

ROBBEN ISLAND MUSEUM

**PROPOSED ROBBEN ISLAND  
WASTEWATER TREATMENT PLANT  
(REF: 14/12/16/3/3/3/404)  
ENVIRONMENTAL MANAGEMENT  
PROGRAMME**

20 OCTOBER 2022

FINAL





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ISLAND WASTEWATER  
TREATMENT PLANT  
(REF:  
14/12/16/3/3/3/404)

ENVIRONMENTAL  
MANAGEMENT  
PROGRAMME

ROBBEN ISLAND MUSEUM

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WSP  
THE PAVILION, 1ST FLOOR  
CNR PORTSWOOD AND BEACH ROAD, WATERFRONT  
CAPE TOWN, 8001  
SOUTH AFRICA

T: +27 21 481 8700  
F: +086 606 7121  
WSP.COM

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Prepared by	Jennifer Green	<u>Jennifer Green</u>		
Signature			pp	
Checked by	Jacqui Fincham	<u>Jacqui Fincham</u>		
Signature				
Authorised by	Jacqui Fincham	<u>Jacqui Fincham</u>		
Signature				
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# SIGNATURES

PREPARED BY

pp

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Jennifer Green  
Senior Consultant

REVIEWED BY

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Jacqui Fincham  
Director (Environmental Assessment Practitioner)

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# TABLE OF CONTENTS

1	INTRODUCTION .....	1
1.1	Project Background .....	1
1.2	Terms of Reference and Details of the EAP .....	3
1.3	Environmental Management Programme Structure.....	3
1.4	Applicable Documentation .....	5
2	LEGAL FRAMEWORK.....	6
3	PROJECT DESCRIPTION .....	13
3.1	Current Operations .... Error! Bookmark not defined.	
3.2	Proposed expansion Operations .. Error! Bookmark not defined.	
4	IMPACT ASSESSMENT .....	31
5	ENVIRONMENTAL MANAGEMENT OBJECTIVES.....	31
5.1	EMPR Objectives .....	34
5.2	Environmental Objectives .....	34
6	MANAGEMENT PROCEDURES AND ADMINISTRATIVE REQUIREMENTS .....	36
6.1	Organisational Structure and Responsibilities ..	36
6.2	Environmental Awareness Plan .....	37
6.3	Monitoring .....	39
6.4	Non-Conformance and Corrective Action .....	39
6.5	Documentation and Reporting .....	40
7	ENVIRONMENTAL MANAGEMENT PROGRAMME .....	41
7.1	Site Specific Control Measures.....	41
7.2	Management Plans .....	67

## 8 CONCLUSION ..... 69

### TABLES

TABLE 1-1:	DETAILS OF THE EAP .....	3
TABLE 1-2:	LEGISLATION REQUIREMENTS AS DETAILED IN APPENDIX 4 OF GNR 326 .....	3
TABLE 2-1:	APPLICABLE LEGISLATION .....	6
TABLE 2-2:	APPLICABLE POLICIES .....	10
TABLE 3-1:	CO-ORDINATES OF CORNER POINTS OF THE WWTW .....	13
TABLE 3-2:	CO-ORDINATES OF THE EXISTING PIPELINE .....	13
TABLE 3-3:	LIMITS OF DETERMINATES IN DISCHARGED EFFLUENT .....	24
TABLE 9-4:	IMPACT SUMMARY .....	31
TABLE 6-1:	ROLES AND RESPONSIBILITIES .....	36
TABLE 7-1:	STRUCTURE OF THE EMPR .....	41
TABLE 7-2:	ENVIRONMENTAL MANAGEMENT PROGRAMME ..	42

### FIGURES

FIGURE 1-1:	LOCATION OF THE EXISTING AND PROPOSED WWTW INFRASTRUCTURE ON ROBBEN ISLAND .....	2
FIGURE 3-1:	LAYOUT OF THE WWTW AND EXISTING SEWER OUTFALL .....	15
FIGURE 3-2:	LAYOUT OF THE PROPOSED WWTW INFRASTRUCTURE .....	17
FIGURE 3-3:	CROSS-SECTION OF THE PROPOSED WWTW INFRASTRUCTURE .....	19
FIGURE 3-4:	TYPICAL EXAMPLE OF WWTW .....	20
FIGURE 3-5:	3D RENDERING OF THE PROPOSED WWTW FOR ROBBEN ISLAND .....	21
FIGURE 3-6:	SCHEMATIC LAYOUT OF THE PROPOSED WWTW .....	22
FIGURE 3-7:	ILLUSTRATIVE REPRESENTATION OF ROTATING BIOLOGICAL CONTACTORS .....	23
FIGURE 3-8:	CROSS SECTION OF THE HUMUS TANK .....	23



FIGURE 3-9: PROCESS FLOW FOR THE PROPOSED WWTW .....25

FIGURE 3-10: SITE LOCALITY MAP AND CONSTRUCTION CAMP LAYOUT .....27

FIGURE 7-1: LOCATION OF VEGETATED EARTH MOUND .....65

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*APPENDICES*

**1** EAP CV



# 1 INTRODUCTION

All changes made from the Draft EMPr have been underlined for easy reference in this Final EMPr.

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## 1.1 PROJECT BACKGROUND

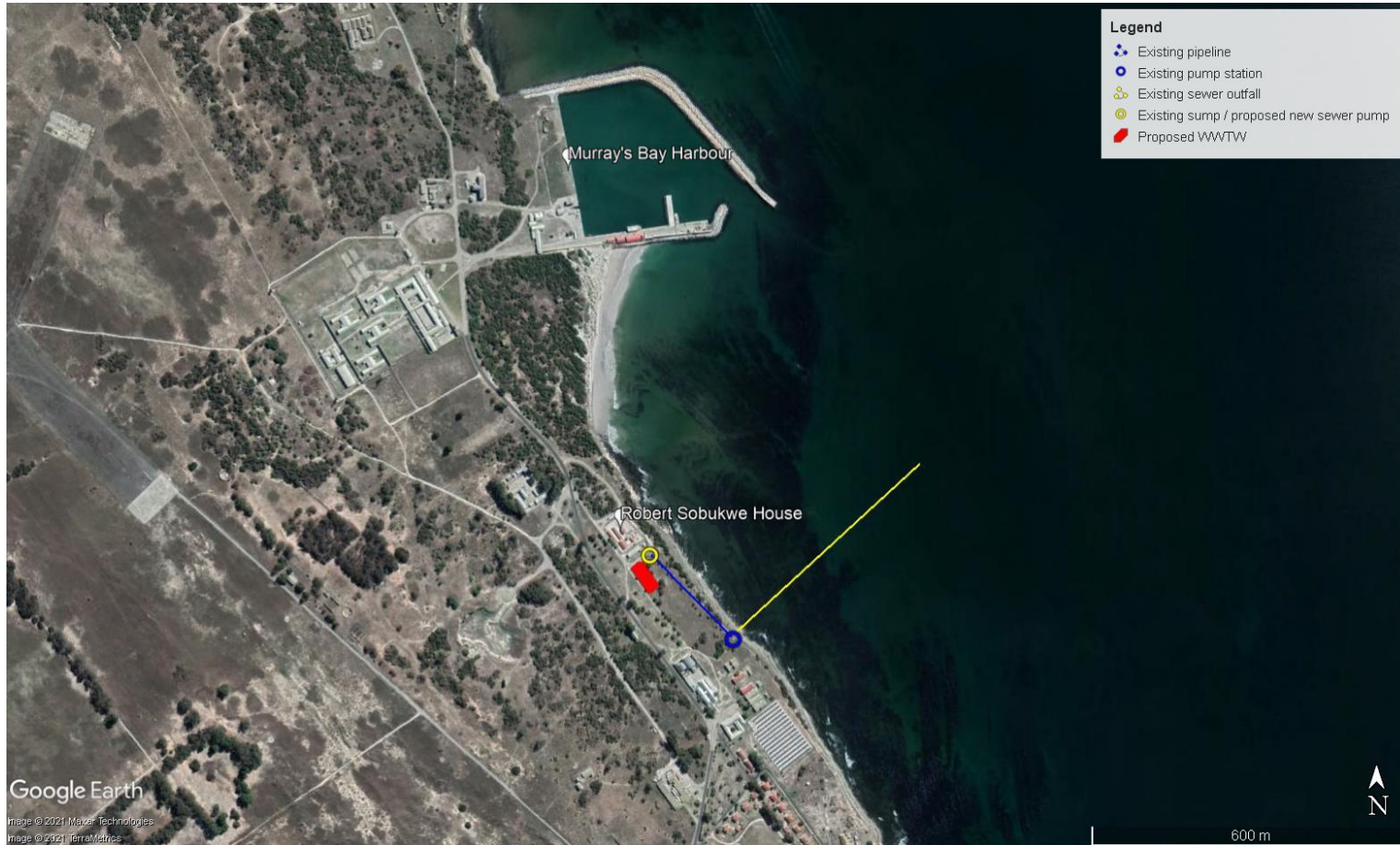
**This is a repeat application for an Environmental Authorisation that has expired (Ref: 14/12/16/3/3/3/83).**

There is currently no formal Wastewater Treatment Works (WWTW) on Robben Island. All sewage is pumped by six pump stations to a collection sump near Robert Sobukwe's former residence, where it is macerated and pumped along the outfall sewer pipeline to discharge through a diffuser 465 m offshore.

The proponent, Robben Island Museum (RIM), therefore proposes to construct a WWTW with a daily throughput capacity of 300m<sup>3</sup> per day on the eastern side of Robben Island in Table Bay. Treated effluent will gravitate to the existing sewage collector sump at the proposed WWTW site from where it will be pumped along the existing outfall sewer pipeline to discharge through a diffuser 465 m offshore. The project site is bounded to the northeast by Murray's Bay beach (80 m), to the north by the Dog Unit (Robert Sobukwe Complex) (30 m), to the west by Murray's Road (50 m) and to the south by the Robben Island village (400 m) (**Figure 1-1**).

A Basic Assessment (BA) was previously undertaken by WSP in 2014/15. An Environmental Authorisation (EA) was secured for the proposed WWTW on 27 March 2015 and an extension was granted on 27 March 2018 (Ref: 14/12/16/3/3/3/83). The WWTW authorised in the EA was for a treatment capacity of 108,000 m<sup>3</sup> per annum with all the effluent generated on the Island discharged via a marine outfall into the coastal environment after treatment. The design allowed for a maximum discharge volume of 300m<sup>3</sup> per day. The EA states "*this activity must commence within a period of five (5) years from the date of EA issued on 27 March 2015 (i.e. the EA lapses on 27 March 2020). If the commencement of the activities does not occur within that period, the authorisation lapses and a new application for environmental authorisation must be made in order for the activity to be undertaken.*" Due to unforeseen circumstances, the project did not commence by the expiry date of 27 March 2020 and the EA subsequently lapsed. RIM is therefore required to apply for a new EA.

The proposed WWTW requires an Integrated Environmental Authorisation (IEA) and Waste Management Licence (WML) in terms of the National Environmental Management Act (Act 107 of 1998), as amended (NEMA) and the associated Environmental Impact Assessment (EIA) Regulations, 2014, as amended as well as the National Environmental Management Waste Act (Act 59 of 2008) (NEMWA). WSP Group Africa (Pty) Ltd (WSP) has been appointed by RIM as the independent Environmental Assessment Practitioner (EAP) to facilitate the BA process in accordance with the EIA Regulations, 2014, as amended.



**Figure 1-1: Location of the existing and proposed WWTW infrastructure on Robben Island**

## 1.2 TERMS OF REFERENCE AND DETAILS OF THE EAP

WSP was appointed in the role of Independent EAP to undertake the BA processes for the proposed Project. This Stakeholder Engagement Report was compiled as part of the BA process and must be read in conjunction with the Basic Assessment Report (BAR) in support of the EA application. The CV of the EAP is attached as **Appendix 1**. The EAP declaration of interest and undertaking is included in Appendix L of the BAR. **Table 1-1** details the relevant contact details of the EAP.

**Table 1-1: Details of the EAP**

EAP	WSP GROUP AFRICA (PTY) LTD
Company Registration:	1999/008928/07
Contact Person:	Jacqui Fincham
Physical Address:	The Pavilion, Corner of Portswood and Beach Road, V&A Waterfront, Cape Town, 8001
Postal Address:	PO Box 2613, Cape Town, 8000
Telephone:	+27 21 481 8795
Fax:	+27 21 481 8799
Email:	Jacqui.Fincham@wsp.com

To adequately identify and assess potential environmental impacts, the EAP was supported by an Air Quality Specialist, Heritage Specialist, Aquatic Specialist and Visual Impact Specialist, the details of whom are provided in the BAR.

### STATEMENT OF INDEPENDENCE

Neither WSP nor any of the authors of this Report have any material present or contingent interest in the outcome of this Report, nor do they have any business, financial, personal or other interest that could be reasonably regarded as being capable of affecting their independence. WSP has no beneficial interest in the outcome of the assessment.

## 1.3 ENVIRONMENTAL MANAGEMENT PROGRAMME STRUCTURE

**Table 1-2** cross-references the sections within the Environmental Management Programme Report (EMPr) with the legislated requirements as per Appendix 4 of GNR 326.

**Table 1-2: Legislation Requirements as Detailed in Appendix 4 of GNR 326**

APPENDIX 4	LEGISLATED REQUIREMENTS AS PER THE NEMA GNR 326	RELEVANT REPORT SECTION
(a)	Details of	
	the EAP who compiled the EMPr; and	Section 1.2 and Appendix 1
	the expertise of the EAP, including a Curriculum Vitae	Section 1.2 and Appendix 1

**APPENDIX 4 LEGISLATED REQUIREMENTS AS PER THE NEMA GNR 326**

**RELEVANT  
REPORT SECTION**

(b)	Detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 3
(c)	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Section 3 No environmental sensitivities on site
(d)	A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-	Section 3, 4, 5 & 7
	Planning and design;	
	Pre-construction activities;	
	Construction activities	
	Rehabilitation of the environment after construction and where applicable post closure; and	
	Where relevant, operation activities.	
(e)	A description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Section 7
(f)	A description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to -	Section 7
	Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	
	Comply with any prescribed environmental management standards or practices;	
	comply with any applicable provisions of the Act regarding closure, where applicable; and	
	Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable	
(g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 6
(h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 6
(i)	An indication of the persons who will be responsible for the implementation of the impact management actions;	Section 6 Section 7
(j)	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 7
(k)	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 6

**APPENDIX 4 LEGISLATED REQUIREMENTS AS PER THE NEMA GNR 326****RELEVANT  
REPORT SECTION**

(l)	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations	Section 6
(m)	An environmental awareness plan describing the manner in which-	
	The applicant intends to inform his or her employees of any environmental risk which may result from their work; and	Section 6
	Risks must be dealt with in order to avoid pollution or the degradation of the environment; and	
(n)	any specific information that may be required by the competent authority	N/A

## 1.4 APPLICABLE DOCUMENTATION

The following documents are to be read in conjunction with the EMPr:

- Basic Assessment Report (BAR) for the proposed Wastewater Treatment Works; and
- Integrated Environmental Authorisation issued by the Department of Forestry, Fisheries and the Environment (DFFE) in terms of NEMA and NEMWA (*still to be issued*).

## 2 LEGAL FRAMEWORK

The South African regulatory framework establishes well-defined requirements and standards for environmental and social management of industrial and civil infrastructure developments. Environmental protection functions are carried out by different authorities at both national and regional levels. The applicable legislation and policies are shown in **Table 2-1** below.

**Table 2-1: Applicable Legislation**

APPLICABLE LEGISLATION	DESCRIPTION OF LEGISLATION
<b>The Constitution of South Africa (No. 108 of 1996)</b>	Section 24(b) of the Constitution provides that “ <i>everyone has the right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation [and] promote conservation.</i> ” The Constitution cannot manage environmental resources as a stand-alone law, hence additional legislation has been promulgated in order to manage the various spheres of both the social and natural environment. Each promulgated Act and associated Regulations are designed to focus on various industries or components of the environment to ensure that the objectives of the Constitution are effectively implemented and upheld in an on-going basis throughout the country. In terms of Section 7, a positive obligation is placed on the State to give effect to the environmental rights.
<b>National Environmental Management Act (No. 107 of 1998)</b>	<p>In terms of Section 24(2) of the National Environmental Management Act (No. 107 of 1998) (NEMA), the Minister may identify activities which may not commence without prior authorisation. On 7 April 2017, the Minister thus published GNR 327 (Listing Notice 1), 325 (Listing Notice 2) and 324 (Listing Notice 3) listing activities that may not commence prior to authorisation. The regulations outlining the procedures required for authorisation are published in GNR 326 EIA Regulations (2014, as amended). Listing Notice 1 and Listing Notice 3 identify activities that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 2 identifies activities that require a Scoping and EIA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity.</p> <p><b>Listed Activities 15, 17 and 19A of GNR 327</b> are considered applicable to the Robben Island WWTW and therefore a BA process must be followed to obtain an IEA.</p>
<b>Listing Notice 1: GNR 327</b>	<p><b>Activity 15:</b></p> <p><i>The development of structures in the coastal public property where the development footprint is bigger than 50 square metres, excluding—</i></p> <ul style="list-style-type: none"> <li>(i) <i>the development of structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</i></li> <li>(ii) <i>the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;</i></li> <li>(iii) <i>the development of temporary structures within the beach zone where such structures will be removed within 6 weeks of the commencement of development and where coral or indigenous vegetation will not be cleared; or</i></li> <li>(iv) <i>activities listed in activity 14 in Listing Notice 2 of 2014, in which case that activity applies.</i></li> </ul> <p><b>Applicability:</b></p> <p>The proposed WWTW infrastructure will be more than 50m<sup>2</sup> and is located on Robben Island, which is defined to be Coastal Public Property. Therefore, this activity is triggered.</p> <p><b>Activity 17:</b></p> <p><i>Development—</i></p>



**APPLICABLE  
LEGISLATION**

**DESCRIPTION OF LEGISLATION**

	<p>(i) <i>in the sea;</i></p> <p>(ii) <i>in an estuary;</i></p> <p>(iii) <i>within the littoral active zone;</i></p> <p>(iv) <i>in front of a development setback; or</i></p> <p>(v) <i>if no development setback exists, within a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever is the greater;</i></p> <p><i>in respect of—</i></p> <p>a) <i>fixed or floating jetties and slipways;</i></p> <p>b) <i>tidal pools;</i></p> <p>c) <i>embankments;</i></p> <p>d) <i>rock revetments or stabilising structures including stabilising walls; or</i></p> <p>e) <i>infrastructure or structures with a development footprint of 50 square metres or more —</i></p> <p><i>but excluding—</i></p> <p>(aa) <i>the development of infrastructure and structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</i></p> <p>(bb) <i>where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;</i></p> <p>(cc) <i>the development of temporary infrastructure or structures where such structures will be removed within 6 weeks of the commencement of development and where coral or indigenous vegetation will not be cleared; or</i></p> <p>(dd) <i>where such development occurs within an urban area.</i></p> <p><b>Applicability:</b></p> <p>The proposed WWTW infrastructure will be greater than 50m<sup>2</sup> and will be constructed within a distance of 100 metres inland of the high-water mark of the sea. This activity is therefore triggered.</p>
	<p><b>Activity 19A:</b></p> <p><i>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from —</i></p> <p>(i) <i>the seashore;</i></p> <p>(ii) <i>the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater;</i> <i>or</i></p> <p>(iii) <i>the sea; —</i></p> <p><i>but excluding where such infilling, depositing, dredging, excavation, removal or moving—</i></p> <p>(f) <i>will occur behind a development setback;</i></p> <p>(g) <i>is for maintenance purposes undertaken in accordance with a maintenance management plan;</i></p> <p>(h) <i>falls within the ambit of activity 21 in this Notice, in which case that activity applies;</i></p> <p>(i) <i>occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or</i></p> <p><i>where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.</i></p>

