Benthic Zone during mining activities. 	

12 Final Rehabilitation, Decommissioning, and Closure Schedule of Actions

12.1 Closure Schedule

A schedule of actions for final rehabilitation, decommissioning and closure will continue over a two year period. Closure actions will focus on monitoring of the seabed and Benthic Zone. It is assumed that eight sets of monitoring will be undertaken over a two year period.

12.2 Organisational Capacity and Capacity Building

BPT will ensure that the personnel with the correct capacity and experience will be employed. It is therefore expected that there will not likely be a need for internal capacity building at this stage, with this being re-evaluated in future iterations of the closure documentation.

BPT will at the appropriate time, embark on a capacity building program with stakeholders so that stakeholders are in a position to understand the risks that may exist at closure and limitations around risk mitigation strategies and that the stakeholders are able to provide meaningful input to engagements around possible post closure activities.

13 Identified Gaps in the Plan

As documented in Section 6.2, a number of assumptions were required to develop this plan. The existence of these assumptions is that there is not sufficient information for definitive actions to be developed. Information therefore needs to be collected to confirm the assumptions and develop the assumptions into closure actions.

14 Closure Criteria

Following the implementation of the closure actions described in Section 10, it is necessary to have measurable criteria against which to assess the effectiveness of the plan and its implementation. These criteria will assist BPT in identifying when the standard of closure is achieved. The criteria for the mining activities are documented in Table 14-1. Also included in the table are the indicators required to demonstrate achievement with the criteria and the reporting requirements. The reporting requirements are those that are expected to fulfil the monitoring requirements set out by legislation.

Table 14-1: Closure criteria.

Category	Closure criteria	Indicators	Reporting requirements
Sediment quality	Sediment quality as assessed against baseline conditions.	Sediment quality is aligned with pre mining conditions.	Results of sediment quality and risk assessment.
Flora	Establishment of the Benthic Zone.	Species cover and composition aligned to the pre prospecting environment.	Monitoring report.
Equipment	Removal of equipment from the sea bed.	No remnants of equipment remains in the concession area.	Visual Assessment

15 Closure Cost Estimate

15.1 Estimate of Liability

Closure activities relating to the mining activities are limited. Concurrent rehabilitation will occur as a result of the mining activities where rejects are returned to the seabed during mining, thereby limiting the need for closure activities once closure is sought for the Mining Right. Active and mechanical rehabilitation is not feasible or practical as the disturbance to the seabed will re-establish as a result of ocean currents and wave actions within 24 months.

Closure actions are limited to monitoring of the Benthic Zone, sediment and seabed topography. The liability assessment was calculated using existing equipment and vessel hiring rates as well as typical consulting costs for monitoring and reporting. It is assumed that the sampling equipment procured during operation will be utilised during the two year closure period.

Table 15-1: Summary of closure liability (Excluding VAT).

Activities	Final Closure and Decommissioning	Latent Risk
Vessel Hire	R1 416 800.00	R0.00
Benthic Zone Sampling	R383 040.00	R0.00
Sediment Sampling	R99 176.00	R0.00
Laboratory Costs	R400 000.00	R0.00
Reporting	R420 000.00	R0.00
Specialist Studies	R750 000.00	R0.00
Subtotal	R3 469 016.00	R0.00
Preliminary and General (10%)	R346 901.60	R0.00
Contingencies (6%)	R208 140.96	R0.00
Total (Excluding VAT)	R4 024 058.56	R0.00

15.2 Monitoring, Auditing, and Reporting

SRK's understanding of the regulations is that there are two requirements under this category. The first relates to monitoring, auditing, and reporting on future revisions to this plan, which is required annually and the second monitoring and reporting on the monitoring required achieving relinquishment criteria. Both these requirements are discussed in this section.

15.3 Monitoring, auditing, and reporting to on future revisions

SRK's interpretation of the regulation is that there are three sets of reviews to which the plan must be subjected to on an annual basis. These audits and their purpose as understood by SRK are:

- Internal monitoring, auditing, and reporting – a review undertaken by BPT or appointed consultant to update the plan to account for changes to the environment and risk profile and to update the liability assessment to reflect liability at that point in time;
- External monitoring, auditing, and reporting – a review undertaken by the financial auditors as part of the annual financial/accounting audit to determine that the plan is appropriate, and that the quantum of the liability is included in the operations provisions; and
- Legislated audits – these are the auditing requirements of the Act, Regulation, EIA/EMPr and Environmental Authorisations. Pertinent aspects relating to closure, such as changes to the

risk assessment, changes in closure options and changes in the quantum of the liability will be reported.

The current planning for these audits is presented in Table 15-2. It is currently envisaged that findings of the audit will be reported on within three months of the audit (likely date in the table).

Table 15-2: Schedule of planned audits.

Audit	Internal Responsibility	Frequency	Likely date
Internal	Environmental manager	Annual	Q3 of financial year
External	Financial manager	Annual	Q4 of financial year
Legislated	Environmental Manager	Annual	Q1 of following year

The findings from the various audits will be captured in the operations Environmental Management System (EMS) and responsibilities, and timelines will be allocated to the rectification of the findings, as practical. Once addressed, these findings will be closed out in a manner similar to the other findings captured in the EMS and will not be closed out until a second party has assessed that the finding is appropriately addressed.

