

Environmental Impact Assessment (EIA) for the proposed construction,  
operation and decommissioning of the Saldanha Regional Marine Outfall  
Project of Frontier Saldanha Utilities (Pty) Ltd. at Danger Bay  
in the Saldanha Bay region

# VOLUME I

## FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT



April 2015

CSIR Report No:  
CSIR/CAS/EMS/ER/2014/0018/B





# REPORT DETAILS

<b>Title:</b>	<b>Environmental Impact Assessment (EIA) for the Proposed Construction, Operation and Decommissioning of the Saldanha Regional Marine Outfall Project for Frontier Saldanha Utilities (Pty) Ltd at Danger Bay in the Saldanha Bay Region, Western Cape: FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT</b>
<b>Purpose of this report:</b>	<p>This Final Environmental Impact Assessment Report (FEIAR) forms part of a series of reports and information sources that are being provided during the EIA process for the proposed Saldanha Regional Marine Outfall (SRMO) Project in Danger Bay in the Saldanha Bay Region, Western Cape. In accordance with the EIA Regulations and associated environmental licences, the purpose of the EIA Report is to <i>inter alia</i>:</p> <ul style="list-style-type: none"> <li>• Present the proposed project, including project alternatives and the need for the project;</li> <li>• Describe the affected environment, including the planning context, at a sufficient level of detail to facilitate informed decision making;</li> <li>• Provide an overview of the EIA process being followed, including public consultation;</li> <li>• Assess the predicted positive and negative impacts of the project on the environment;</li> <li>• Provide recommendations to avoid or mitigate negative impacts and to enhance the positive benefits of the project;</li> <li>• Provide the necessary information to the authorities to inform decision-making on associated environmental licences and permits (e.g. for marine discharge); and</li> <li>• Provide a draft Environmental Management Programme (EMP) for the design, construction and operational phases of the project.</li> </ul> <p><b>The FEIAR and EMP are being made available to all stakeholders for a 30-day review period. All comments on the FEIAR and EMP are to be submitted to Shawn Johnston of Sustainable Futures ZA.</b></p> <p><i>Contact details:</i>  Email: swjohnston@mweb.co.za  Cell: 083 325 9965  Address: PO Box 749, Rondebosch, Cape Town, 7701</p> <p>The FEIAR, draft EMP and comments on these following the 30-day review period, will be submitted to the Provincial Department of Environmental Affairs and Development Planning (DEA&amp;DP) for decision-making.</p>

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<b>DEA&amp;DP Ref Number:</b>	Western Cape Department of Environmental Affairs and Development Planning (DEA&DP): DEA&DP EIA Reference number: 16/3/1/2/F4/17/3009/13
<b>DEA: Oceans and Coasts Reference Number:</b>	2014/016/Frontier Saldanha
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## **WHAT IS NEW IN THE FINAL EIA REPORT?**

This section provides an overview of the changes made to the Saldanha Regional Marine Outfall Project Final EIA Report (April 2015) since the publishing of the Draft EIA Report (October 2014).

For ease of reference, **any significant changes/additions** made within the chapters from the Draft to the Final Environmental Impact Assessment Report are listed below:

<b>Summary</b>	The Summary has been updated to reflect the changes following the release of the Draft EIA Report as indicated below. It also includes this section on <i>“What is new in the Final EIA Report?”</i>
<b>Volume I, Section A</b>	<b>FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT</b>
Chapter 1	<p><b>Section 1.4.2 on pipeline routing alternatives was updated.</b> It includes the following sections:</p> <ul style="list-style-type: none"> <li>• Background to the West Coast District Municipality Desalination Plant Application;</li> <li>• Further negotiation on Erf 299;</li> <li>• Discussion around botanical offsets; and</li> <li>• Recommendations by the Environmental Assessment Practitioner.</li> </ul> <p>Section 1.4.2 (section on further negotiation on Erf 299) provides motivation why the Jacobsbaai Eastern Corridor is not a feasible alternative and why the Jacobsbaai Western Corridor was selected as the preferred pipeline routing alternative. This is based on letters of objection received from Mr Smit of Forellendam (Pty) Ltd and Afrisam regarding the proposed servitude over their properties (for the Eastern Corridor). The section on botanical offsets states that Frontier Saldanha Utilities is willing to enter into an agreement with CapeNature or another relevant authority or institution (e.g. WWF) to provide an offset in the form of a financial contribution for the conservation and management of valuable land parcels as identified by CapeNature or another authority or institution. It is the opinion of the EAP that this type of offset is appropriate considering the nature and the scale of the proposed development. It is recommended that it is not necessary for Frontier Saldanha Utilities to conduct a separate botanical offset study, and motivation to this effect is provided. Recommendations are provided by the Environmental Assessment Practitioner in terms of the preferred routing alternative (i.e. the Jacobsbaai Western Corridor) and the need for Frontier Saldanha Utilities to provide a financial offset instead of conducting a separate offset study. It is recommended that a plant rehabilitation programme, including a Search &amp; Rescue Programme (S&amp;R), should be undertaken by Frontier Saldanha Utilities as recommend by Mr Nick Helme in his Ecological specialist study (Appendix B of Volume II of this report). It is recommended that for the section pipeline of approximately 2 000 m traversing through an area with endangered vegetation (within and to the south of Jacobsbaai), the pipeline construction disturbance footprint should be entirely within the road reserve west of the main road, to reduce impacts on sensitive vegetation along the pipeline corridor. Most of the Species of Special Concern are</p>