**APPLICABLE  
LEGISLATION****DESCRIPTION OF LEGISLATION**

	<p><b>Applicability:</b></p> <p>The proposed WWTW will be constructed within 100m of the high-water mark of the sea and more than 5 m<sup>3</sup> of material will be excavated as part of construction. This activity is therefore triggered.</p>
<b>National Environmental Management Waste Act (No. 59 of 2008)</b>	<p>The National Environmental Management Waste Act (No. 59 of 2008) (NEMWA) is subsidiary and supporting legislation to NEMA. NEMWA is a framework legislation that provides the basis for the regulation of waste management. NEMWA also contains policy elements and gives a mandate for further regulations to be promulgated.</p> <p>On 29 November 2013, GN 921: <i>NEMWA List of waste management activities that have, or are likely to have, a detrimental effect on the environment</i> was published. The proposed WWTW, specifically the proposed drying beds for the sludge, will trigger Category A, Item (1) “the storage of general waste in lagoons” of GNR 921 and will therefore require a Waste Management Licence (WML).</p> <p>In addition, waste handling, storage and disposal during the construction and operational phase of the project must be undertaken in accordance with the requirements of this Act and the Best Practicable Environmental Option (BPEO) which will be incorporated into the site-specific Environmental Management Programme (EMPr).</p>
<b>National Environmental Management Biodiversity Act (No. 10 of 2004)</b>	<p>The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) was promulgated in June 2004, within the framework of NEMA, to provide for the management and conservation of national biodiversity. NEMBA’s primary aims are for the protection of species and ecosystems that warrant national protection, the sustainable use of indigenous biological resources, and the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources. In addition, NEMBA provides for the establishment and functions of the South African National Biodiversity Institute (SANBI). SANBI was established primarily to report on the status of the country’s biodiversity and conservation status of all listed threatened or protected species and ecosystems.</p> <p>The National Coastal and Marine Spatial Biodiversity Plan<sup>1</sup> comprises a map of Critical Biodiversity Areas (CBAs), Ecological Support Area (ESAs) and accompanying sea-use guidelines. The CBA Map presents a spatial plan for the marine environment, designed to inform planning and decision-making in support of sustainable development. The sea-use guidelines enhance the use of the CBA Map in a range of planning and decision-making processes by indicating the compatibility of various activities with the different biodiversity priority areas so that the broad management objective of each can be maintained. The intention is that the CBA Map (CBAs and ESAs) and sea-use guidelines inform the MSP Conservation Zones and management regulations, respectively. Robben Island falls within an Marine Protected Area (MPA), with Critical Biodiversity Area 1 (CBA 1), Critical Biodiversity Area 2 (CBA 2), and Ecological Support Area (ESA) lying adjacent to the boundary of the MPA on the east and north.</p> <p>The Threatened or Protected Species (TOPS) Regulations were promulgated on 1 June 2007 in terms of Section 91(1)(g), (h) and (i) of NEMBA. TOPS aims to further regulate the permit system set out in NEMBA, provide for the prohibition and regulation of restricted activities, and provide for the protection of wild populations of listed and threatened or protected species. The minister published amendments to the TOPS on 29 April 2014, which was updated to include for the regulations and registration of a number of activities</p>

<sup>1</sup> The latest version of National Coastal and Marine Spatial Biodiversity Plan (v1.1 was released in June 2021) (Harris *et al.* 2020). The Plan is intended to be used by managers and decision-makers in those national government departments whose activities occur in the coastal and marine space, e.g., environment, fishing, transport (shipping), petroleum, mining, and others. It is relevant for the Marine Spatial Planning Working Group where many of these departments are participating in developing South Africa’s emerging marine spatial plans. It is also intended for use by relevant managers and decision-makers in the coastal provinces and coastal municipalities, EIA practitioners, organisations working in the coast and ocean, civil society, and the private sector.



**APPLICABLE  
LEGISLATION**

**DESCRIPTION OF LEGISLATION**

	<p>for the capture, farming and handling of threatened or protected species (e.g. captive breeding facilities, sanctuaries, game farms and nurseries).</p>
<p><b>National Environmental Management Protected Areas Act (No. 57 of 2003)</b></p>	<p>The purpose of the National Environmental Management Protected Areas Act (No. 57 of 2003) (NEMPAA) is to, inter alia, provide for the protection and conservation of ecologically viable areas representative of South Africa’s biological diversity and its natural landscapes and seascapes. To this end, it provides for the declaration and management of various types of protected areas.</p> <p>Section 50(5) of NEMPAA states that “<i>no development, construction or farming may be permitted in a nature reserve or world heritage site without the prior written approval of the management authority.</i>” Robben Island is a world heritage site and falls under the management of RIM.</p> <p>The proposed WWTW falls within Robben Island MPA per NEMPAA. The Robben Island MPA is an inshore and offshore conservation region around and near Robben Island. The Regulations for the Management of the Robben Island Marine Protected Area (GNR794) were published on 23 May 2019 in terms of Sections 48A(2) and 86(1)(a), (b), (c) and (d) NEMPAA.</p> <p>SAN Parks is the management authority for the Robben Island MPA and will be consulted during the public participation process.</p>
<p><b>National Environmental Management: Integrated Coastal Management Act (No. 24 of 2008)</b></p>	<p>The National Environmental Management: Integrated Coastal Management Act (NEMICMA) Section 69 states that “<i>no person may discharge effluent that originates from a source on land into coastal waters except in terms of a general authorisation contemplated in subsection (2) or a coastal waters discharge permit (CWDP) issued under this section</i>”. RIM has therefore applied for a CWDP in order to discharge treated effluent into the ocean and is awaiting issuance of the CWDP.</p>
<p><b>National Water Act (No. 36 of 1998)</b></p>	<p>The purpose of the National Water Act (No. 36 of 1998) (NWA) is to provide a framework for the equitable allocation and sustainable management of water resources. Both surface and groundwater sources are national resources, which cannot be owned by any individual, and rights to which are not automatically coupled to land rights, but for which prospective users must apply for authorisation and register as users. The NWA also provides for measures to prevent, control and remedy the pollution of surface and groundwater sources.</p> <p>The Act aims to regulate the use of water and activities (as defined in Part 4, Section 21), which may impact on water resources through the categorisation of ‘listed water uses.’ Defined water use activities require the approval of DWS in the form of a General Authorisation (GA) or Water Use Licence (WUL) authorisation. Obtaining a CWDP in terms of section 69 of NEMICMA replaces the need to obtain a WUL in terms of the Section 21 (f) and (h) of the National Water Act.</p> <p>Section 2 of GN 665 identifies water treatment standards for the discharge of waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit; and disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process. Section 2.7 indicates the need to comply with the General Limit values (GLV) listed for disposal up to 2,000m<sup>3</sup> per day into non-listed water resources. The WWTW has been designed to achieve GLVs as listed in this Act.</p>
<p><b>National Heritage Resources Act (No. 25 of 1999)</b></p>	<p>The National Heritage Resource Act (Act No. 25 of 1999) (NHRA) serves to protect national and provincial heritage resources across South Africa. The NHRA provides for the protection of all archaeological and palaeontological sites, the conservation and care of cemeteries and graves by the South African Heritage Resource Agency (SAHRA), and lists activities which require any person who intends to undertake to notify the responsible heritage resources agency and furnish details regarding the location, nature, and extent of the proposed development.</p>

**APPLICABLE LEGISLATION****DESCRIPTION OF LEGISLATION**

	<p>Robben Island Museum is responsible for managing, maintaining, developing and marketing Robben Island as a National Heritage and World Heritage Site in terms of the National Heritage Resources Act of 1999 and the National World Heritage Act of 1999.</p> <p>Robben Island is a World and National Heritage site and requires a permit from SAHRA to destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of a National Heritage Site. The proposed WWTW would therefore require a permit from SAHRA before construction on site may commence.</p> <p>Construction activities should be conducted carefully, and all activities ceased if any archaeological, cultural and heritage resources are discovered. SAHRA should be notified and an investigation conducted in accordance with the Chance Find Procedure to be established for the Project before any activities can commence.</p>
<b>National Environment Management Air Quality Act (No. 39 of 2004)</b>	<p>The National Environment Management: Air Quality Act (No. 39 of 2004) (NEMAQA) came into effect on 11 September 2005. Persons undertaking such activities listed under GNR 893, as amended, are required to possess an Atmospheric Emissions License (AEL).</p> <p>The National Dust Control Regulations (GNR 827) were promulgated in terms of Section 32 of NEMAQA, which aim at prescribing general measures for the control of dust in both residential and non-residential areas.</p> <p>Although no AEL will be required for the construction and operation of the WWTW, the dust control regulations will be applicable during construction.</p>
<b>Civil Aviation Act (No. 13 of 2009)</b>	<p>Civil aviation in South Africa is governed by the Civil Aviation Act (Act 13 of 2009). This Act provides for the establishment of a stand-alone authority mandated with controlling, promoting, regulating, supporting, developing, enforcing and continuously improving levels of safety and security throughout the civil aviation industry. This mandate is fulfilled by SACAA as an agency of the Department of Transport (DoT). SACAA achieves the objectives set out in the Act by complying with the Standards and Recommended Practices (SARPs) of the International Civil Aviation Organisation (ICAO), while considering the local context when issuing the South African Civil Aviation Regulations. All proposed developments or activities in South Africa that potentially could affect civil aviation must thus be assessed by SACAA in terms of the Civil Aviation Regulations and South African Civil Aviation Technical Standards (SA CATS) to ensure aviation safety. Potential impacts from the power lines must be reviewed by these authorities.</p> <p>The Obstacle Evaluation Committee (OEC) which consists of members from both the SACAA and South African Air Force (SAAF) fulfils the role of streamlining and coordinating the assessment and approvals of proposed developments or activities that have the potential to affect civil aviation, military aviation, or military areas of interest.</p> <p>The Robben Island Airstrip is located approximately 1 km north west of the proposed WWTW. The DEA Screening Tool Report identified Civil Aviation as having medium sensitivity for the proposed WWTW. SACAA and Air Traffic Navigation Services (ATNS) will be included in the public participation process.</p>
<b>Occupational Health and Safety Act (No. 85 of 1993)</b>	<p>The National Occupational Health and Safety Act (No. 85 of 1993) (OHSA) and the relevant regulations under the Act are applicable to the proposed project. This includes the Construction Regulations promulgated in 2014 under Section 43 of the Act. Adherence to South Africa's OHSA and its relevant Regulations is essential.</p>

**Table 2-2: Applicable Policies****APPLICABLE POLICY DESCRIPTION OF POLICY**

<b>National Development Plan</b>	<p>The National Development Plan (NDP) aims to eliminate poverty and reduce inequality by 2030. The main objectives to achieve this aim are categorised as follows:</p>
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**APPLICABLE POLICY****DESCRIPTION OF POLICY**

	<ul style="list-style-type: none"> <li>— Economy and Employment</li> <li>— Economic infrastructure</li> <li>— Environmental sustainability and resilience</li> <li>— Inclusive rural economy</li> <li>— South Africa in the region and the world</li> <li>— Transforming Human Settlements</li> <li>— Improving education, training and innovation</li> <li>— Health care for all</li> <li>— Social protection</li> <li>— Building Safer Communities</li> <li>— Building a capable and developmental state</li> <li>— Fighting corruption</li> <li>— Nation building and social cohesion</li> </ul> <p>Under “Economic Infrastructure”, the NDP identifies “improving infrastructure” as an imperative for South Africa in the coming decade. It recognises that “infrastructure is not just essential for faster economic growth and higher employment. It also promotes inclusive growth, providing citizens with the means to improve their own lives and boost their incomes. Infrastructure is essential to development.”</p> <p>The development of the proposed WWTW will contribute, indirectly, towards the National Development Goal of Improving education, training and innovation. Furthermore, the tourism and culture sector is highlighted as one of a number of key drivers for change in the NDP. The total contribution of tourism activity to South Africa's gross value added was estimated at over 9% in 2008. Culture, the arts and other parts of the creative economy have the potential to generate employment and export earnings. As one of South Africa’s nine UNESCO World Heritage Sites, the island is one of South Africa’s leading tourism destinations and the contribution of Robben Island to the national Economy is likely to be significant.</p>
<b>New Growth Path</b>	<p>Government released the New Economic Growth Path Framework on 23 November 2010. The aim of the framework is to enhance growth, employment creation and equity. The policy’s principal target is to create five million jobs over the next 10 years and reflects government’s commitment to prioritising employment creation in all economic policies. The framework identifies strategies that will enable South Africa to grow in a more equitable and inclusive manner while attaining South Africa’s developmental agenda. Central to the New Growth Path is a massive investment in infrastructure as a critical driver of jobs across the economy. In this regard the framework identifies investments in five key areas namely: energy, transport, communication, water and housing.</p> <p>The WWTW will provide a limited number of jobs during construction. The WWTW is required by the small population of Robben Island and visitors in order to be able to treat sewage to the required water quality standards as defined by NEMICMA. It is therefore deemed a social priority in that it provides the necessary sanitation and will lead to an overall improvement in the discharge quality from the island.</p>
<b>National Infrastructure Plan</b>	<p>The South African Government adopted a National Infrastructure Plan (NIP) in 2012. The NIP aims to transform the South African economic landscape while simultaneously creating significant numbers of new jobs and strengthening the delivery of basic services. It outlines the challenges and enablers which needs to be addressed in the building and developing of infrastructure. The Presidential Infrastructure Coordinating Commission (PICC) was established by the Cabinet to integrate and coordinate the long-term infrastructure build.</p> <p>The WWTW will provide a limited number of jobs during construction and will improve the delivery of basic services.</p>

**APPLICABLE POLICY**

**DESCRIPTION OF POLICY**

**African Penguin Biodiversity Management Plan (GN 824 of 31 October 2013)**

The aim of the African Penguin Biodiversity Management Plan is “to halt the decline of the African Penguin population in South Africa within two years of the implementation of the management plan and thereafter achieve a population growth which will result in a down listing of the species in terms of its status in the IUCN Red List of Threatened Species.” The plan details threats to the African Penguin population and sets out an action plan to mitigate potential impacts and threats to African Penguins.

During construction and operation of the WWTW, RIM must consult the African Penguin Biodiversity Management Plan in order to carefully manage and avoid further harmful disturbance to African Penguins.

# 3 PROJECT DESCRIPTION

## 3.1 LOCATION OF THE PROPOSED PROJECT

The site is located on Robben Island which is a World and National Heritage Site. Robben Island is situated in Table Bay, approximately 10 km north of the V&A Waterfront in Cape Town. The island covers an area of 5.18 km<sup>2</sup> and is relatively flat, only a few meters above sea level. The proposed WWTW falls within Ward 54 of the City of Cape Town Municipality, which is located in the Western Cape Province. The SG Digit Code is C01600000000143600000.

The proposed WWTW is located on the eastern side of Robben Island. The project site is bounded to the northeast by Murray's Bay beach (80 m), to the north by the Dog Unit (Robert Sobukwe Complex) (30 m), to the west by Murray's Road (50 m) and to the south by the Robben Island village (400 m) and nearby sensitive ecosystems. The land is not currently used for any purpose and is a vacant piece of land.

**Table 3-1** below provides the corner co-ordinates of the proposed WWTW infrastructure.

**Table 3-1: Co-ordinates of corner points of the WWTW**

### CORNER

<b>NW corner</b>	33°48'15.98"S	18°22'35.84"E
<b>NE corner</b>	33°48'15.63"S	18°22'36.44"E
<b>SE corner</b>	33°48'17.04"S	18°22'37.81"E
<b>SW corner</b>	33°48'17.47"S	18°22'37.20"E

A pipeline already exists from the WWTW to the marine outfall. Therefore, the construction of a pipeline is not part of the development application. Location points A, B and C of the existing pipeline shown below (**Table 3-2**), are reflected on **Figure 3-1**.

**Table 3-2: Co-ordinates of the existing pipeline**

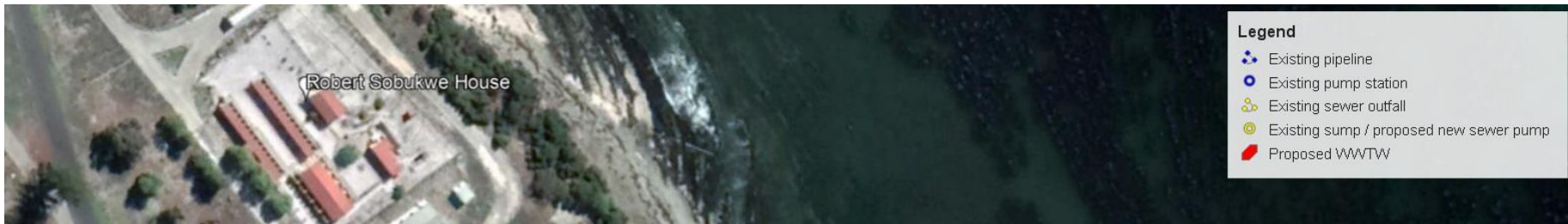
PIPELINE	LATITUDE	LONGITUDE
Starting Point (A)	33°48'14.83"S	18°22'37.68"E
Middle (B)	33°48'17.87"S	18°22'40.33"E
End (C)	33°48'20.08"S	18°22'43.35"E

**Figure 3-1** and **Figure 3-2** below indicate the layout of the proposed WWTW infrastructure.






A

B

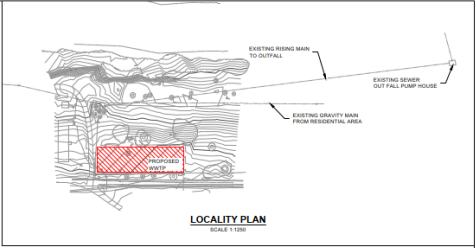
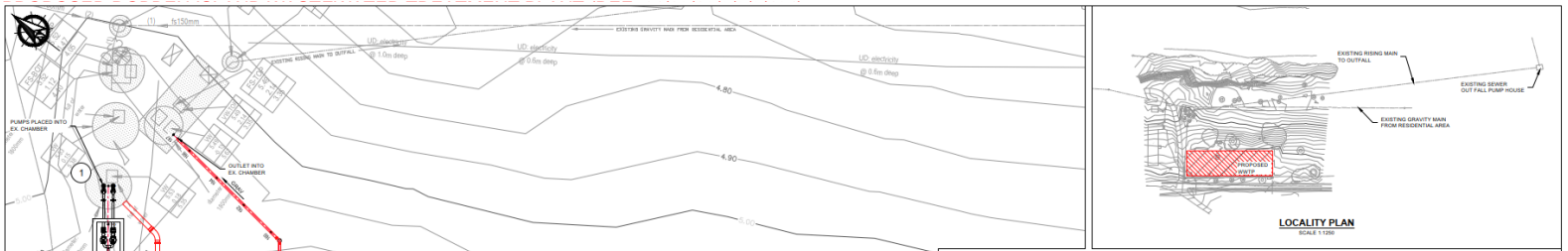
C



**Legend**

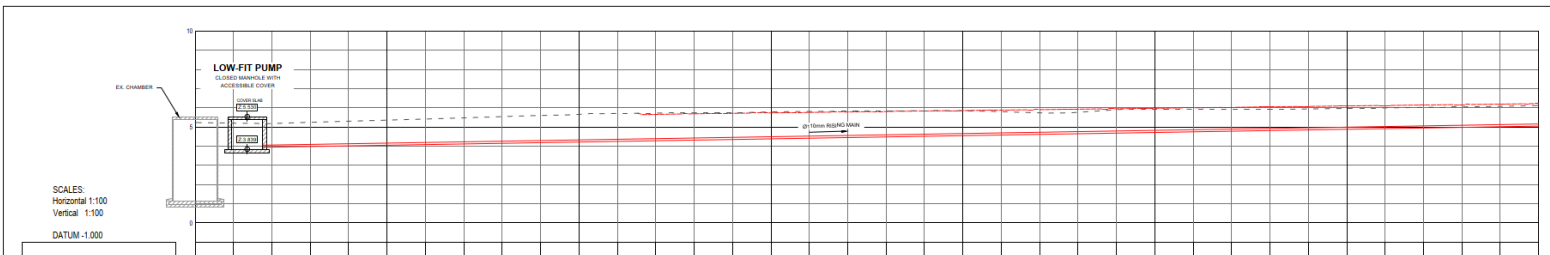
-  Existing pipeline
-  Existing pump station
-  Existing sewer outfall
-  Existing sump / proposed new sewer pump
-  Proposed WWTW

**Figure 3-1: Layout of the WWTW and existing sewer outfall**





**Figure 3-2: Layout of the Proposed WWTW infrastructure**



**Figure 3-3: Cross-section of the Proposed WWTW Infrastructure**

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## 3.2 PROJECT INFRASTRUCTURE

Element Consulting Engineers (ECE) were appointed on 26 February 2020 by RIM to design and implement the proposed Wastewater Treatment Plant. A Design Report was prepared by ECE in March 2021.