15.4 Monitoring, auditing, and reporting to track relinquishment progress

The objective of the monitoring programme will be to track the recovery of the site towards the long-term post-closure Concession Area use goals, in accordance with the overall closure objectives. The monitoring programme will be designed to collect information to demonstrate that the relinquishment criteria have been achieved. The anticipated monitoring will include:

- **Benthic Zone monitoring:** Conditions of the Benthic Zone will be monitored in accordance with international guidelines to determine the species composition and status quo. Results will be compared to the Benthic Zones similar to that of a reference analogue site established in a similar ecotype, conducted quarterly for two years post-closure period;
- **Seafloor sediment quality monitoring:** Seafloor sediment will be assessed for contamination prior to closure and areas contaminated assessed against baseline conditions. Accessible areas of seafloor sediment contamination will be assessed during operation.

Quarterly reports will be prepared to document the results of the monitoring during the closure and post-closure phases. These reports will provide important information required to manage the on-going closure activities, with the data and reports being used to:

- Provide recommendations for improving subsequent rehabilitation activities;
- Indicate where rehabilitation and closure activities have not been successful, requiring a potential change in design criteria;
- Indicate if relinquishment criteria have been achieved.

16 Conclusions

The liability for BPT has been assessed and is reported on in this document. SRK estimates that the current liability for closure is **R4 024 058.56** which includes a provision of **R555 042.56** for Contingencies and P&G. SRK is of the opinion that the estimate of **R4 024 058.56** will comply to the requirements of the Financial Provision Regulations, when they are enforced.

Prepared by

SRK Consulting - Certified Electronic Signature

 **srk consulting**
 13020/45556/Report
 010-4913-4448-CADD-23/09/2024
 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



Andrew Caddick
 Principal Scientist

Reviewed by

SRK Consulting - Certified Electronic Signature

 **srk consulting**
 613020/45556/Report
 4129-5411-1463-LAKJ-23/09/2024
 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



James Lake
 Partner

All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

17 References

- Anderson, T.J., Morrison, M., MacDiarmid, A., *et al.* (2019). *Review of New Zealand's key biogenic habitats*. National Institute of Water and Atmospheric Research. Wellington.
- Augustyn, C.J. (1991). The biomass and ecology of chokka squid *Loligo vulgaris reynaudii* off the west coast of South Africa. *African Zoology*. 26(4): 164-181.
- Awad, A.A., Griffiths, C.L. & Turpie, J.K. (2002). Distribution of South African marine benthic invertebrates applied to the selection of priority conservation areas. *Diversity and Distributions*. 8(3): 129-145.
- Bailey, G.W., De B. Beyers, C.J. & Lipschitz, S.R. (1985). Seasonal variation of oxygen deficiency in waters off southern South West Africa in 1975 and 1976 and its relation to the catchability and distribution of the Cape rock lobster *Jasus lalandii*. *South African Journal of Marine Science*. 3(1): 197-214.
- Birch, G.F., Rogers, J., Bremner, J.M. & Moir, G.J. (1976). Sedimentation controls on the continental margin of Southern Africa. First Interdisciplinary Conf. Mar. *Freshwater Res. S. Afr.*, 20: 1-12.
- Bluck, B.J., Ward, J.D., Cartwright, J. & Swart, R. (2007). The Orange River, southern Africa: an extreme example of a wave-dominated sediment dispersal system in the South Atlantic Ocean. *Journal of the Geological Society*. 164(2): 341-351.
- Carr, M.E. (2002). Estimation of potential productivity in Eastern Boundary Currents using remote sensing. *Deep Sea Research Part II: Topical Studies in Oceanography*. 49(1-3): 59-80.
- Chapman, P. & Shannon, L.V. (1985). *The Benguela ecosystem*. 2. Chemistry and related processes. In *Oceano*.
- CMS. (1999). (<https://www.cms.int/atlantic-turtles/en/legalinstrument/atlantic-turtles-mou>) [accessed 15/04/2023].
- Cohen, L.A., Pichegru, L., Grémillet, D., *et al.* (2014). Changes in prey availability impact the foraging behaviour and fitness of Cape gannets over a decade. *Marine Ecology Progress Series*. 505: 281-293.
- Compagno, L.J.V., Ebert, D.A. & Cowley, P.D. (1991). Distribution of offshore demersal cartilaginous fish (Class Chondrichthyes) off the west coast of southern Africa, with notes on their systematics. *South African Journal of Marine Science*. 11(1): 43-139.
- Crawford, R.J.M. and Whittington, P.A., 2005. African Penguin. Roberts birds of southern Africa, pp.439-441
- DFFE, SANBI & NMU. (2022). National Coastal and Marine Spatial Biodiversity Plan: Securing South Africa's coastal and marine biodiversity to support development and sustainable resource use. SANBI Factsheet Series. South African National Biodiversity Institute. Pretoria.
- Dingle, R.V. & Nelson, G. (1993). Sea-bottom temperature, salinity and dissolved oxygen on the continental margin off south-western Africa. *South African Journal of Marine Science* .13(1): 33-49.
- Findlay, K.P. (1989). *The distribution of cetaceans off the coast of South Africa and South West Africa/Namibia*. PhD dissertation. University of Pretoria.