As indicated above, an IEA was secured for the proposed infrastructure in 2015 (DFFE Ref: 14/12/16/3/3/3/83). The details of the WWTW described within the EA were for a WWTW with a treatment capacity of 108,000 m<sup>3</sup> per annum with all the effluent generated on the island discharged via a marine outfall into the coastal environment after treatment. The design allowed for a maximum discharge volume of 300m<sup>3</sup> per day. ECE have amended the design with the following key changes:

- The daily throughput capacity has been decreased from 300m<sup>3</sup> a day to 200m<sup>3</sup> a day. However, the plant is scalable, which means that additional units can be added to increase the capacity of the plant, if required in future. The current application for IEA is therefore for approval of a WWTW with a throughput capacity of 300m<sup>3</sup> per day to accommodate for a potential future scenario.
- Phosphate removal is no longer incorporated at the Robben Island WWTW. Phosphate removal is generally not considered necessary when general limits must be achieved.
- The location of the land-based WWTW infrastructure has been moved further inland (westwards), resulting in a smaller overall footprint of 1070m<sup>2</sup>.
- The facility is no longer fully enclosed in a box and submerged. Certain components of the WWTW will be covered and the facility will be above ground.

**Figure 3-4** below provides an illustrative example of the proposed WWTW infrastructure and **Figure 3-5** shows a 3D rendering of the proposed WWTW on Robben Island.



**Figure 3-4: Typical example of WWTW**



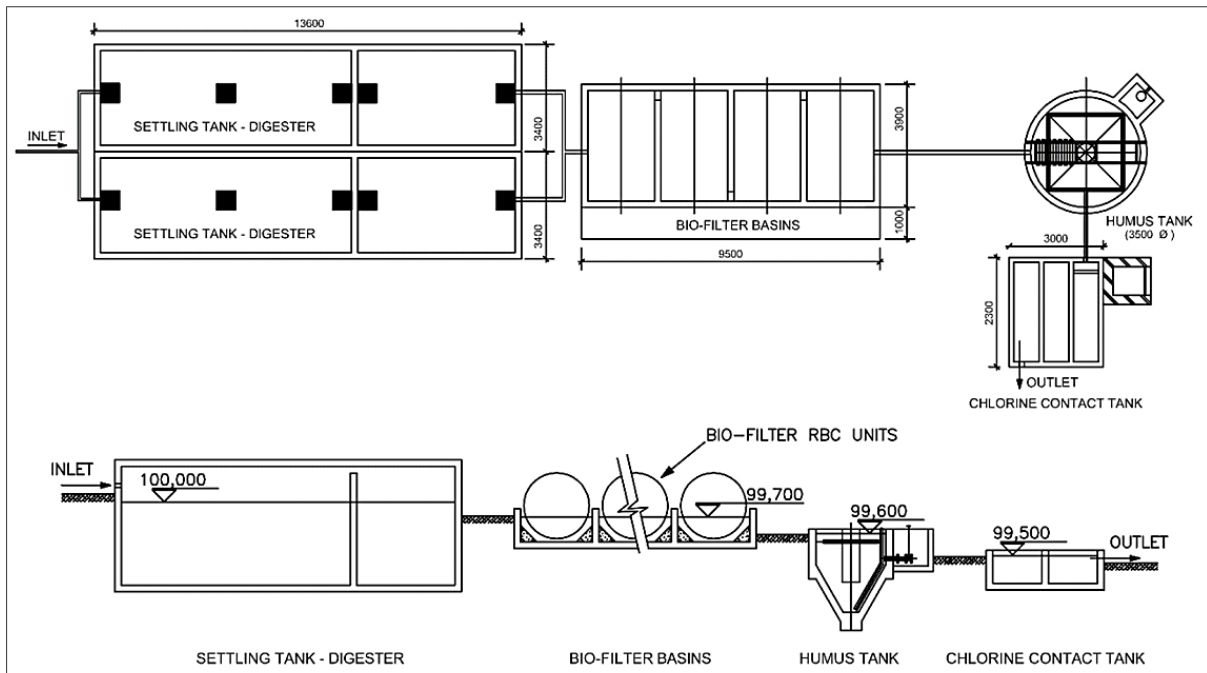
**Figure 3-5: 3D rendering of the proposed WWTW for Robben Island**

The following section is extracted from the Design Report (March 2021) prepared by ECE and describes the primary components of the proposed WWTW infrastructure.

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### **3.2.1 INLET STRUCTURE**

Raw sewage will flow through a simple civil concrete inlet structure upstream of the primary settling tank with a hand rake screen which provides a facility to remove non-organic objects from the sewage (**Figure 3-6**). The screen must be cleaned daily with a rake and the screenings disposed of in a solid waste bin. Any grit entering the WWTW will settle in this primary settling tank and be removed with the settled sludge.



**Figure 3-6: Schematic layout of the proposed WWTW**

### 3.2.2 PRIMARY SETTLING TANK (ANAEROBIC AND ANOXIC REACTOR)

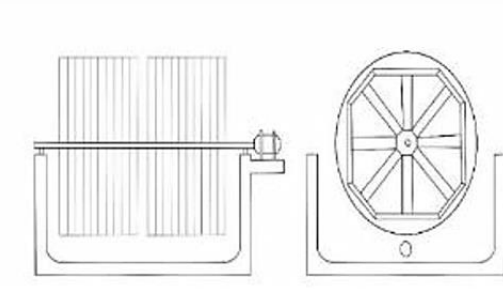
After screening, raw sewage will flow into a septic tank. The capacity of the septic tank should allow for at least 24 hours retention of the Average Wet Weather Flow (AWWF). Therefore, a capacity of 200 kl will be provided. The septic tank will make provision for the accumulation of settled material and has design features incorporated to ensure that this activity does not cause unnecessary blockages across the tank.

The septic tank will comprise two chambers:

- Anaerobic Primary Settler- oxidation and gross removal of organic material by settlement.
- Anoxic second settler- allows for de-nitrification to take place during which nitrogen is removed and the organic material is further reduced.

### 3.2.3 ROTATING BIOLOGICAL CONTACTORS (AEROBIC REACTOR)

From the septic tank, the sewage will gravitate to the Rotating Biological Contactors (RBCs) within the aerobic reactor where further organic reduction and ammonia nitrification is achieved under aerobic conditions (**Figure 3-7**). The aerobic conditions are achieved by the rotation of discs, on which the micro-organism are attached and growing, at a low speed of approximately 3 to 4 RPM. There will be six rotors, each capable of treating 30 kl of domestic sewage per day.

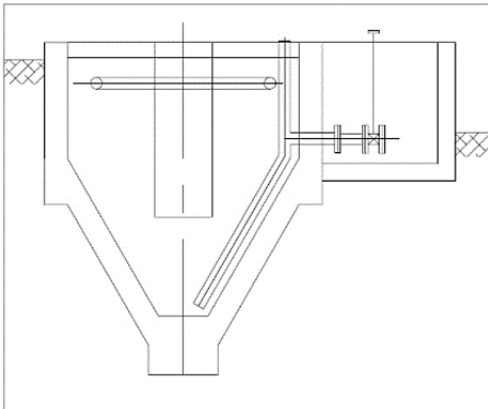


**Figure 3-7: Illustrative representation of Rotating Biological Contactors**

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### 3.2.4 SECONDARY SETTLING TANK (HUMUS TANK)

From the RBC, sewage will gravitate to the secondary settling tank or humus tank (**Figure 3-8**) where settleable sludge will be removed under gravity to a sludge sump from where it will be recycled with a de-sludge pump to the first chamber of the septic tank for anaerobic digestion. Phosphate removal will not be incorporated at the Robben Island WWTW.



**Figure 3-8: Cross Section of the Humus Tank**

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### 3.2.5 DISINFECTION

The effluent from the secondary settling tank will gravitate to the chlorine contact channel where it will be dosed with a disinfectant. This will be done by means of a pod system and dosing by means of chlorine tablets. The chlorination contact channel will be sized to ensure at least 30 minutes contact time between the effluent and the disinfectant at the AWWF.

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### 3.2.6 RISING MAIN FOR FINAL EFFLUENT REUSE

Intermittently flushing of the sewer pipelines is required to clean pipelines to prevent clogging due to low sewage flow condition. The proposal is to flush the pipelines with water that is abstracted from the WWTW or the pump station sump to sea and to use this to flush the system where required by means of a tanker.

Treated effluent will gravitate to the existing sewage collector sump at the proposed WWTW site from where it will be pumped along the existing outfall sewer pipeline to discharge through a diffuser 465 m offshore. The proposed WWTW will deliver treated effluent that conforms to the DWA general wastewater limit values, as shown in **Table 3-3**, to enable release into the environment. Table 3.3 has been amended to correctly reflect the Wastewater limit values applicable to discharge of wastewater into a water resource, as per GN 665, September

2013, Revision of General Authorisations in terms of Section 39 of the National Water Act, 1998 (Act no. 36 of 1998).

**Table 3-3: Limits of Determinates in Discharged Effluent**

<b>SUBSTANCE / PARAMETER</b>	<b>LIMIT</b>
<b>Faecal Coliforms (per 100 ml)</b>	<u>1000</u>
<b>Chemical Oxygen Demand (mg/l)</b>	<u>75</u>
<b>PH</b>	<u>5.5-9.5</u>
<b>Ammonia (ionized and un-ionized) as Nitrogen (mg/l)</b>	<u>6</u>
<b>Nitrate/Nitrite as Nitrogen (mg/l)</b>	<u>15</u>
<b>Chloride as Free Chloride (mg/l)</b>	<u>0.25</u>
<b>Suspended Solids (mg/l)</b>	<u>25</u>
<b>Electrical Conductivity (mS/m)</b>	<u>70 above intake</u>
<b>Orthophosphate as phosphorous (mg/l)</b>	<u>10</u>
<b>Fluoride (mg/l)</b>	<u>1</u>
<b>Soap, oil or grease (mg/l)</b>	<u>2.5</u>
<b>Dissolved Arsenic (mg/l)</b>	<u>0.02</u>
<b>Dissolved Cadmium (mg/l)</b>	<u>0.005</u>
<b>Dissolved Chromium (VI) (mg/l)</b>	<u>0.05</u>
<b>Dissolved Copper (mg/l)</b>	<u>0.01</u>
<b>Dissolved Cyanide (mg/l)</b>	<u>0.02</u>
<b>Dissolved Iron (mg/l)</b>	<u>0.3</u>
<b>Dissolved Lead (mg/l)</b>	<u>0.01</u>
<b>Dissolved Manganese (mg/l)</b>	<u>0.1</u>
<b>Mercury and its compounds (mg/l)</b>	<u>0.005</u>
<b>Dissolved Selenium (mg/l)</b>	<u>0.02</u>
<b>Dissolved Zinc (mg/l)</b>	<u>0.1</u>
<b>Boron (mg/l)</b>	<u>1</u>



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### 3.2.7 SLUDGE MANAGEMENT

Surplus matter (i.e. settled sludge) will be processed through a sludge management system (as required). It is anticipated that the WWTW will generate approximately 66 m<sup>3</sup> of settled sludge annually, 70% of which will be water. The system will include drying beds for sun and wind assisted sludge drying. For this purpose, the beds must remain uncovered; however, netting will be placed over the drying beds to prevent the ingress of birdlife.

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## 3.3 PROCESS FLOW

Figure 3-9 below provides a process flow diagram of the proposed WWTW.

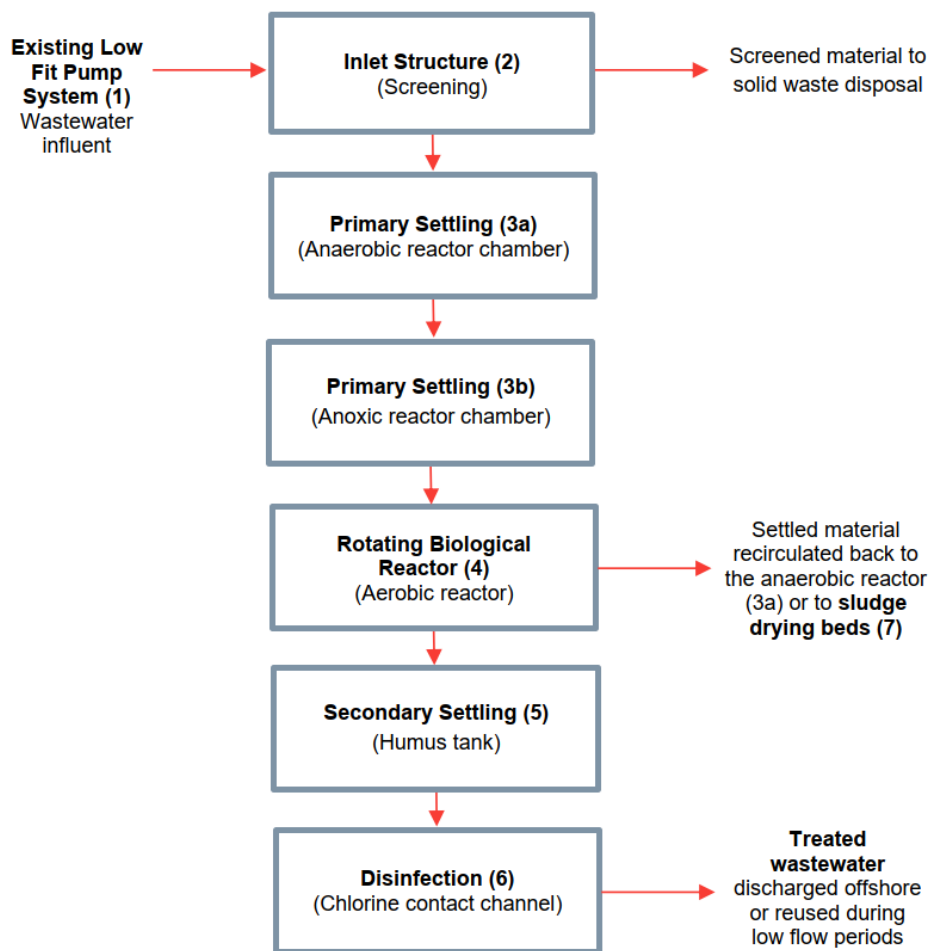


Figure 3-9: Process Flow for the Proposed WWTW

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## 3.4 PROPOSED PROJECT DEVELOPMENT ACTIVITIES

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### 3.4.1 CONSTRUCTION PHASE

#### CONSTRUCTION SCHEDULE

Construction is anticipated to take 6 months from appointment of a contractor. The construction period includes excavation, concrete works, assembly, backfilling and finishing.

#### LABOUR REQUIREMENTS

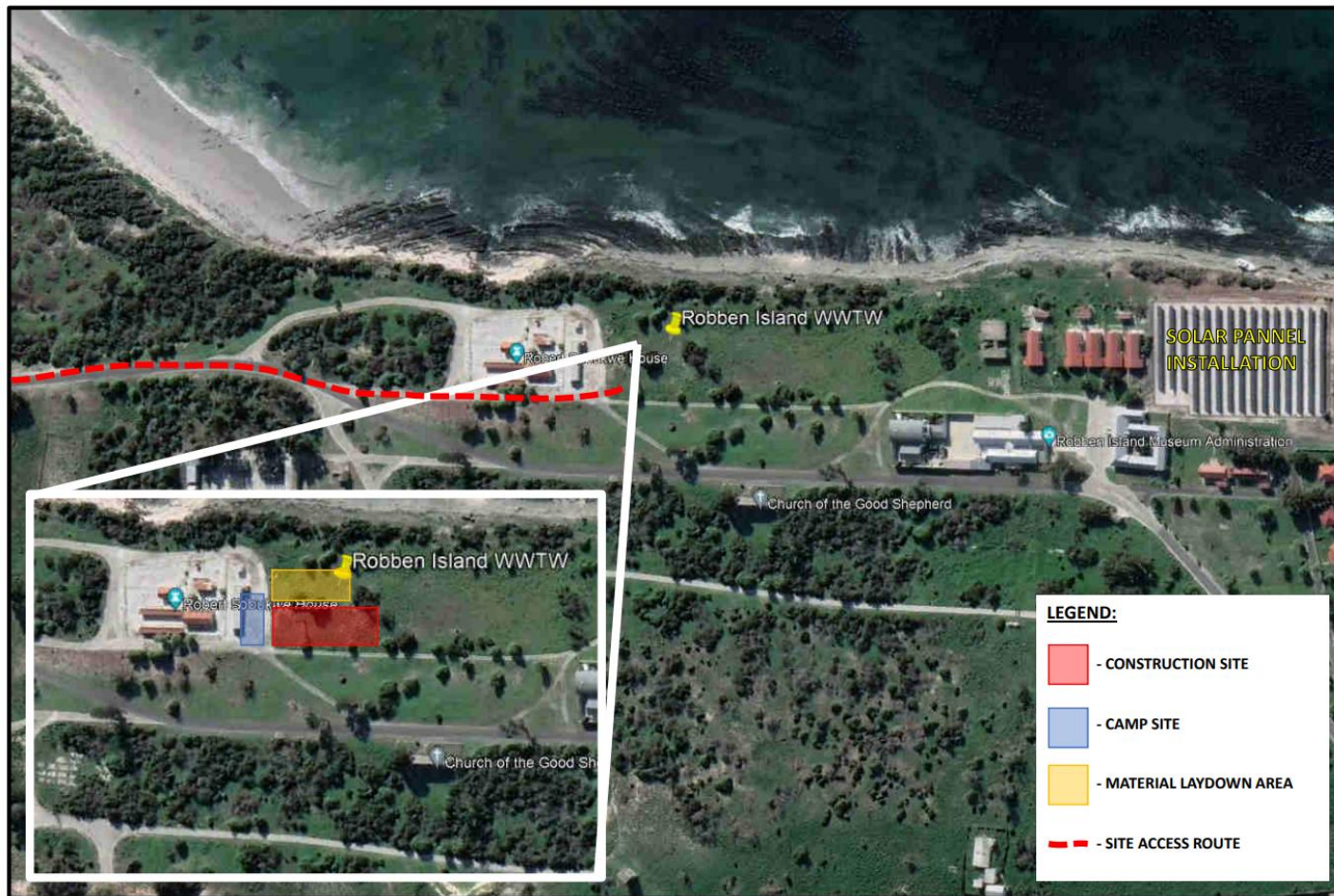
During site preparation and installation of Project related infrastructure, the selected Contractor, working on behalf of Robben Island, is anticipated to require 20-30 people to undertake the required works. Approximately 5% of workers would be highly skilled, 15% medium skilled, and 80% low skilled.

#### SITE ESTABLISHMENT AND TRANSPORTATION OF MATERIALS AND EQUIPMENT TO SITE

The selected Contractor will establish a temporary site camp including, but not be limited to laydown areas for equipment and materials, storage facilities, ablutions and waste storage and handling area (**Figure 3-10**). The location and extent of the Contractors camp, to be established within the Project area, will be undertaken in line with specifications detailed within the EMPr. Temporary fencing will be established around the construction site and material storage area.

Plant equipment and materials required will be transported to the island via boat and transported via the main access road to the construction camp. Materials will be transported prior to the start of construction and will include, inter alia, concrete sand, crushed concrete stone, cement, pre-fabricated modular units of package plant, pipes and fittings and shutter boards for concrete pouring.

Construction waste will be stored on site in a designated and demarcated area within appropriate receptacles. The construction solid waste will be delivered to the mainland via means of a boat together with other domestic waste produced on the island and then delivered to an appropriately licenced general landfill facility. Hazardous waste will be delivered to a licensed hazardous landfill facility.



	<b>ROBBEN ISLAND WWTW - SITE LOCALITY AND CAMP SITE LAYOUT</b>	<b>06 SEP 2022</b>
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**Figure 3-10: Site Locality Map and Construction Camp Layout**

## VEGETATION CLEARING

Due to the nature of the vegetation within the Project area, which is predominantly low bushes and grass, limited vegetation clearing will be required. Clearing of vegetation will be limited to the WWTW footprint area.

## EXCAVATIONS

The WWTW will have some components that will be partially submerged and excavations will therefore be required. Excavations will vary from 3 to 5m deep across the footprint of the WWTW to ensure that there is a gravity feed from the south to the north of the plant. Approximately 450 to 500m<sup>3</sup> of excavated material (spoil) will be generated as a result of excavations. Excavated material will be used to create a planted earth mound/berm along the western perimeter of the development envelope. This mound will be organically designed to resemble a natural topographic feature ('dune shaped') (See **Section 9.1.6** for more detail).

## INSTALLATION OF WASTEWATER TREATMENT PLANT

The installation of the WWTW will entail the assembling of modular units of the plant and securing these to a concrete floor, installation of the internal pipe reticulations and fittings and backfilling around the WWTW to the required level using excavated material. Trenches will also be required to be excavated for all subsurface pipework, including the effluent pipe from inlet sump to plant, the pipe carrying treated effluent from plant to outfall pump sump, the pipe carrying sludge from plant to drying beds and the pipe carrying seepage from the drying beds to the inlet sump.

The pipeline to the existing outfall will not be replaced/constructed. The temporary fencing will be dismantled once construction of the WWTW is complete and a permanent perimeter "penguin proof" security fence will be erected around the WWTW infrastructure.

## DEMOBILISATION

Upon completion of the installation phase, any temporary infrastructure will be removed, and the affected areas rehabilitated.

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### 3.4.2 OPERATIONAL PHASE

RIM will be responsible for managing the operations of the WWTW.

## WASTE MANAGEMENT

Some solid waste will be generated at the inlet from the hand rake screen which serves the purpose of retaining non-organic solid material which enters the effluent stream. This will be removed from the island and taken to a licensed hazardous landfill site.

Additionally, as a by-product of the process, an estimated 66m<sup>3</sup> of sludge will be generated annually, approximately 70% of which will be water. The sludge will be inert as a result of the bacteriological breakdown that occurs during extended biological breakdown within the chambers. This means that the sludge will be a "spent" by-product with no metabolic activity. Sludge will be transferred to a drying bed located directly adjacent to the facility for sun and wind assisted sludge drying. For this purpose, the beds must remain uncovered; however, netting will be placed over the drying beds to prevent the ingress of birdlife.

According to the Sewage/Sludge Status Quo Report (2020/21) produced by the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP), the waste from the drying bed will be able to be used as fertiliser. However, this will need to be confirmed through appropriate testing before the sludge can be used as fertiliser.

According to section 4(2) of GN R.634 of 2013 (DEA(a), 2013), all waste generators must ensure that their waste is classified in accordance with SANS 10234 (based on the Global Harmonised System) within 180 days of generation, except if it is listed in Annexure 1 (Wastes that do not require Classification and Assessment) of GNR 634. Furthermore, waste must be re-classified every 5 years.

Once the WWTW is operational, RIM will be responsible for ensuring that the sludge is tested (within 180 days) to ensure that the content of heavy metals is within acceptable limits in line with the Sewage/Sludge Status Quo Report (2020/21). If the results of the testing confirm that the sludge is suitable to be used as fertiliser as is anticipated, then a maximum of 10m<sup>3</sup> of dried sludge per year will be spread out over an area adjacent to the WWTW, 15 or 20 mm thick, depending how wide it is spread or throughout the island as required.

Should the results of the testing indicate that the sludge is not suitable to be used as fertiliser, then the sludge will be disposed of appropriately at a licensed landfill site or to a municipal WWTW off the island.

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### 3.4.3 DECOMMISSIONING PHASE

Decommissioning will be considered when the WWTW is regarded obsolete and will be subject to a separate authorisation and impact assessment process. This is not expected to occur in the near future.

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## 3.5 SITE ACCESS AND SERVICES

Access to the proposed site is available via the existing Murrays Bay Road. Small volumes of water will be required for the WWTW, which will be sourced from the existing water supplied by the island's desalination plant. There is an existing electrical supply and sewer connection. The proposed WWTW is designed to maximise potential for gravity flow of sewage from the various ablution facilities around the operational area that are to be reticulated to the WWTW, to minimise pumping energy demand. Aeration blowers and pumps are efficient low energy demand installations.

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## 3.6 NEED AND DESIRABILITY OF THE PROJECT

The DEA&DP Guideline (2013) states that the essential aim of need and desirability is to determine the suitability (i.e. is the activity proposed in the right location for the suggested land-use/activity) and timing (i.e. is it the right time to develop a given activity) of the development. Therefore, need and desirability addresses whether the development is being proposed at the right time and in the right place. Similarly, the 'Best Practicable Environmental Option' (BPEO) as defined in NEMA is "*the option that provides the most benefit and causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term.*"

There is currently no formal WWTW on Robben Island. All sewage is pumped by six pump stations to a collection sump near Robert Sobukwe's former residence, where it is macerated and pumped along the outfall sewer pipeline to discharge through a diffuser 465 m offshore.

The site is located on Robben Island which is a National and World Heritage Site. In order for the island to continue to be utilised as an educational and cultural heritage resource, it is vital that the proposed WWTW is constructed given that the current infrastructure is operating inefficiently and is resulting in unacceptable water quality impacts.

In 2004, the impacts of the marine sewer outfall were recognised as one of the threats to the Robben Island World Heritage site, which if not adequately managed or controlled could adversely impact on the integrity of the area.<sup>2</sup> A competent sewage management service will mitigate and minimise environmental and human health risks posed by untreated sewage discharges. The approval of the WWTW would not compromise the integrity of the existing environmental management priorities of the island. The WWTW is to be located on an already highly degraded portion of the island. Once constructed, the activity is not expected to have any long-term negative impacts on the environment. In fact, an overall improvement in the offshore marine environment can be expected as a result of this project.

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<sup>2</sup> <http://whc.unesco.org/en/soc/1432>

The population of Robben Island is around 116 persons. The majority of people visiting the island are tourists and school groups. The WWTW is required by the small population of Robben Island and visitors in order to be able to treat sewage to required water quality standards as defined by NEMICMA. It is therefore deemed a social priority in that it provides the necessary sanitation and will lead to an overall improvement in the discharge quality from the island.

The land on which the WWTW will be constructed is considered suitable and in line with the land use required as it is in close proximity to the existing sea outfall and pump stations and sewer influent collection pump, it is located away from sensitive areas on the island e.g. quarries, prison, tourist congregation areas/ walkways, harbour and there is existing road access and service availability. No physical or economic displacement will be required.

The proposed WWTW is supported by prevailing policies and plans (refer to **Section 2**). Furthermore, negative environmental impacts associated with the activity will be mitigated to acceptable levels in accordance with the EMPr.



## 4 IMPACT ASSESSMENT

A summary of the identified impacts and corresponding significance ratings for the proposed WWTW is provided in **Table 4-1** below.

**Table 4-1: Impact Summary**

REF.	IMPACT DESCRIPTION	PHASE	WITHOUT MITIGATION		WITH MITIGATION	
			SIGNIFICANCE	STATUS	SIGNIFICANCE	STATUS
Air Quality	Generation of Dust and PM	Construction	Low	(-)	Low	(-)
	Odour	Operation	Low	(-)	Low	(-)
Noise	Noise Emissions	Construction	Low	(-)	Low	(-)
	Noise Emissions	Operation	Low	(-)	Low	(-)
Soil Erosion & Contamination	Soil Erosion	Construction	Low	(-)	Low	(-)
	Soil Contamination	Construction	Low	(-)	Low	(-)
	Soil Contamination	Operation	Low	(-)	Low	(-)
Groundwater	Deterioration of Groundwater Quality	Construction	Moderate	(-)	Low	(-)
	Deterioration of Groundwater Quality	Operation	Moderate	(-)	Low	(-)
Biodiversity	Destruction of Vegetation	Construction	Low	(-)	Low	(-)
	Destruction of Vegetation	Operation	Low	(-)	Low	(-)
Avifauna	Disturbance of Nesting Sites	Construction	Low	(-)	Low	(-)
	Obstruction of Penguin Highways	Construction	Low	(-)	Low	(-)
	Disturbance of Sea Birds	Operation	Low	(-)	Low	(-)
Marine Environment	Decreased Plankton Blooms	Operation	Moderate	(+)	Moderate	(+)

REF.	IMPACT DESCRIPTION	PHASE	WITHOUT MITIGATION		WITH MITIGATION	
			SIGNIFICANCE	STATUS	SIGNIFICANCE	STATUS
	Recovery of Biodiversity	Operation	Moderate	(+)	Moderate	(+)
	Recovery of the Structure and Diversity of Soft-Sediment Macrofauna	Operation	Moderate	(+)	Moderate	(+)
	Improved Sediment Quality	Operation	Moderate	(+)	Moderate	(+)
	Modification of the Diversity, Abundance and Structure of Fish Assemblages	Operation	Moderate	(+)	Moderate	(+)
	Improved Environmental Health	Operation	Moderate	(+)	Moderate	(+)
	Bioaccumulation of Xenobiotic Substances	Operation	Low	(-)	Low	(-)
	Damage to Marine Biota	Operation	Low	(-)	Low	(-)
	Reduced Salinities	Operation	Low	(-)	Low	(-)
Visual	Visual Disturbance	Construction	Low	(-)	Low	(-)
	Sensitive Visual Receptors	Operation	Moderate	(-)	Low	(-)
	Visual Character and Sense of Place	Operation	Moderate	(-)	Low	(-)
Waste	Improper Waste Management	Construction	Moderate	(-)	Low	(-)
	Improper Waste Management	Operation	Moderate	(-)	Low	(-)
Geotechnical	Geological Faulting	Construction	Low	(-)	Low	(-)



REF.	IMPACT DESCRIPTION	PHASE	WITHOUT MITIGATION		WITH MITIGATION	
			SIGNIFICANCE	STATUS	SIGNIFICANCE	STATUS
	Geological Faulting	Operation	Low	(-)	Low	(-)
Heritage	Damage to Heritage Resources	Construction	Low	(-)	Low	(-)
Socio-economic	Creation of Employment and Skills Development	Construction	Low	(+)	Low	(+)
	Presence of Construction Workers and Impact on Family Structures and Social Networks	Construction	Low	(-)	Low	(-)
	Provision of Essential Services	Operation	Low	(+)	Low	(+)
Health and Safety	Employee Health & Safety	Construction	Moderate	(-)	Low	(-)
	Employee Health & Safety	Operation	Low	(-)	Low	(-)

# 5 ENVIRONMENTAL MANAGEMENT OBJECTIVES

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## 5.1 EMPr OBJECTIVES

The EMPr has the following objectives:

- Encourage good management practices through planning and commitment to environmental issues;
- Minimise disturbance of the natural environment;
- Prevent or minimise all forms of pollution;
- Prevent water wastage;
- Promote the prevention, reduction, reuse, recycling and recovery of waste and develop waste management practices based on prevention, minimisation, recycling, treatment or disposal of waste;
- Adopt the best practical means available to prevent or minimise adverse environmental impacts;
- Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment;
- Describe all monitoring procedures required to identify impacts on the environment; and
- Train onsite personnel with regard to their environmental obligations.

*Please note: This EMPr is a working document and therefore subject to change depending on the requirements of the various Project phases. When applicable, these changes are to be approved in accordance with legislative requirements.*

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## 5.2 ENVIRONMENTAL OBJECTIVES

To facilitate compliance to the EMPr, RIM must comply with all relevant legislation and standards and make all personnel aware of the requirements of the EMPr, as well as the prescribed penalties should a non-conformance be identified during the different phases of the proposed Project.

The environmental objectives include:

- Encourage good management practices through planning and commitment to environmental issues; and
- Provide rational and practical environmental guidelines to:
  - Minimise disturbance of the natural environment;
  - Minimise fugitive emissions;
  - Minimise impact of added traffic into the area;
  - Ensure surface and groundwater resource protection;
  - Prevent or minimise all forms of pollution;
  - Protect indigenous flora and fauna;
  - Prevent soil erosion;
  - Promote sustainable use of resources;
  - Adopt the best practical means available to prevent or minimise adverse environmental impacts;
  - Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment;
  - Promote the reduction, reuse, recycling and recovery of waste;
  - Develop waste management practices based on prevention, minimisation, recycling, treatment or disposal of waste;

- Describe all monitoring procedures required to identify impacts on the environment;
- Define how the management of the environment is reported and performance evaluated; and
- Train onsite personnel with regard to their environmental obligations.

# 6 MANAGEMENT PROCEDURES AND ADMINISTRATIVE REQUIREMENTS

## 6.1 ORGANISATIONAL STRUCTURE AND RESPONSIBILITIES

Formal responsibilities are necessary to ensure that key management measures/procedures are executed. Specific responsibilities of the Project Manager, Site Manager and Environmental Control Officer (ECO) are as defined in **Table 6-1**.

**Table 6-1: Roles and Responsibilities**

RESPONSIBLE PERSON	RESPONSIBILITIES
The Project Proponent / Project Manager ( <u>RIM</u> )	<ul style="list-style-type: none"> <li>— Ensure that the Site Manager and the contractor are aware of all specifications, legal constraints, standards and procedures pertaining to the proposed development specifically with regards to environmental and social aspects;</li> <li>— Ensure that all conditions of the EA and EMPr are communicated and adhered to by the Site Manager and its contractor(s);</li> <li>— Employ an independent ECO to monitor the implementation of the EA conditions and the EMPr commitments throughout the proposed development by means of, but not limited to, site inspections and meetings. This should be documented as part of the onsite implementation records; and</li> <li>— Be fully conversant with the BA Report for the Proposed Project, the conditions of the licenses and authorisations and of the EMPr and ensure compliance thereto.</li> </ul>
Site Manager – Main Contractor	<ul style="list-style-type: none"> <li>— Be fully conversant with the BA Report, the conditions of the EA and of the EMPr and ensure compliance thereto;</li> <li>— Develop relevant method statements;</li> <li>— Provide support to the ECO;</li> <li>— Be fully conversant with all relevant environmental legislation and relevant environmental policies and procedures, and ensure compliance thereto;</li> <li>— Have overall responsibility for the implementation of the conditions of the authorisations and the EMPr;</li> <li>— Ensure that weekly audits/inspections are conducted to ensure/assess compliance with the conditions of the authorisations and the EMPr;</li> <li>— Liaise with the Project Manager or his delegate, the ECO and others on matters concerning the environment;</li> <li>— Prevent actions that will harm or may cause harm to the environment, and take steps to prevent pollution and unnecessary degradation onsite;</li> <li>— Confine project activities to demarcated areas; and</li> <li>— Maintain the following:               <ul style="list-style-type: none"> <li>▪ A site incident register;</li> <li>▪ A non-conformance register;</li> <li>▪ A public-complaints register; and</li> <li>▪ A register of audits.</li> </ul> </li> </ul>
Sub-consultant	<ul style="list-style-type: none"> <li>— The above responsibilities listed for the Contractor will also apply to any appointed sub-consultants.</li> </ul>

**RESPONSIBLE PERSON    RESPONSIBILITIES**

<p>Environmental Control Officer (<u>Independent EAP</u>)</p>	<ul style="list-style-type: none"> <li>— A suitably qualified independent ECO who would, on a monthly basis (or as necessary depending on the construction activities), monitor the project compliance with the conditions of the EA and the EMPr; and</li> <li>— The costs of the ECO shall be borne by RIM (proof of appointment must be maintained onsite).</li> </ul> <p>Responsibilities of the ECO include:</p> <ul style="list-style-type: none"> <li>— Be fully conversant with the BA Report, the conditions of the authorisations and the EMPr;</li> <li>— Be fully conversant with all relevant environmental legislation and relevant environmental policies and procedures, and ensure compliance thereto;</li> <li>— Ensure that environmental performance audits/inspections are undertaken on a weekly basis by the Site Manager or his/her designated representative to ensure implementation onsite;</li> <li>— Approve method statements;</li> <li>— Remain employed until the completion of the construction activities;</li> <li>— Hand over responsibilities to the operational team, if necessary, and</li> <li>— Report all findings identified onsite to the Project Manager.</li> </ul> <p>In addition, the ECO will:</p> <ul style="list-style-type: none"> <li>— Convey the contents of the conditions of the authorisations and the EMPr to the relevant site staff and discuss the contents in detail with the Project Manager and contractor(s);</li> <li>— Take appropriate action if the specifications contained in the authorisations and the EMPr are not followed;</li> <li>— Monitor and verify that environmental impacts are kept to a minimum, as far as possible; and</li> <li>— Ensure that activities onsite comply with all relevant environmental legislation.</li> </ul>
<p><u>Designated Environmental Officer (DEO) (RIM)</u></p>	<ul style="list-style-type: none"> <li>— Be fully conversant with the BA Report, the conditions of the authorisation (EA) and the EMPr, and ensure compliance thereto;</li> <li>— Monitor environmental performance of the facility and its operations <u>on a weekly basis</u>;</li> <li>— Ensure all staff remain aware of their responsibilities in terms of reducing environmental impacts.</li> </ul>
<p>Contractors, Staff and Service Providers</p>	<ul style="list-style-type: none"> <li>— Complying with RIM environmental management specifications;</li> <li>— Be conversant with all conditions of the authorisations and the EMPr, and ensure compliance thereto; and</li> <li>— Adhering to any environmental instructions issued by the Site Manager/Project Manager on the advice of the ECO during construction, and the Environmental Manager during operations.</li> </ul>

## 6.2 ENVIRONMENTAL AWARENESS PLAN

The NEMA requires that an environmental awareness plan be submitted as a part of the EMPr submission. The following methodology will be used to implement and ensure environmental awareness of employees:

- Internal Communication;
- Standard Meetings;
- Induction Training during Construction;
- On-going Training for permanent staff; and

- Providing a Complaints procedure.
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### **6.2.1 INTERNAL COMMUNICATION**

Internal Communication of environmental issues to ensure environmental awareness will be done by the following means:

- Meetings;
  - Memos;
  - Notice boards;
  - Briefs;
  - Newsletter;
  - E-mail;
  - Telephone; and
  - Induction training.
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### **6.2.2 STANDARD MEETINGS**

The Safety, Health and Environmental (SHE) Meetings will be held on a monthly basis by Senior Management. During these meetings discussions will be held regarding raising environmental awareness; identifying potential problems, and discussions regarding any complaints received and corrective actions taken.

All employees can also communicate to Senior Management through their reporting lines or by using complaint forms and incident forms to improve communication.

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### **6.2.3 TRAINING**

The following facets to training form part of the Environmental Awareness Plan:

- Environmental awareness training is given at induction when personnel commence employment. Specific environmental awareness induction training will be provided to all construction staff during the construction phase; and
  - Environmental competency training will be given to supervisory personnel at the processing operations and contractors working at RIM.
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### **6.2.4 COMPLAINTS PROCEDURE**

Enquiries or complaints should be able to be received from the community (i.e. stakeholders) in verbal or written form, through the various channels such as, but not limited to:

- Telephone
- Email
- Post

Community enquiries or complaints must be brought to the attention of the Project Manager/Site Manager and ECO (during construction) and the Environmental Manager (during operations) who should ensure corrective action and close-out. As a minimum the following information should be recorded:

- Time, date and nature of enquiry or complaint.
- The means by which the enquiry or complaints was made.
- Personal details of the person / party lodging the enquiry or complaint (subject to privacy considerations).
- Actions taken to investigate and close-out the complaint as well as complainant feedback.

All complaints received are to be investigated and a response (even if pending further investigation) to be given to the complainant within 7 days.

Any actions that cannot be managed immediately should be assigned to the appropriate personnel and will become an outstanding action. The action remains outstanding until it is closed off by the Project Manager / Site Manager during construction, and Environmental Manager during operation.

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## 6.3 MONITORING

**Construction Phase:** The independent ECO will undertake monthly audits to ensure compliance with the EMPr and conditions of the environmental authorisation during the construction activities, and will report to the Project/Site Manager should any non-compliance be identified or corrective action be deemed necessary. Monthly ECO monitoring reports will be submitted to RIM as well as DFFE.

**Operational Phase:** The RIM Environmental Manager will monitor the day-to-day site activities on an ongoing basis and will produce monthly monitoring reports. Monthly monitoring of the waste receiving area, effluent discharge quality and emission abatement equipment will be undertaken, as a minimum.

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## 6.4 NON-CONFORMANCE AND CORRECTIVE ACTION

The auditing of the construction activities may identify non-conformances to the EMPr and conditions of the authorisations. Non-conformances may also be identified through incidents, emergencies or complaints recorded. In order to correct non-conformances, the source must be determined, and corrective actions must be identified and implemented.

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### 6.4.1 COMPLIANCE WITH THE CONDITIONS OF THE AUTHORISATIONS AND EMPr

- A copy of the environmental authorisation and EMPr will be available onsite at all times for the duration of the construction and operational activities;
- All persons directly employed by RIM, a contractor, or their sub-contractors, will abide by the requirements of the EMPr and conditions of the authorisations;
- Any members of the workforce found to be in breach of any of the specifications contained within the EMPr and conditions of the authorisations may be ordered by the Site Manager to leave the site. A contractor will not direct a person to undertake any activity which would place them in contravention of the specifications contained within the EMPr and conditions of the authorisations;
- Should a contractor be in breach of any of the specifications, the Site Manager will, in writing, instruct the contractor responsible for the incident of non-compliance regarding corrective and/or remedial action required, specify a timeframe for implementation of these actions, implement a penalty and/or indicate that work will be suspended should non-compliance continue;
- Should non-compliance continue, further written notification will be forwarded to the contractor responsible for the incident of non-compliance outlining the required corrective and/or remedial action, the timeframe for implementation, penalties and/or work will be suspended as specified previously; and
- Departmental officials will be given access to the property referred to in the authorisations and EMPr, for the purpose of assessing and/or monitoring compliance of the site, at all reasonable times.

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### 6.4.2 DUTY OF CARE

Under Section 28 of the NEMA, all personnel involved with the construction and operational activities onsite will be responsible for implementing measures to prevent pollution or degradation of the environment from occurring, continuing, or recurring. Failure to comply with the above conditions is a breach of the duty of care.

If such harm is unavoidable, steps must be taken to minimise and rectify such pollution or degradation of the environment.

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## 6.5 DOCUMENTATION AND REPORTING

The following documentation must be kept onsite in order to record compliance with the conditions of the authorisations and EMPr:

- Record of complaints; and
- Record of emergencies and incidents.

The contractor will be required to report on the following:

- Environmental incidents involving contractor/employees and/or the public;
- Environmental complaints and correspondence received from the public; and
- Incidents that cause harm or may cause harm to the environment.

The above records will form an integral part of the ECO's reports and records thereof maintained for the duration of the project. These records will be kept with the authorisations and EMPr and will be made available for scrutiny if requested by the engineer, or his delegate, and the ECO.

The contractor will ensure that the following information is recorded for all environmental complaints/incidents/emergencies:

- Nature of complaint/incident/emergency;
- Causes of complaint/incident/emergency;
- Party/parties responsible for causing complaint/incident/emergency;
- Immediate actions undertaken to stop/reduce/contain the causes of the complaint/incident/emergency;
- Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint/incident/emergency;
- Timeframes and the parties responsible for the implementation of the corrective or remedial actions;
- Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented; and
- Copies of all correspondence received regarding complaints/incidents/emergency.



# 7 ENVIRONMENTAL MANAGEMENT PROGRAMME

## 7.1 SITE SPECIFIC CONTROL MEASURES

The EMPr identifies various actions which are undertaken throughout the construction, operational and closure phases. Not every action will be required during the entire course of activities. Therefore, the actions identified in the EMPr have been given priority timeframes for proposed implementation.

**Table 7-1: Structure of the EMPr**

COLUMN	DESCRIPTION
Activity/Aspect	Highlights the various activities/aspects associated with the project (i.e. the contractors' activities that will interact with the environment).
Environmental Measures and Action Plans	Indicates the actions required to prevent and /or minimise the potential impacts on the environment that are associated with the project.
Responsibility	Indicates the party responsible for implementing the environmental measures and action plans laid out in the EMPr. Please note that the Project/Site Manager will have authority to stop works if/as necessary.
Priority Timeframe	Indicates when the actions for the specific aspect must be implemented and/or monitored.

The following assumptions have been made in the development of the environmental specification in this EMPr:

- An environmental file containing the information/documentation required by this EMPr is to remain onsite and to be made available at the request of the auditor or similar monitoring body; and
- For ease of reference, any person(s) employed to assist in the project (i.e. contractors, sub-contractor and permanent and temporary staff), will be collectively referred to as 'onsite personnel'.

It should be noted that at this point of the project planning process, the necessity for and timing of the decommissioning phase is unknown. Before decommissioning, RIM will need to follow the related legal permitting process in terms of the NEMA and other legislation applicable at the time. The future associated permitting process will further supplement any commitments made within this document.

**Table 7-2** outlines the EMPr for the proposed project. The relevant phase / timeframe (i.e. construction, operation or post-construction) relevant to each mitigation measure is included in the table.

None of the management measures are required to be included in the environmental authorisation and there are no additional monitoring requirements.

**Table 7-2: Environmental Management Programme**

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
<b>ADMINISTRATIVE REQUIREMENTS</b>			
Objectives:	<ul style="list-style-type: none"> <li>– To define roles and responsibilities for environmental management;</li> <li>– To promote environmental awareness; and</li> <li>– To ensure suitable environmental training and induction to all employees.</li> </ul>		
Indicator and Compliance Mechanisms:	<ul style="list-style-type: none"> <li>– Environmental incidents register.</li> <li>– Close-out on incidents received.</li> <li>– Induction training and register.</li> <li>– Environmental awareness programme.</li> <li>– Bi-annual monitoring reports.</li> </ul>		
Environmental Awareness, Roles and Responsibilities for Environmental Management	<p>RIM must appoint a DEO to be responsible for ensuring:</p> <ul style="list-style-type: none"> <li>– Weekly monitoring of activities during construction to ensure compliance with the EMPr.</li> <li>– Ensuring environmental awareness among members of the construction workforce through daily/weekly toolbox talks.</li> <li>– Ensuring that all contractor(s) and members of the workforce are aware of the requirements of the EMPr.</li> <li>– Implementing preventative and corrective actions in accordance with the requirements of the EMPr and outcomes of environmental audits.</li> <li>– Reporting of environmental incidents within the environmental incidents register that may occur on-site and off-site during transportation of hazardous waste, in accordance with the requirements of the EMPr and relevant environmental legislation.</li> <li>– Ensure that method statements are compiled and submitted to the ECO for approval prior to initiating with a construction phase.</li> </ul>	RIM DEO	Construction

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	DEO must undertake six monthly (biannual) monitoring of activities during operation to ensure compliance with the EMPr (this aspect is likely to be undertaken by RIM Environmental Manager/Officer).	RIM DEO	Operation
	All new staff to obtain induction training on the site EMPr requirements and company procedures/ codes of conduct as well as the O+M/ Hazop procedures associated with the SPP.	RIM DEO	Operation
	Implementing preventative and corrective actions in accordance with the requirements of the EMPr and outcomes of environmental audits.	RIM DEO	Operation
	<u>Contractors, Sub-contractors, Suppliers and Employees</u> <ul style="list-style-type: none"> <li>– All contractors, sub-contractors, suppliers and employees must adhere to the EMPr at all times.</li> <li>– Provide evidence to the DEO that the EMPr is being implemented and adhered to (through weekly internal monitoring during operation).</li> </ul>	RIM DEO	Operation
Environmental Training and Induction	All staff must be trained in avoiding damage and disturbance to the natural environment during construction.	RIM DEO	Construction
	All Staff must be trained in the relevant RIM procedures, for example the RIM Policy on Access and Control, or relevant fire procedures.	RIM DEO	Construction
	Ensure all employees are supplied with the correct personal protective equipment.	RIM DEO	Construction Operation
	As far as possible, local labourers will be appointed for skilled and semi-skilled positions.	RIM DEO	Construction Operation
	Principles of equality, BBBEE, gender equality and non-discrimination must be implemented where possible.	RIM DEO	Construction Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Workers must be regularly briefed by the site manager on the do's and don'ts of working on Robben Island in terms of conduct.	RIM DEO	Construction Operation
	Ensure compliance to the Occupational Health and Safety Act (85 of 1993) requirements.	RIM DEO	Construction Operation
	All contractors, sub-contractors and employees must acknowledge their under-standing of the EMP and environmental responsibilities by signing an induction attendance record.	RIM DEO	Construction Operation
	All staff must be trained on the relevance of working on a World Heritage Site and the appropriate codes of conduct which must be followed.	RIM DEO	Construction Operation
	All staff must be trained in the handling of hazardous chemicals/ substances and safe handling procedures.	RIM DEO	Operation
Environmental Awareness	An environmental awareness programme is in place for all on-site personnel describing the key environmental issues and potential impacts thereof. This must include specific training provided by the heritage specialist relating to heritage and paleontological aspects of the study.	RIM DEO	Construction
Duty of Care	Robben Island Museum must take reasonable measures to prevent pollution or degradation of the environment 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.	RIM DEO	Construction Operation
<b>WORK AND COMMENCEMENT AND CONSTRUCTION CAMP ESTABLISHMENT</b>			
Objectives	<ul style="list-style-type: none"> <li>— Ensure sound environmental management during the erection of the construction camp.</li> <li>— An independent ECO must be appointed to monitor the construction activities on site.</li> <li>— The ECO should work closely with the nominated Robben Island Museum DEO.</li> </ul>		
Indicator / Compliance Mechanism	<ul style="list-style-type: none"> <li>— Method statements completed and submitted.</li> <li>— ECO appointed to undertake monthly audits during construction.</li> </ul>		

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	<ul style="list-style-type: none"> <li>– Weekly audit reports by DEO.</li> <li>– Waybills of safe removal of waste/ spoil/ rubble/ wastewater.</li> <li>– Machinery maintenance and safety certificate must be required from each separate hire company for each piece of equipment hired, where applicable</li> </ul>		
Construction Camp activities	Method statements should be submitted to the ECO for approval prior to the commencement of any construction activity.	RIM DEO Independent ECO	Construction
	Appropriate waste facilities (heavy, non-tip bins with lids) must be provided at the construction camp in order to ensure that no littering of the site occurs. The bins provided must allow for the segregation of waste which should be emptied on a regular basis.	RIM DEO	Construction
	Before construction can begin, the contractor shall submit to the engineer and ECO for his/ her approval, plans of the exact location, extent and construction details of these facilities and the impact mitigation measures the contractor proposes to put in place. The camp site shall be selected such that it avoids the need to remove any indigenous tree species.	RIM DEO	Construction
	Detailed, electronic colour photographs shall be taken of the proposed site before any clearing may commence. These records are to be kept by the engineer for consultation during rehabilitation of the site.	RIM DEO Independent ECO	Construction
	The construction camp must be continuously fenced with 20mm PVC mesh fencing to prevent entry into camp by endangered African Penguins.	RIM DEO	Construction
	Fencing should also effectively screen unsightly aspects from public and visitors view including excavations (where practical), construction material storage areas, waste storage areas and ablutions.	RIM DEO	Construction
	Should an African Penguin nesting site be encountered during camp set up activities or otherwise, works in the vicinity of the nest must cease and a representative of the Southern African Foundation for the Conservation of Coastal Birds (SANCCOB) must be consulted to safely relocate the nest.	RIM DEO Independent ECO	Construction
	Appropriate ablation facilities must be provided which may include dry composting toilets such as "enviroloos" or chemical toilets supplied by a contractor. Soak-aways and septic tanks may not be used.	RIM DEO	Construction

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	There is an existing ablution block in close proximity to the site that should be used for the duration of the construction phase. Should additional chemical toilets be required, these must be provided with locks and doors and shall be secured to prevent them from blowing over and located in close proximity to the construction area.	RIM DEO	Construction
	A chemical/hazardous substance storage and working area must be identified and designated and placed on/in impermeable layer and within bunding to prevent unauthorised entry or possible risk of spillage.	RIM DEO	Construction
	Good housekeeping shall be exercised at all times on site.	RIM DEO Independent ECO	Construction Operation
	Potentially contaminated stormwater runoff during construction should be captured where feasible and treated/disposed of as contaminated wastewater.	RIM DEO	Construction
	All building waste must be collected and disposed of appropriately at a licenced landfill site at the end of the construction phase.	RIM DEO	Construction
<b>WASTE MANAGEMENT</b>			
Objectives:	<ul style="list-style-type: none"> <li>— Ensure sound environmental management regarding waste management during the construction phase of the project.</li> <li>— To manage waste in a manner that prevents detrimental impacts on the environment. Ensure sound environmental management regarding waste management during the operational phase of the project</li> <li>— To transport store and handle hazardous waste in a safe manner.</li> <li>— Transport of hazardous waste materials must be limited as far as possible and should be transported in appropriate containers.</li> </ul>		
Indicator and Compliance Mechanisms:	<ul style="list-style-type: none"> <li>— Induction training and records.</li> <li>— Emergency preparedness and response procedure.</li> <li>— Incident Classification and Reporting Management Procedure.</li> <li>— Health, safety, environmental and community incident and complaints management system register.</li> <li>— Monitoring and audit reports.</li> <li>— Proof of waste service providers' accreditation with the City of Cape Town.</li> </ul>		

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	<ul style="list-style-type: none"> <li>– Proof that waste collectors have permits to collect and manage waste collected</li> <li>– Electronic or hard copy Complaints /Incidents/non-conformance register.</li> <li>– Safe Disposal Certificates</li> <li>– Close-out on incidents received</li> </ul>		
<b>General Waste Management</b>	Waste must be disposed of at an appropriate landfill site by an approved contractor.	RIM DEO Contractor	Construction
	The construction camp should be kept in an orderly state at all times. Littering is prohibited.	RIM DEO Contractor	Construction
	All construction materials and wastes, shall be removed from the site on completion of the contract.	RIM DEO Contractor	Construction
	Suitably covered and tip-proof receptacles must be available at all times and conveniently placed for the disposal of waste generated during construction. These receptacles must be emptied on a regular basis.	RIM DEO Contractor	Construction
	Separation of wastes for recycling must be encouraged throughout the construction period.	RIM DEO Contractor	Construction
	Under no circumstances is waste to be burnt or buried on-site.	RIM DEO Contractor	Construction
	Relevant RIM waste procedures must be followed.	RIM DEO Contractor Independent ECO	Construction Operation
	Solid waste including grit and screenings shall be handled, stored, transported and disposed of in such a manner which does not cause flies or other nuisance any health hazard or secondary pollution.	RIM DEO Contractor	Construction
	RIM is responsible for ensuring that sludge is tested (within 180 days) to ensure that the content of heavy metals is within acceptable limits in line with the Sewage/Sludge Status Quo Report (2020/21). If the results of the testing confirm that the sludge is suitable to be used as fertiliser as is anticipated,	RIM DEO	Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	then a maximum of 10m <sup>3</sup> of dried sludge per year can be spread out over an area adjacent to the WWTW, 15 or 20 mm thick, depending how wide it is spread or throughout the island as required. <sup>3</sup>		
	A waste disposal certificate must be obtained for hazardous waste disposal and kept on record.	RIM DEO Contractor	Construction Operation
	Records must be maintained of all waste removed from site including: <ul style="list-style-type: none"> <li>– Nature of wastes generated;</li> <li>– Amounts of each different type of waste generated within a specific period; and</li> <li>– Method of disposal.</li> </ul>	RIM DEO Contractor	Construction Operation
	<u>Should the WWTW have the capacity to store more than 80m<sup>3</sup> of hazardous waste and/or 100m<sup>3</sup> of general waste at any one time and for longer than 90 days, the WWTW will need to register and adhere to the National Norms and Standards for the Storage of Waste published in GN No. 926 of 29 November 2013 and promulgated in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008). This applies to the on-site storage of the sludge as well.</u>	<u>RIM DEO</u>	<u>Operation</u>
Hazardous Waste Management	Ensure all staff is trained in hazardous waste handling and disposal and that the potential health or hazards of handling such waste are explained.	RIM DEO Contractor Independent ECO	Construction Operation
	Hazardous material and waste storage must be in a designated controlled, bunded area with hardstanding.	RIM DEO Contractor	Construction
	Staff must be supplied with appropriate PPE to handle hazardous wastes/ substances.	RIM DEO Contractor	Construction
	Transport of hazardous waste materials must be limited as far as possible and should be transported in appropriate containers.	RIM DEO Contractor	Construction

<sup>3</sup> Should the results of the testing indicate that the sludge is not suitable to be used as fertiliser, then the sludge will be disposed of appropriately at a licensed landfill site or to a municipal WWTW off the island.



ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	MSDS for hazardous substances must be readily available and displayed within areas where the substances are permanently stored. MSDS should include information pertaining to environmental impacts and measures to minimise and mitigate against any potential environmental impact which may result from a spill or leakage.	RIM DEO Contractor	Construction
	Hazardous waste must be kept in a separate and appropriate container (i.e. a covered skip). <u>Screening bins must be covered and placed on an impermeable surface.</u>	RIM DEO Contractor	Construction
	Hazardous waste must be disposed of at the Vissershok hazardous landfill site. Safe disposal certificate must be obtained	RIM DEO Contractor	Construction
	Records of hazardous waste being taken off-site must be kept as evidence.	RIM DEO Contractor	Construction
	Hazardous waste materials (e.g. non-biodegradable wastes from screenings; paint pots, oils) to be disposed of via a licensed hazardous waste contractor. Ensure safe waste disposal certificates are obtained from the contractor. <u>Screenings must be removed to a licensed hazardous waste facility on a monthly basis.</u>	RIM DEO Contractor	Construction Operation
	Ensure that the DWA “Minimum Requirements for Handling, Classification and Disposal of Hazardous Waste” with specific reference to Section 10: “Waste handling, storage and transportation” are taken into account.	RIM DEO Contractor	Construction
	The transport vehicle must be provided with the appropriate hazchem placards and must be properly fitted to the vehicle.	RIM DEO Contractor	Construction
	The registered service provider must be licenced with the municipality.	RIM DEO Contractor	Construction
<b>SURFACE WATER MANAGEMENT</b>			
Objectives:	<ul style="list-style-type: none"> <li>— Ensure sound environmental management regarding surface water; and</li> <li>— Ensure the prevention of stormwater pollution</li> </ul>		

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
Indicator and Compliance Mechanisms:	<ul style="list-style-type: none"> <li>– Induction training and records.</li> <li>– Incident Classification and Reporting Management Procedure.</li> <li>– Close-out on incidents received</li> <li>– Stormwater Management Plan.</li> <li>– Electronic or hard copy of Complaints/Incidents/non-conformance register.</li> <li>– Minimum of monthly independent ECO audit reports.</li> <li>– Six Monthly monitoring reports.</li> <li>– Biannual monitoring reports.</li> </ul>		
Surface water commitments	A drainage system must be identified for the construction camp.	RIM DEO Contractor	Construction
	All potential stormwater contaminants must be bunded in the site camp to prevent run-off into the ocean. No liquid or substance other than uncontaminated rainwater runoff shall emanate from the construction site.	RIM DEO Contractor	Construction
	Drains at the drying beds must be regularly checked to avoid blockage of water flow to the sump.	RIM DEO	Operation
	Contamination of stormwater must be avoided at all times. If a pollution events occurs the DWS must be notified immediately.	RIM DEO Contractor	Construction Operation
	All leakages, spillages and incidents must be cleaned-up and reported as per the relevant spill response procedures.	RIM DEO Contractor	Construction Operation
	All maintenance or servicing of machinery must take place over hard standing or a drip tray.	RIM DEO	Operation
	All incidents involving stormwater contamination must be recorded in the incidents register.	RIM DEO Contractor	Construction Operation
	Ensure that drying bed containment wall is not compromised. If found to be compromised take immediate action and rectify immediately.	RIM DEO	Operation
<b>FIRE AND SPILL PREVENTION</b>			

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
Objectives	To ensure fires and spillages on site do not cause unnecessary destruction to surrounding environment or injury to personnel.		
Indicator and Compliance Mechanisms:	<ul style="list-style-type: none"> <li>– Electronic or hard copy of Complaints/Incidents/non-conformance registers.</li> <li>– Emergency Preparedness and Response Plan.</li> <li>– Firefighting measures (extinguishers).</li> <li>– Spill kits available and staff trained on use.</li> <li>– Close-out on incidents received.</li> <li>– Minimum of monthly independent ECO audit reports.</li> <li>– Six Monthly monitoring reports.</li> <li>– Biannual monitoring reports.</li> </ul>		
Fire and spill prevention	Knowledge of the appropriate RIM fire procedures may be required to be demonstrated to the ECO.	RIM DEO Contractor	Construction Operation
	Any construction equipment that has the potential to leak oil must be placed on a drip tray.	RIM DEO Contractor	Construction
	Firefighting measures, such as fire extinguishers, must be serviced (annually) and located on-site close to high-risk areas (e.g. generators) and the workforce must be made aware of fire prevention and firefighting measures.	RIM DEO Contractor	Construction Operation
	No uncontrolled fires will be permitted on-site. The contractor shall ensure that energy sources are available at all times for construction and supervision personnel for heating and cooking purposes if required for lunch times.	RIM DEO Contractor	Construction Operation
	All equipment should be in good working order to prevent spillage occurring. The emergency generator and all equipment or vehicles capable of leaking oil must be placed on a drip tray.	RIM DEO Contractor	Construction Operation
	Spill kit must be available at all times.	RIM DEO Contractor	Construction Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Any incidents involving a significant spill (e.g. of untreated sewage) must be recorded in the incidents register and reported to the DEO.	RIM DEO Contractor	Construction Operation
	Should any hazardous spills occur on site the relevant clean-up specialists must be contacted and the relevant response procedure employed by RIM. Absorbent material must be placed over the spill and subsequently disposed of as hazardous material.	RIM DEO Contractor	Construction Operation
	In the event of a spill the sea must be protected from any spillage run- off.	RIM DEO Contractor	Construction Operation
	In the event of a spill or a leak of raw sewage into the ground and or sea this must be reported (within 14 days) to all the relevant authorities including the Directorate: Pollution Management in accordance with Section 30(10) and Section 20(3) of the NWA.	RIM DEO Contractor Independent ECO	Construction Operation
	<u>Smoking can only take place within designated areas, as designated by RIM. Cigarette butts pollute the environment (including the soil) and could be swallowed by the numerous birds in this area. As such, cigarette butt bins (wet sand filled) must be provided and must be emptied on a daily basis.</u>	RIM DEO Independent ECO	Construction Operation
	All incidents must be recorded in the incidents register.	RIM DEO Contractor	Construction Operation
	<u>The WWTW area should be demarcated with suitable emergency and safety signage. Emergency numbers for the local police and fire department must be placed in a prominent, clearly visible area on site.</u>	RIM DEO Contractor	Construction Operation
	The Emergency Preparedness and Response Plan for the site must be updated to include the WWTW.	RIM DEO Contractor	Construction Operation
<b>FLORA AND FAUNA MANAGEMENT</b>			
Objectives:	To avoid harm, damage or loss to indigenous vegetation and wildlife.		

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
Indicator and Compliance Mechanisms:	<ul style="list-style-type: none"> <li>– Environmental incidents register</li> <li>– Close-out on incidents received</li> <li>– Biannual monitoring reports</li> </ul>		
Vegetation Management	The natural vegetation encountered on the site is to be conserved and left as intact as possible. Only alien trees and shrubs directly affected by the works, and such others as may be indicated by the engineer and ECO in writing may be felled or cleared. Where natural vegetation has been cleared out of necessity, same species indigenous trees as previously existing in the area shall be re-established.	RIM DEO	Construction
	The area where the site offices will be erected will require rehabilitation at the end of the construction period. This should be completed with indigenous vegetation that is naturally occurring in the area of vegetation.	RIM DEO	Construction
	A shaded nursery must be incorporated into the camp set-up where indigenous plants removed from the footprint of the WWTW are stored and maintained for the duration of the construction period and reused for rehabilitation of the construction area.	RIM DEO	Construction
	Topsoil shall be removed from all areas where physical disturbance of the surface will occur and shall be stored and adequately protected for re-use during rehabilitation (berm).	RIM DEO Contractor	Construction
	Topsoil will only be stockpiled for a short duration before being used to construct the berm adjacent to the facility. The topsoil stockpiles shall be stored, ensuring that they do not interfere with the flow of water to cause damming or erosion, or itself be eroded by the action of water. Stockpiles of topsoil shall not exceed a height of 2m and shall be protected against infestation by weeds.	RIM DEO Contractor	Construction
	Only indigenous vegetation natural to the area and as agreed to by RIM may be used for the purposes of landscaping during the operational phase.	RIM DEO	Operation
Fauna Management	All open holes /excavation pits must be covered at night-time with a solid barrier. If possible, the use of trenching techniques which minimise the area of open excavation should be utilised.	RIM DEO Contractor	Construction
	Should an African Penguin nesting site be encountered during site clearing activities or otherwise, works in the vicinity of the nest must cease and a representative of the Southern African Foundation for the Conservation of Coastal Birds (SANCCOB) must be consulted to safely relocate the nest.	RIM DEO Contractor Independent ECO	Construction

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	If an African Penguin nesting site is discovered in the construction zone, or if an injured, trapped or distressed penguin is discovered in the vicinity of the construction works, works in the vicinity of the penguin/s must be stopped and the engineer informed of the discovery. SANCOBB and Cape Nature must be contacted to determine the appropriate course of action.	RIM DEO Contractor INDEPENDENT ECO	Construction
	Staff must take extreme care not to harm or disturb the African Penguin populations, particularly during moulting periods (typically November to January).	RIM DEO Contractor	Construction Operation
	<u>Penguins, chicks and any other form of wildlife must have the right of way. RIM have a permanent SANCOBB representative on the island. The SANCOBB representative will be required to undertake active surveys of the proposed construction site prior to construction commencing for a period of 6 weeks. The representative will monitor and observe the penguin and other wildlife activity around the proposed WWTW site. If penguins, chicks or other wildlife are observed and deemed to be at risk of construction traffic, the incumbent will be required to remain at the site during active construction periods to protect the penguins, chicks and any other form of wildlife by indicating to vehicles when it is safe to drive through.</u>	<u>RIM DEO Contractor</u>	<u>Construction Operation</u>
	The WWTW and drying bed facility must be fenced with penguin proof security fencing to avoid unauthorised entry by persons or birdlife (i.e. African penguin). Netting must be placed over the drying beds to prevent the ingress of birdlife. <u>An avifaunal specialist should be consulted with regard to the type of netting utilised as well as the aperture size of the netting to ensure that birds do not become entangled in the proposed netting.</u>	RIM DEO	Operation
<b>MARINE ENVIRONMENT</b>			
Objectives:	To avoid harm, damage to marine environment.		
Indicator and Compliance Mechanisms:	<ul style="list-style-type: none"> <li>– Electronic or hard copy of Complaints/Incidents/Non-conformance registers.</li> <li>– Environmental incidents register</li> <li>– Close-out on incidents received</li> <li>– Minimum of monthly independent ECO audit reports.</li> <li>– Effluent water quality monitoring reports.</li> <li>– Receiving Water Body Monitoring Reports.</li> </ul>		

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
Marine Management	If feasible, schedule construction activities so as to avoid the main seabird breeding periods (March to October), and penguin moulting periods (typically November to January);	RIM DEO	Construction
	Prior to commencement of construction, ensure that there are no known nests in the development footprint;	RIM DEO	Construction
	Construction should be limited to hours when the penguins are not moving around (~90 minutes after sunrise to 90 minutes before sunset) to minimise the impact on birds using the path along the coast.	RIM DEO Contractor	Construction
	Ensure that a penguin-proof perimeter fence is installed around the site boundary prior to commencement of construction activities to prevent penguins accidentally becoming trapped within the construction site. <u>No electrified fencing, barbed wire, razor wire or spikes should be used in the construction of the perimeter fencing.</u>	RIM DEO	Construction
	Any cement mixing that may occur on site must be undertaken on a non-permeable sheet/layer and sufficiently bunded to prevent spillage.	RIM DEO Contractor	Construction
	Monitor establishment of potential Hartlaub's Gulls and Swift Terns breeding areas in the vicinity of the construction site during December/early January and if necessary deter them from starting to breed near the construction site by using the presence of people to scare them off at the start of the breeding season until they start to breed elsewhere on the island.	RIM DEO	Construction
	Spoil piles or newly formed berm to be covered on windy days to minimise wind blowing or sedimentation of marine or surface water resources.	RIM DEO Contractor	Construction
	All effluent water from the camp / office sites shall be disposed of in a properly designed and constructed system, situated so as not to adversely affect water sources (groundwater, marine resources).	RIM DEO Contractor	Construction
	Ensure that settling tanks are suitably covered with screens to prevent birds getting into the tanks.	RIM DEO	Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	<u>Implement appropriate pollution control, water quality monitoring, water quality improvement interventions, disaster/emergency response planning and coordination of activities in accordance with the Western Cape Sustainable Water Management Plan (2018) and waste management measures.</u>	RIM DEO	Operation
Measurement of Effluent	Ensure that the sewage effluent conforms with the General Limit Values to discharge to the sea.	RIM DEO	Operation
	<p>Monitor discharge water quality weekly until sufficient data have been collected to allow a statistically robust prediction that the levels will fall below the guideline levels 95% of the time. (The minimum measurement period would be 12 months, and the more the variations in the data collected over this period the longer the monitoring would need to continue). Thereafter, monitor at bi-weekly (2 week) intervals. The following parameters should be measured:</p> <ul style="list-style-type: none"> <li>— Total suspended solids</li> <li>— Salinity</li> <li>— pH</li> <li>— Dissolved oxygen</li> <li>— Biological Oxygen Demand</li> <li>— Dissolved nutrients (nitrite, nitrate, ammonium, reactive phosphate and reactive silicate)</li> <li>— Faecal coliform bacteria</li> <li>— Chlorine</li> </ul> <p>Ensure that the analyses are carried out by a laboratory certified (by the South African National Accreditation Service) to conduct the analyses.</p>	RIM DEO	Operation
	Effluent monitoring results must be scientifically evaluated by an appropriately qualified independent consultant on an annual basis.	RIM DEO	Operation
	Submit the monitoring results together with the evaluation to the DWS and DFFE on an annual basis.	RIM DEO	Operation
	Should concentrations of phosphates be higher than anticipated (as suggested in the modelling report) specific mitigation measures to reduce phosphate concentrations may need to be implemented.	RIM DEO	Operation



ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
Measurement of Receiving Water Body	Ensure that the South African Marine Water Quality Guidelines (DWA 1995): Maintenance of the Ecosystem are achieved for ALL constituents of the effluent, within 100 m of the diffuser.	RIM DEO	Operation
	<p>On commissioning of the Waste Water Treatment Works, monitor the quality of the receiving waters once every 2 weeks at distances of 10 m, 50 m and 100 m to the north, south, west and east of the diffuser to verify the predictions of the dilution model. Monitoring should continue until sufficient data have been collected to allow a statistically robust prediction that the levels will fall below the guideline levels 95% of the time. (The minimum measurement period would be 4 months, and the more the variations in the data collected over this period the longer the monitoring would need to continue). The following parameters should be measured within a predetermined grid around the diffuser:</p> <ul style="list-style-type: none"> <li>— Total suspended solids</li> <li>— Salinity</li> <li>— pH</li> <li>— Dissolved oxygen</li> <li>— Biological Oxygen Demand</li> <li>— Dissolved nutrients (nitrite, nitrate, ammonium, reactive phosphate and reactive silicate)</li> <li>— Faecal coliform bacteria</li> </ul>	RIM DEO	Operation
	Monitoring should continue on a quarterly basis thereafter (every 3 months) for at least three years.	RIM DEO	Operation
	Ensure that the analyses are carried out by a laboratory certified (by the South African National Accreditation Service) to conduct the analyses.	RIM DEO	Operation
	Have the monitoring results scientifically evaluated by an appropriately qualified independent consultant on completion of the three-year monitoring programme.	RIM DEO	Operation
	Submit the monitoring results together with the evaluation to the DWS and DFFE on an annual basis.	RIM DEO	Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
<b>CULTURAL HERITAGE / PALEONTOLOGY</b>			
Objectives:	To ensure that appropriate steps are taken should any cultural and/or heritage aspects be identified on site.		
Indicator and Compliance Mechanisms:	<ul style="list-style-type: none"> <li>— Proof of notification/liaison/close-out with SAHRA should any artefacts be uncovered</li> <li>— Proof of contract with heritage specialist for excavation works.</li> <li>— Minimum of monthly independent ECO audit reports.</li> </ul>		
Heritage and Palaeontology Management	<u>A permit in terms of section 27(18) of the NHRA must be applied for from SAHRA for the entire development. The permit application must be submitted prior to the construction phase.</u>	RIM DEO	<u>Pre-construction</u>
	A heritage specialist must be engaged throughout the construction process and “on call” during all excavation works in the case that any object of heritage or paleontological significance is unearthed.	RIM DEO Independent ECO	Construction
	Should any item or artefact of archaeological or heritage significance be discovered during excavation activities, the contractor will be required to cease works and contact the heritage specialist who will liaise with SAHRA to determine best course of action before the site is disturbed any further. Permission to re-commence works must be provided in writing.	RIM DEO Independent ECO	Construction
	Substantial fossil finds during construction, must be safeguarded - preferably in situ - and reported by the ECO as soon as possible to SAHRA, so that appropriate mitigation (i.e. recording, sampling or collection) by a paleontological specialist can be considered and implemented	RIM DEO Independent ECO	Construction
	<u>A buffer zone of 5 m must be maintained around the Robert Sobukwe House and 30 m around the possible WW2 bunker. No parking of vehicles, placing of construction material or other activity may occur within these buffer zones in order to ensure no direct impacts. These buffer zones must be clearly marked using danger tape. No workers may be allowed to enter the bunker.</u>	<u>RIM DEO</u> <u>Independent ECO</u>	<u>Construction</u>
	<u>An archaeologist must monitor the ground clearance and excavation phase. The monitoring must include inspections of the bunker after any intense drilling to ensure the structure is still intact. A monitoring report must be submitted to SAHRA upon completion of the construction phase.</u>	<u>RIM DEO</u> <u>Archaeologist</u> <u>Independent ECO</u>	<u>Construction</u>

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
<b>NOISE MANAGEMENT</b>			
Objectives:	<ul style="list-style-type: none"> <li>– To ensure that noise impacts to the surrounding environment are minimal or mitigated.</li> <li>– To adhere to the South African National Standards (SANS) 10103:2008 noise limits.</li> <li>– To manage the noise that may arise from site during operation.</li> </ul>		
Indicator and Compliance Mechanisms:	<ul style="list-style-type: none"> <li>– Minimum of monthly independent ECO audit reports.</li> <li>– Staff wearing appropriate PPE</li> <li>– Electronic or hard copy Complaints /Incidents/Non-Conformance register</li> </ul>		
Noise Management	Noisy activities which may exceed 50dB(A) should only be carried out outside of visitor hours and before 8 pm to avoid disturbance to visitors, fauna or residents on Robben Island.	RIM DEO Contractor	Construction
	Construction activities should be undertaken between 08h00 and 17h00 or in accordance with the requirements of the City of Cape Town.	RIM DEO Contractor	Construction
	Provision of Personal Protective Equipment (PPE) equipment in noisy areas, such as near the generator.	RIM DEO Contractor	Construction
	Care must be taken to avoid unnecessary disturbance to African Penguin present on the beach and avoid noisy works in the vicinity of the African penguin.	RIM DEO Contractor	Construction
	Construction activities may not exceed SANS 10103 noise levels. The SANS recommended residual sound levels for the type of receptor districts described for Suburban Residential Districts is 50 dB(A) LAeq during the day; and 40 dB(A) LAeq during the night.	RIM DEO Contractor	Construction Operation
	<u>Noise generated on site from all the proposed activities must comply with the Western Cape Noise Control Regulations published in Provincial Notice 200/2013.</u>	<u>RIM DEO Contractor</u>	<u>Construction Operation</u>
	Bi-annual OHS auditing as per the OHS Act.	RIM DEO	Operation
<b>TRAINING AND SOCIO-ECONOMIC ENVIRONMENT</b>			
Objectives:	<ul style="list-style-type: none"> <li>– To ensure that the negative socio-economic impacts are mitigated and managed.</li> </ul>		

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	<ul style="list-style-type: none"> <li>To ensure that staff has adequate training and are provided with necessary safety equipment. Furthermore, to enhance positive impacts on the local community.</li> </ul>		
Indicator and Compliance Mechanisms:	<ul style="list-style-type: none"> <li>Minimum of monthly independent ECO audit reports.</li> <li>Personal protective equipment registers.</li> <li>Induction training and register.</li> <li>Close-out on incidents and complaints received.</li> <li>Electronic or hard copy of environmental incidents and complaints register.</li> </ul>		
Training and Socio-economic commitments	Where reasonable and practical, procurement of required goods and services will have preference towards local labour and suppliers (where feasible).	Robben Island Museum	Pre-construction Construction
	The ECO must ensure that all direct and sub-contracted site personnel have a basic level of environmental awareness training that has been offered to them.	RIM DEO Independent ECO	Pre-construction Construction
	The engineer/ECO must be available to explain more difficult and technical environmental issues at project commencement.	Independent ECO	Construction
	The need for a 'clean-site' policy and excellent housekeeping must be explained to workers.	Contractor RIM DEO	Construction Operation
	The ECO must ensure that all site staff have been informed of the details of the EMPr document as well as the conditions of the Environmental Authorisation.	RIM DEO Independent ECO	Construction
	The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.	Robben Island Museum	Construction Operation
	Regular 'reminder' sessions must be included within the weekly-monthly toolbox talks being run by project manager to ensure that staff are reminded about environmental and safety issues and emergency procedures.	Independent ECO RIM DEO	Construction Operation
	<u>Prepare a Standard Operating Procedure (SOP) on minimising the risk of asphyxiation from methane gas build-up and undertake training on the SOP.</u>	<u>Independent ECO</u> <u>RIM DEO</u>	<u>Operation</u>

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Ensure all employees are supplied with the correct personal protective equipment.	RIM DEO Independent ECO	Construction
<b>AIR QUALITY</b>			
Objectives:	Ensure sound environmental management regarding air quality during construction and operation thereby preventing air pollution.		
Indicator and Compliance Mechanisms:	<ul style="list-style-type: none"> <li>– Electronic or hard copy of Complaints/Incidents/Non-Conformance registers</li> <li>– Close-out on incidents received.</li> <li>– Minimum of monthly independent ECO audit reports.</li> </ul>		
Dust and Particulate Matter	The contractor must ensure that necessary equipment is in place to control dust generated during construction, where required.	Contractor	Construction
	Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for soil/material stockpiles and berm especially. This includes wetting of exposed soft soil surfaces and not conducting activities during high wind periods which will increase the likelihood of dust being generated.	Contractor RIM DEO	Construction Operation
	<u>Dust generated during construction activities must comply with the National Dust Control Regulations promulgated in GN Notice No. R. 827 of 1 November 2013 in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)</u>	<u>Independent ECO</u> <u>RIM DEO</u>	<u>Construction</u> <u>Operation</u>
	<u>All potential air pollutants on-site need to be monitored and if causing significant emissions, must be mitigated strictly as per the recommendations stipulated in the EMPr.</u>	<u>Independent ECO</u> <u>RIM DEO</u>	<u>Construction</u> <u>Operation</u>
	A complaints register must be maintained on site and made accessible to interested and affected parties. All issues/complaints must be recorded in the complaints register.	Independent ECO RIM DEO	Construction Operation
	No burning of waste, such as plastic bags, cement bags and litter is permitted.	Contractor RIM DEO	Construction Operation
	A speed limit of 30 km/hr must be imposed on all construction related traffic on the island.	Contractor RIM DEO	Construction Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	All stockpiles (if any) must be restricted to designated areas and may not exceed a height of two (2) metres;	Contractor RIM DEO	Construction
	Ensure that all vehicles, machines and equipment are adequately maintained to minimise emissions.	RIM DEO Contractor	Construction Operation
	It is recommended that the clearing of vegetation from the site should be selective, be kept to the minimum feasible area, and be undertaken just before construction so as to minimise erosion and dust potential.		Construction Operation
Odour Management	Develop a vegetative environmental buffer (VEB) along the Western boundary of the proposed development site. A VEB will ameliorate odours by slowing wind and allowing dilution of odour, encouraging particulate and aerosol deposition, physical interception of dust and aerosols onto which odorous compounds can adhere, and offering a sink for the chemical constituents of odour. WSP recommends the use of indigenous <u>and waterwise</u> leafy shrubs or trees that maintain their leaves throughout the year. Multiple rows of shrubs or trees (with taller and shorter but bushier species alternating) will increase effectiveness of the barrier. Additional value of the VEB is protection from bioaerosols, noise mitigation and improved visual aesthetics.	RIM DEO	Operation
	Masking agents offer an additional odour neutralisation option should complaints arise despite the above recommendation. The efficacy of commercial additives varies widely, and local options can be investigated.	RIM DEO	Operation
	Complaints and any actions arising from a complaint must be recorded in a complaints register maintained by site management. If required, fenceline measurements of H <sub>2</sub> S will provide a real-time indicator of odour impact.	RIM DEO	Operation
	Warning communities to expect potential odour events during upset conditions (e.g. during desludging or when extended maintenance is scheduled) will generate increased trust and facilitate communication between parties. When possible, maintenance/desludging of the WWTW should be scheduled for times when fewer tourists are expected in the area or strategically planned so as not to coincide with proximate community events, if any.	RIM DEO	Operation
	Maintenance/desludging of the WWTW should be scheduled for times when fewer tourists are expected in the area, or strategically planned so as not to coincide with proximate community events, if any.	RIM DEO	Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Meteorological scheduling of maintenance/desludging for periods with dry and cool conditions should also be considered (where practicable) particularly when prolonged repair work or sludge drying is anticipated. Drier conditions will accelerate sludge drying, shortening the duration in which peak impacts may occur. Odorous emissions are generally higher in warmer months due to increased gas volatility.	RIM DEO	Operation
<b>VISUAL</b>			
Visual Management	Clearance of indigenous vegetation should be minimised and rehabilitated.	RIM DEO Contractor	Construction
	Ensure that vegetation is not cleared unnecessarily to make way for infrastructure.	RIM DEO Contractor	Construction
	The site should be kept neat and tidy. Littering should be fined.	RIM DEO Contractor Independent ECO	Construction
	<u>Ensure that the WWTW is set back 3m from the access road (on the north western side) to allow space for tree planting to occur.</u>	<u>RIM DEO Contractor</u>	<u>Construction</u>
	Screening of unsightly aspects from public view including excavations, construction material storage areas, waste storage areas and ablutions.	RIM DEO Contractor	Construction
	Retain / re-establish and maintain large indigenous shrubs, natural features and noteworthy natural vegetation in all areas outside of the activity footprint.	RIM DEO	Post construction
	Plan ancillary infrastructure in such a way and in such a location that clearing of vegetation is minimised. Consolidate existing infrastructure as much as possible, and make use of already disturbed areas rather than pristine sites wherever possible.	RIM DEO Contractor	Construction
	Keep infrastructure at design heights.	RIM DEO Contractor	Construction

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	<u>Fencing should be visually permeable (preferably green in colour) so as not to detract from the surrounding landscape.</u>	RIM DEO Contractor	<u>Construction</u> <u>Operation</u>
	Wherever possible, use materials, coatings, or paints that have little or no reflectivity and blends with the natural environment.	RIM DEO Contractor	Construction
	Rehabilitate all construction areas, when no longer required.	RIM DEO	Post construction
	Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.	RIM DEO	Operation
	Maintain the general appearance of the facility as a whole (i.e. repaint when required).	RIM DEO	Operation
	Monitor rehabilitated areas for plant growth, evidence of erosion etc., and implement remedial action as and when required.	RIM DEO	Post construction
	Use all spoil material salvaged from the construction works to create a planted earth mound/berm along the western perimeter of the development envelope. This mound should be organically designed to resemble a natural topographic feature ('dune shaped') and planted with hardy indigenous vegetation.	RIM DEO	Post construction





**Figure 7-1: Location of vegetated earth mound**

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
<b>REHABILITATION</b>			
Objectives:	To return disturbed sites to a natural state characteristic to the area.		
Construction site	All remaining construction infrastructure, building rubble and waste is to be removed from the site and disposed of by a licensed contractor or at a registered landfill site.	Contractor Independent ECO	Post construction
Landscaping	To rehabilitate the vegetation to a condition where it will become self-sustaining and can be kept in that condition with minimal management input.	RIM DEO	Post construction
	Rehabilitation measures using indigenous vegetation natural to the site as agreed to by RIM must be put into place.	RIM DEO	Post construction
	The area where the site offices will be erected will require rehabilitation at the end of the construction period. This should be completed with indigenous vegetation that is naturally occurring in the area of vegetation.	RIM DEO	Post construction

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## 7.2 MANAGEMENT PLANS

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### 7.2.1 STORMWATER MANAGEMENT

The main principles in stormwater management include:

- Confine or divert any unpolluted water to a ‘clean’ water system, and polluted water to a ‘dirty’ water system;
- ‘Clean’ and ‘dirty’ water systems must be designed and constructed to prevent cross-contamination between the ‘clean’ and ‘dirty’ water systems; and
- Appropriate maintenance and management of storm water related infrastructure.

The site water management systems or infrastructure are to prevent any potential contamination of natural water resources in the area.

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### 7.2.2 CHANCE FIND PROCEDURE

The following procedure must be considered in the event that previously unknown heritage resources, including fossil finds, burial grounds or graves, are exposed or found during the life of the project.

#### **CULTURAL HERITAGE, STRUCTURES, ARCHAEOLOGY, PALAEOLOGY, METEORS AND PUBLIC MONUMENTS**

- The heritage resource must be avoided and all activities in the immediate vicinity temporarily ceased;
- The RIM DEO and ECO must be notified of the discovery;
- A qualified specialist must be deployed to consider the heritage resource, either via communicating with the DEO via telephone or email, or based on a site visit and recommend appropriate mitigation measures;
- Should the specialist conclude that the find is a heritage resource protected in terms of the NHRA, the DEO will notify SAHRA and a Phase 2 rescue operation may be required subject to permits issued by SAHRA; and
- If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, SAHRA may require that a HIA in terms of NHRA Section 38 must take place that may include rescue excavations.

If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit ([Natasha Higgitt/Phillip Hine 021 462 5402](mailto:Natasha.Higgitt@sa.gov.za)) must be alerted as per section 35(3) of the National Heritage Resources Act (no. 25 of 1999) (NHRA). Non-compliance with section 35(3) of the NHRA is an offence in terms of section 51(1)e of the NHRA and item 5 of the Schedule.

#### **BURIAL GROUNDS AND GRAVES**

- In the event that human remains are accidentally exposed, the DEO and ECO must immediately be notified of the discovery in order to take the required further steps:
  - The local SAPS will be notified;
  - A suitably qualified specialist will be deployed to inspect the exposed burial and determine in consultation with the SAPS the temporal context of the remains, (i.e. authentic burial grave (informal or older than 60 years) or archaeological (older than 100 years)) and if any additional graves may exist in the vicinity;

- Should the specialist conclude that the find is a heritage resource protected in terms of the NHRA, the DEO will notify SAHRA;
- SAHRA may require that an identification of interested parties, consultation and /or grave relocation take place;
- Consultation must take place in terms of Regulations 39, 40 and 42 of NHRA; and
- Grave relocation must take place in terms of Regulation 34 of NHRA.

If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/Ngcabutho Madida 012 320 8490) must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section 36(3) of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule.

## 8 CONCLUSION

In terms of NEMA, everyone (i.e. all persons engaging in any component of this project) is required to take reasonable measures to ensure that they do not pollute the environment. 'Reasonable measures' includes informing and educating employees about the environmental risks associated with their work and training them to operate in an environmentally responsible manner.

RIM also recognises that, in terms of NEMA, the cost to repair any environmental damage will be borne by the person responsible for the damage. Should the above-mentioned environmental guidelines and mitigation measures be adopted, it is anticipated that the negative environmental impacts of the proposed project will be mitigated adequately. RIM and the selected Contractor shall appoint relevant personnel, as well as an independent ECO, to monitor the site periodically throughout construction to ensure that the required environmental controls are in place and working effectively. During operation and maintenance, the area specific Environmental Manager/Officer, with the support of the maintenance supervisor, will monitor environmental controls.

# APPENDIX

## 1 EAP CV





**Years with the firm**

10

**Years of experience**

22

**Professional qualifications**

EAPASA 2019/362

Pri.Sci.Nat 400638/15

**Areas of expertise**

Compliance Audits

Environmental Impact Assessment

Environmental and Social Impact Assessments

Feasibility Studies

Screening Studies

ESIA Gap Analysis

**CAREER SUMMARY**

Jacqui Fincham has 22 years working experience as an Environmental Consultant, undertaking Environmental Impact Assessments (EIAs) and Basic Assessments. She has also completed Environmental and Social Impact Assessments to the African Development Bank standards. She is experienced in developing Environmental Management Programmes (EMPs) undertaking site audits (due diligence and Environmental Control Officer), Sustainability Assessments (SAs) and Strategic Environmental Assessments (SEAs). She worked in the United Kingdom for 8 years from 2000 to 2008. She has vast project experience, with projects ranging from construction of pipelines, the relocation of power lines, diesel storage installations, harbour developments, agri-industrial parks, waste disposal sites, oil refineries, tank farm installations, recycling facilities, hospital redevelopment's, academy developments, bus station relocations, mixed-use developments, regeneration schemes, industrial developments and infrastructure projects which include wind and solar PV renewable energy technologies.

**EDUCATION**

Diploma in Sustainable Development, Staffordshire University, United Kingdom	2003
Bachelor of Science (Honours), Biotechnology, Rhodes University, Grahamstown, South Africa	1997
Bachelor of Science, Microbiology & Biochemistry, Rhodes University, Grahamstown, South Africa	1996

**ADDITIONAL TRAINING**

COVID-19 Return-To-Work Induction Training Course	2020
Employment Equity Training Programme, POP Training & Consulting	2020
OHS Act Legal Liability, Webinar	2020
Impact Measurement and Management, UCT Graduate School of Business	2018
Hazard Identification & Risk Assessment, Safety Risk Management	2017
Snake Awareness, Scorpion Awareness and First Aid for Snakebite and Scorpion Sting, African Snakebite Institute	2016
Guest Lecturer at CPUT Applied Sciences Faculty	2015
Cumulative Effects Assessment in EIA and SEA, Oxford Brookes University	2004
Data Processing and Modelling Course, University of the OFS	1999
Environmental Auditing, WITS University	1999
EIA Course, Potchefstroom University	1999
Environmental Auditor Training, QAS, Australia	1998

**PROFESSIONAL MEMBERSHIPS**

South African Council for Natural Scientific Professions, Professional Natural Scientist No: 400938/15	SACNASP
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Environmental Assessment Practitioners Association of South Africa      EAPASA  
Registration submitted – Reference number 2019/362

Approved Lead IEMA Tutor      -

### PROFESSIONAL EXPERIENCE

#### *Environmental and Social Impact Assessments – Energy Sector*

- ESIA for the proposed Kajiado 40MW Solar PV and Transmission Line Development in Kajiado State in Kenya. Current. Project Manager. Client: Themis Energy.
- Mozambique – Zambia Interconnector Powerline (2018): Project Manager. This project involved the compilation of the Environmental and Social Impact Assessment and Environmental and Social Management Plan for a 300km 400kV powerline between Tete, in Mozambique, and Chipata, in Zambia. Current. Client: Southern African Power Pool (SAPP).
- ESIA Upgrade to IFC Performance Standards requirements for the proposed Cuamba Solar PV Facility, Mozambique. Current. Project Director. Client: Globeleq.
- Part 2 Amendment Application for the Environmental Authorisation issued for the Maralla East and West Wind Energy Projects. 2019. Project Director. Client: Biotherm.
- Part 2 Amendment Application for the Rietkloof Wind Energy Facility Project (Indyebo) (2018): Project Director. Compilation of An Amendment Report and amended Environmental Management Programme for a 140MW Wind Energy Facility, Matjiesfontein, Western Cape. 2019. Client: G7 Renewable Energies.
- Basic Assessment for the proposed development of a PV Facility on Robben Island, Western Cape (2017). Project Manager. Client: National Department of Tourism.

#### *Environmental and Social Impact Assessments – Waste Sector*

- Scoping and Environmental Impact Assessment process for the proposed expansion of the Athlone Refuse Transfer Station, Western Cape (Current). Project Director. Client: City of Cape Town.
- Scoping and EIA for the proposed development of a nutrient recycling facility in Wadeville, Gauteng Province. Client: AgriProtein Gauteng.
- Basic Assessment for Waste Management License for decommissioning of HT Stills at FFS Vissershok refinery, Western Cape. Project Director: Decommissioning of the HT Stills distillation columns at the Vissershok refinery. Client: FFS Refiners (Pty) Ltd (Pty) Ltd.
- Waste Management License for the development of a solvent recovery plant, Kuilsrivier, Western Cape (Current). Project Director: EAP & Waste Management License (WML) required for the recovery plant. Client: Dekro Paints Pty Ltd.
- S&EIA for a Waste Management License, Atlantis, Western Cape for the production of automotive castings for both the passenger and commercial vehicle industries, and machines cylinder blocks and crankshafts. The process involves use of scrap steel. Client: Atlantis Foundries (Pty) Ltd.
- Part 8 Application for a Remediation Order to remediate the Vulindlela site, Port Elizabeth Harbour, Eastern Cape, South Africa (2014-2015). Client: Transnet National Ports Authority (TNPA).
- Basic Assessment and the development of a remediation plan for a Waste Management License for the Vulindlela site for Transnet Port Authorities in Port Elizabeth. Client: Transnet National Ports Authority (TNPA).
- Scoping and EIA process for WML for Landfill Gas to Energy projects for three City of Cape Town Landfill sites (Bellville South, Coastal Park and Vissershok). (2013-2014) Client: City of Cape Town.



- Basic Assessment process for the proposed Development of an Insect Based Protein Manufacturing Facility, Cape Town, Western Cape, South Africa (2013-2015): Client: AgriProtein Technologies.
- Basic Assessment for the proposed Sewage Package Plant on Robben Island, Cape Town, South Africa (2013-2015): Client: Department of Public Works.
- WML amendment application for the Uitenhage Waste Recovery Facility Proposed New Waste Stream, Uitenhage, Eastern Cape, South Africa (2011): Veolia Environmental Services (Pty) Ltd.

*Environmental and Social Impact Assessments – Agricultural Sector*

- Environmental and Scoping Impact Assessment to African World Bank Standards for large scale proposed Agro-Industrial Parks in four different regions across Ethiopia. The project proponent was the Ministry of Industry and UNIDO. Project Manager. Client: UNOPS.
- Environmental Impact Assessment process for the construction of a dam with a wall height exceeding 5m. In addition, progress the Water Use License Amendment Application for the agri-industrial activities being undertaken at the Lebombo Cape Site in Wellington, Cape Town. Project Manager. Client: Lebombo Cape Properties.

*Environmental and Social Impact Assessments – Urban Redevelopment*

- Management Consulting services to facilitate the development of a solution for Orion Engineered Carbons (Pty) Ltd. (OEC) within the Coega SEZ. OEC currently receives Carbon Black Oil (CBO) (a type of Heavy Fuel Oil or HFO) at the Dom Pedro facility at the Port of Port Elizabeth, this facility will cease operations in 2020 and an alternative solution is required. Project Manager. Client: Orion Engineered Carbons (Pty) Ltd.
- Part 2 Amendment Application for a proposed bulk petrochemical fuel storage facility in Zone 7 of the Coega SEZ. Project Manager. Client: Bay Terminals Group (Pty) Ltd
- Scoping and Environmental Impact Assessment process for the proposed redevelopment of the Athlone Power Station, Western Cape (2018). Project Director. Client: City of Cape Town.
- Develop an Operational Environmental Management Plan for Transnet Port Terminals Saldanha Multipurpose Terminal, Saldanha
- Basic Assessment process for an EA and AEL for a proposed Cement Packaging Facility at the FPT facility at the Cape Town Harbour, Western Cape. Project Director. Client: OSHO SA Cement (PTY) Ltd.
- Basic Assessment process for an EA and AEL for a proposed metal spay booth within a facility, which produces wind towers. Client: GRI Wind Steel (Pty) Ltd.
- Basic Assessment for the proposed upgrade to the sewerage system that runs along the beach front in Gordon's Bay. Client: City of Cape Town Water and Sanitation
- Section 24G application, Gauteng, South Africa (2013): Project Manager. Jacqui completed the Section 24G application form and facilitated client meetings as well as meetings with the National Department of Environmental Affairs to facilitate the application process. Following a legislation change in November 2013 this application was closed. Client: Aspen Pharmaceuticals.
- Water Use Licence Application process for two quarry sites in Western Cape. Client: AfriSam South Africa (Pty) Ltd.
- Feasibility studies conducted for Orion Engineered Carbons (Pty) Ltd for a number of project solutions for the proposed import of Carbon Black Oil into South Africa. Projects investigated included a Single Bouy Mooring, a subterranean pipelines from the Port Elizabeth Port and the Ngqura Port, a river and barge solution, and a tank farm at Coega Strategic Economic. Project Manager. Client: Orion Engineered Carbons (Pty) Ltd.

- Basic Assessment for the proposed consolidation and expansion of bulk storage and provision of hazardous substance storage capacity at a site in Epping to, Epping 1 Industria, Cape Town, South Africa (2013-2015): Client: Fine Chemicals Corporation (Pty) Ltd (Pty) Ltd.
- Basic Assessment for the expansion of the FFS Bulk Storage Facility at the Cape Town Harbour, Cape Town, South Africa (2013-2015): Client: FFS Refiners (Pty) Ltd.
- Scoping and EIA for the proposed biodiesel refinery in the Coega Industrial Development Zone (IDZ). Client: FIS Biofuels (Ltd).
- Basic Assessment for the proposed stockpiling of ferrous material in the form of Heavy Metal Steel (HMS) 1 & 2 as well as shredded material not exceeding a tonnage capacity of 22500 Tons at the K/L berth, Cape Town Harbour. Client: New Reclamation Group.
- Basic Assessment process for the redevelopment of Berths B, C and D at Duncan Dock at the Port of Cape Town. Fresh Produce Terminal, Cape Town Harbour, Cape Town, South Africa (2012-2013). Client: Fresh Produce Terminal (FPT).
- Basic Assessment for the reconstruction of the Blue Stone Quarry wall at a World Heritage Site on Robben Island, Cape Town, South Africa (2011-2015): Client: Department of Public Works.
- Scoping and EIA for the proposed Eerstelingsfontein Open Cast Coal Mine, near Belfast, Mpumalanga, South Africa (2011-2013): Project Manager. Client: Exxaro Coal Mpumalanga (Pty) Ltd.
- Basic Assessment for the Expansion of a Storage Tank Facility, Cape Town Harbour, South Africa (2010-2012): Client: FFS Refiners (Pty) Ltd.
- Basic Assessment for the Vodacom Diesel Tank Storage Installation, Bellville, Western Cape, South Africa (2010-2011): Client: Vodacom.
- Environmental Assessment of FFS Vissershok Facility, Cape Town, Western Cape, South Africa (2010-2011): Client: FFS Refiners (Pty) Ltd.
- EIA for the proposed Elizabeth House mixed use Development, Waterloo, London, United Kingdom (2007-2009): Client: Chelsfield and London and Regional Properties.
- EIA for the proposed mixed use development at 100 Middlesex Street, Tower Hamlets, London, United Kingdom (2007-2008): Client: Blackstone Group and Generation Estates.
- EIA for the proposed Ritz Extension, Westminster, London, United Kingdom (2006): Client: The Ritz
- EIA for the proposed mixed use Park House Development, Oxford, Westminster, London, United Kingdom (2005-2006): Client: Land Securities.
- EIA for the proposed Westbourne Park Bus Garage Extension, London, United Kingdom (2004-2004): Client: Westminster City Council.
- EIA for the proposed Greenheath Business Centre, London, United Kingdom (2004-2006): Client: Emblem Homes & Workspace Group Plc.
- EIA for the proposed Westminster Academy, London, United Kingdom (2003-2004): Client: Westminster City Council.
- Feasibility Study for the proposed new Thames Bridge, London, United Kingdom (2003): Client: London Borough of Hammersmith & Fulham.
- EIA for the proposed Oriental City Redevelopment, London, United Kingdom (2002-2011): Client: Plandex Properties Ltd.
- EIA for the proposed St Albans Farm light industrial site, United Kingdom (2002-2003): Client: Hunston Properties.
- EIA for the proposed SuperCAM rapid guided bus system, United Kingdom (2002-20013): Client: Gallagher's Estate.

- EIA for the proposed Pembury Hospital Redevelopment, United Kingdom (2001-2003): Co-ordinator. Client: Pembury Hospital.

*ESIA Due Diligence*

- Contributed to the technical Due Diligence on the Environmental and Social components of Phase 2 of the proposed Lesotho Highlands Project. Client: LHDA
- Gap Analyses – WSP acted as the Environmental Advisor in relation to the proposed investment in various solar PV projects located across Kenya. WSP undertook a fatal flaw analysis of the proposed projects against the IFC Performance Standards. Client: Themis
- ESDD - Gap analysis and update of an existing ESDD undertaken for a proposed Hotel in Addis Ababa, Ethiopia. PTA Bank were investigating co-financing the construction and operation of the hotel with Proparco. PTA Bank is committed to adhering to high standards of environmental and social governance when assessing finance project opportunities, as such the IFC Performance Standards (PS), 2012, were used as the benchmark for all lenders in the transaction. Compliance with host country regulations is a core requirement of the IFC Performance Standards and as such the Ethiopian national regulations were also considered. Client: HTi Consulting

*EIA Checklist*

- EIA applicability checklist for the proposed Tsogo Sun Hotel and Casino Development in Somerset West, Western Cape. Client: Tsogo Sun Hotels.
- EIA applicability checklist exercise to determine Environmental Authorisation requirements for the proposed waste water treatment facility, Cape Town, Western Cape, South Africa (2014): Client: Jetvac.
- EIA applicability checklist exercise to determine Environmental Authorisation, Cape Town, Western Cape, South Africa (2014): Client: FPT Group (Pty) Ltd.
- Various EIA Applicability Checklist projects, Cape Town, South Africa: Project Manager. Jacqui was the primary project deliverer for all these projects. Following a site visit and the collation of baseline information Jacqui has completed a number of EIA Checklists and drafted the necessary motivation letter to Department of Environmental Affairs and Development Planning. This has assisted proponents by providing formal opinion on the applicability of the EIA Regulations to their proposed development. Client: Various

*Public Consultation*

- Pex Foundry cc public consultation, Cape Town, South Africa (2014). WSP undertook the required PPP in terms of NEM: AQA, AEL applications. WSP compiled a formal comments and response report and submitted this to the license authority in support of the AEL application. Client: Pex Foundry cc.
- Protea Foundry public consultation, Cape Town, South Africa (2004). WSP undertook the required PPP in terms of NEM: AQA, AEL applications. WSP compiled a formal comments and response report and submitted this to the license authority in support of the AEL application. Client: Protea Foundry Brass Foundry cc.
- Protea Chemicals (Pty) Ltd public consultation, Port Elizabeth, Eastern Cape (2004). WSP undertook the required PPP in terms of NEM: AQA, AEL applications. WSP compiled a formal comments and response report and submitted this to the license authority in support of the AEL application. Client: Protea Chemicals (Pty) Ltd.

*Sustainability Assessments (SA) and Strategic Assessments*

- Developed a Sustainability Procurement Strategy for the Richards Bay Expansion Port Project. Client: Transnet (Pty) Ltd
- High-level feasibility study for a proposed development within a CBA, Cape town, Western Cape, South Africa (2014): Project Manager. WSP undertook technical specialist studies to determine the likely developable area and identify the potential of

fatal flaws for any proposed development. This process provided valuable information to the client body in understanding the developable potential of the site and the likely impacts associated with development. Client: Confidential.

- Environmental Input for Services Masterplan, Port of Saldanha, Western Cape, South Africa (2012-2013): Lead role. Advising WSPs Civil Engineering and external Planning team as to the environmental constraints associated with developing the remaining area within the port boundary at Saldanha in order to guide the development of the masterplan for future service provision. Client: Transnet National Ports Authority (TNPA).
- SA/SEA of Tunbridge Wells Local Development Framework, London, Tunbridge Wells, United Kingdom (2007-2008): Client: Tunbridge Wells Borough Council.
- SA - Ardersier, Scotland, United Kingdom (2007): Client: Whiteness Property Company Ltd.
- Nottingham East Side, Nottingham, United Kingdom (2005-2006): Client: Nottingham Regeneration Ltd.
- Ritz Hotel Extension, London, United Kingdom (2006): Client: The Ritz.
- International Conference Centre, Edinburgh, United Kingdom (2005): Client: CALA-AWG Ltd.
- Park House, Oxford Street, London, United Kingdom (2005-2006): Client: Land Securities.
- Napier Park, Luton, England, United Kingdom (2005): Client: Southside and City Developments.
- Thamesgate SEA, United Kingdom (2004-2005): Client: Thamesgate Group.
- Greenheath Business Centre Sustainability Appraisal, London, United Kingdom (2004): Client: Emblem Homes.
- Northern Bridge Office Sustainability Appraisal, London, United Kingdom (2004): Client: Berkeley Group.
- Highbury Quarter Scheme Sustainability Appraisal, London, United Kingdom (2004): Client: Allies and Morrison.
- Portsmouth Northern Quarter Redevelopment Sustainability Appraisal, United Kingdom (2004): Client: Centros.
- Sustainability Statement, London, United Kingdom (2003-2004): Sustainability Consultant. Client: Thornfield Properties Ltd.
- Bridgewater Place Sustainability Appraisal, London, United Kingdom (2003): Client: Landmark Development Projects and St James Securities.
- Minoco Wharf Sustainability Appraisal, London, United Kingdom (2003): Client: Ballymore Group.
- Oriental City Sustainability Appraisal, London, United Kingdom (2003): Client: Plandex Properties Ltd.
- Apache Helicopter Training programme Sustainability Appraisal, United Kingdom (2003): Client: Ministry of Defence.
- Chongming Island Masterplan Development Competition, United Kingdom (2003): Client: Skidmore, Owings & Merrill LLP (SOM).
- OMEGA phased mixed use development over 30 years, Sustainability Appraisal, United Kingdom (2003): Client: Northwest Regional Development Agency.
- North Bersted Sustainability Appraisal for the proposed North Bersted development in Bognor Regis, West Sussex., United Kingdom (2003): Client: Jointly commissioned by Cluttons (on behalf of the Church Commissioners) and Berkeley Community Villages.

- Pitwines Sustainability Statement for the development of 534 dwellings (affordable and private) on an area of land formally used as gaswork, United Kingdom (2003): Client: Crest Nicholson Residential (South) Ltd.
- Sustainability Statement for the proposed replacement of two small roundabouts on the A327 with a single, signalised, gyratory system., Wokingham District Council (2003): Client: Wokingham District Council.
- Metropolis House Redevelopment, London, United Kingdom (2003): Client: Metropolis Group
- Sustainability Advisor: Blackfriars Station Project, London, United Kingdom (2002): Sustainability Consultant. The Blackfriars Station scheme included the re-modelling of the track layout in order to provide two new through Thameslink rail lines to the east and two new terminating tracks to the west. Client: Thameslink 2000.
- Fitzrovia Redevelopment Project, London, United Kingdom (2002): Client: Ove Arup.
- Lee Valley National Athletics Stadium, United Kingdom (2001-2002): Sustainability Consultant. SPeAR® was used at concept design for the Athletics Stadium to be located at Pickett's Lock, Enfield. The SPeAR® diagram formed part of the Environmental Assessment Process and will be submitted with the EIA in support of the Planning Application. Client: Lee Valley Park Authority.
- Stanhope's Proposed New Complex Development, London, United Kingdom (2001): Sustainability Consultant. SPeAR® was used to assess the design for a business park of between 500,000 and 700,000 sq ft. to the east of Hemel Hempstead town centre. The SPeAR® appraisal was used to assess the concept design to ensure that the central theme of sustainability is maintained. Client: Stanhope.

*Environmental Management Plans (EMP's)*

- Environmental Management Plan (EMP) for the proposed redevelopment of the Berths at the FPT facility at the Cape Town Harbour. FPT proposed Berth B, C and D redevelopment, Cape Town Harbour, Western Cape, South Africa (2015): Client: FPT Group Pty Ltd.
- Environmental Management Programme, Port of East London, Eastern Cape, South Africa (2013): Client: New Reclamation Group.
- Environmental Management Programme, Mossel Bay, Western Cape, South Africa (2011-2013): Client: PetroSA.
- Faure Waste Disposal Site Closure, Cape Town, Western Cape, South Africa (2008-2009): Client: WSP SA Civil and Structural Engineers.
- Gordon's Bay Waste Disposal Site Closure, Cape Town, Western Cape, South Africa (2008-2009): WSP SA Civil and Structural Engineers (Pty) Ltd.
- Swartklip Waste Disposal Site Closure, Cape Town, Western Cape, South Africa (2011-2014): Client: WSP SA Civil and Structural Engineers (Pty) Ltd.
- Watermark Place, City of London, United Kingdom (2009): Project Director. EMP of the demolition and construction of the prominent Mondial House in the City of London on the north bank of the River Thames. Client: City Offices and UBS Global Asset Management.
- Park House, Oxford Street, Westminster, London, United Kingdom (2008): Project Director. EMP of the demolition and construction of the derelict office block and UCL Goldsmid Building on the south side of the Oxford Street. Client: Land Securities.
- Towards a Sustainable London: Reducing the Capital's Ecological Footprint – Phase 1 and Phase 2, United Kingdom (2005): Client: London Remade.
- Towards a Sustainable London: Reducing the Capital's Ecological Footprint – Case Study 1 Convoys Wharf, United Kingdom (2005): Client: London Remade.

*Auditing*

- Sasol Environmental Authorisations and Environmental Management Plans for the Sasol Franchise Operations (2019): Lead Auditor. Environmental compliance audits for Modderdam Road and Erica Road Facilities. Client: Sasol
- FFS Brackenfell, ROSE Foundation Compliance Audit, Cape Town, Western Cape, South Africa (2015): Client: FFS Refiners (Pty) Ltd.
- FFS Vissershok, ROSE Foundation Compliance Audit, Cape Town, South Africa (2015): Project Manager. Client: FFS Refiners (Pty) Ltd.

*Environmental Compliance Audits*

- ECO for the repair of the Landdroskop Jeep Track in Hottentots Holland Nature Reserve, Western Cape, South Africa (2018): Client: CapeNature.
- ECO for the construction of the Saldanha IDZ oil and gas offshore service complex, Western Cape, South Africa (2018-2019): Client: Saldanha Bay IDZ
- ECO for the construction of the demonstration desalination plant located adjacent to the eThekweni Municipality Central Waste Water Treatment Works (CWWTW) at the Durban Bluff 92018-2019): Hitachi Limited
- Environmental Compliance Audit for the existing Permosal facility located within Montague Gardens, Cape Town, Western Cape. Project Manager. Client: Permosal.
- ECO for the repair of the Landdroskop Jeep Track in Hottentots Holland Nature Reserve, Western Cape, South Africa (2014): Client: CapeNature.
- ECO for the expansion of the FFS Cape Town Harbour Storage Facility, Cape Town, South Africa (2013-2014): Client: FFS Refiners (Pty) Ltd.
- ECO for the FFS Vissershok Construction of the De-Ash plant, Cape Town, South Africa (2011-2013): Client: FFS Refiners (Pty) Ltd.
- ECO for the expansion of the FFS Cape Town Harbour Storage Facility, Cape Town, South Africa (2011-2012): Client: FFS Refiners (Pty) Ltd.
- ECO for the Swartklip Waste Disposal Site Closure, Cape Town, Western Cape, South Africa (2011-2014): Client: WSP SA Civil and Structural Engineers (Pty) Ltd.
- ECO for the Faure Waste Disposal Site Closure, Cape Town, Western Cape, South Africa (2008-2009): Project Manager. Client: WSP SA Civil and Structural Engineers (Pty) Ltd.
- ECO for the Gordon's Bay Waste Disposal Site Closure, Cape Town, Western Cape, South Africa (2008-2009): Client: WSP SA Civil and Structural Engineers (Pty) Ltd.
- Various construction projects, London, United Kingdom (2004-2007): Environmental Control Officer (ECO). Jacqui oversaw and managed over 10 ECO projects located within London. These were related to mixed use developments being constructed within a highly urbanised environment where noise and dust emissions were key issues being monitored by the Environmental Health Officers at the relevant Boroughs. Client: Various.

*Masterplanning and Feasibility*

- Beach View Screening, Cape Town, Western Cape, South Africa (2014): Project Manager. This screening assessment assisted in the determination of the key baseline characteristics of the site in relation to ecology, planning, accessibility, heritage and the ocean and dune dynamics. Client: Confidential.
- Signal Hill People Mover, Cape Town, Western Cape, South Africa (2014-2015): Project Director. SANParks engaged WSP Civil Engineers to establish the feasibility of developing a "people mover" system to transport people from the Strand Street Quarry in Cape Town to the summit of Signal Hill located in the Table Mountain National Park. Client: SANParks.



- Environmental Input for Services Masterplan, Port of Saldanha, Western Cape, South Africa (2012-2013): Client: Transnet National Ports Authority (TNPA).
- Feasibility Study of four proposed options being considered for the transfer of carbon black oil being imported and arriving by ship cargo, transferring this to land and delivering this product to a site within Nelson Mandela Bay. Client: Orion Engineered Carbons Pty Ltd.
- Site selection process for the proposed development of an Insect Based Protein Manufacturing Facility, Cape Town, Western Cape, South Africa (2013-2014): Client: AgriProtein Technologies.
- Spatial Planning and Urban Design Branch, Du Noon Contextual Framework, Mapping and Land Audit Study, Cape Town, Western Cape, South Africa (2013): Client: City of Cape Town.

*Waste*

- Waste Management Plan, Cape Town, Western Cape, South Africa (2014): Project Director. Indigo Brands are a leading cosmetics manufacturing company. WSP were approached by Indigo brands to develop a Waste Management Plan for the Epping manufacturing facility in Cape Town. Client: Indigo Brands.
- Industry Waste Management Plan (IWMP), Cape Town, Western Cape, South Africa (2013): Client: Fine Chemicals Corporation (Pty) Ltd.