	<p>located east of the main road, or outside of the road reserve. This recommendation has been accepted by Frontier Saldanha Utilities.</p> <p>It is further recommended that for the section pipeline of approximately 2 000 m traversing through an area with endangered vegetation (within and to the south of Jacobsbaai) the proposed pipeline must be buried on the western (seaward) side of the road as this side is more disturbed and hence less sensitive than the eastern side.</p> <p><b>Section 1.5 on Need and Desirability has been updated</b>, specifically Section 1.5.5 on the “Role of the Saldanha Regional Marine Outfall Project for wider projects in the Saldanha Industrial Development Zone.” The section refers to letters of support which were received from the following entities:</p> <ul style="list-style-type: none"> <li>• Letter from Saldanha Bay Municipality (SBM) dated 10 February 2015. The SBM acknowledged that the project will contribute to the development of the Greater Saldanha industrial and commercial areas. It would be a pre-requisite for the proposed regional WWTW by the SBM that will further assist the development of the SBM Industrial Development Area. The project is seen as vital to ensure economic growth for Saldanha Bay and the surrounding area.</li> <li>• Letter from Saldanha Bay Water Quality Forum Trust (SBWQFT) dated 23 February 2015. This SBWQFT provides support since the project can alleviate future effluent disposal requirements within the Saldanha small bay area.</li> <li>• Letter from ArcelorMittal dated 19 February 2015. ArcelorMittal supports the proposed project as it “could trigger an environmental solution for future development in the area.”</li> </ul> <p><b>Section 1.6 on the Requirements for an Environmental Impact Assessment has been updated.</b> The listed activities triggered under the 2010 NEMA EIA Regulations have been updated (Table 1.4). Table 1.5 has been added, which contains a list of activities which are triggered under the new 2014 NEMA EIA Regulations. Table 1.5 also shows the corresponding listed activities triggered under the 2010 NEMA EIA Regulations.</p>
Chapter 2	Chapter 2 has been updated to include motivation why the Jacobsbaai Eastern Corridor is not a viable alternative due to letters of objection received from Mr Smit of Forellendam (Pty) Ltd and Afrisam for the pipeline to cross their properties. It states that the Jacobsbaai Western Corridor is the only feasible pipeline routing alternative that should be considered by DEA&DP.
Chapter 4	The chapter on the relevant legislation has been updated. Chapter 4 refers to the updated list of listed activities under the 2010 NEMA EIA Regulations included in Table 1.4 in Chapter 1. It also refers to Table 1.5 of Chapter 1 which contains a list of activities which are triggered under the 2014 NEMA EIA Regulations.
Chapter 5	The chapter on the Approach to the EIA and Public Consultation has been updated following the release of the Draft EIA Report.



Chapter 6	The Issues and Responses Trail has been updated to include the comments received after the release of the Draft EIA Report and the responses thereto.
Chapter 7	The chapter has been updated to include the details of the Public Participation Process followed since the release of the Draft EIA Report.
Chapter 8	The chapter on the Environmental Impact Assessment has been updated to reflect the updates in the pipeline corridor and project footprint, and the associated impact assessment ratings by Nick Helme in his Ecological specialist study. This follows the recommendation by Nick Helme in his study that Frontier Saldanha Utilities should provide a financial contribution to an appropriate biodiversity offset. The recommendation states that the applicant must engage with CapeNature (or another appropriate conservation body) and an experienced biodiversity offset advisor prior to the project being executed, in order to formalise the form and quantum of a biodiversity offset, as an important element of mitigation for degradation of Limestone Strandveld habitat in the Jacobsbaai area.
Chapter 9	<p>The Conclusions chapter have been updated to reflect the latest changes since the release of the Draft EIA Report as discussed above. This includes motivation why the Jacobsbaai Eastern Corridor is not a viable alternative following letters of objection from Mr Smit of Forellendam (Pty) Ltd and Afrisam for the pipeline to cross their properties. It also includes a section on botanical offsets. It states that Frontier Saldanha Utilities is willing to enter into an agreement with CapeNature or another relevant authority or institution (e.g. WWF) to provide an offset in the form of a financial contribution for the conservation and management of valuable land parcels as identified by CapeNature or another authority or institution. It is the opinion of the EAP that this type of offset is appropriate considering the nature and the scale of the proposed development. It is recommended that it is not necessary for Frontier Saldanha Utilities to conduct a separate botanical offset study, and provides motivation to this effect. Chapter 9 provides recommendations by the Environmental Assessment Practitioner in terms of the preferred routing alternative and the need for Frontier Utilities to provide a financial offset instead of conducting a separate offset study. The recommendation states that the applicant must engage with CapeNature (or another appropriate conservation body) and an experienced biodiversity offset advisor prior to the project being executed, in order to formalise the form and quantum of a biodiversity offset, as an important element of mitigation for degradation of Limestone Strandveld habitat in the Jacobsbaai area.</p> <p>It is recommended that a plant rehabilitation programme, including a Search &amp; Rescue Programme (S&amp;R), should be undertaken by Frontier Saldanha Utilities as recommend by Mr Nick Helme in his Ecological specialist study. It is further recommended that for the section pipeline of approximately 2 000 m traversing through an area with endangered vegetation (within and to the south of Jacobsbaai), the pipeline construction disturbance footprint should be entirely within the road reserve west of the main road, to reduce impacts on sensitive vegetation along the pipeline corridor. Most of the Species of Special Concern are located east of the main road, or outside of the road reserve. This recommendation has been accepted by Frontier Saldanha Utilities.</p>
Volume I,	<b>ENVIRONMENTAL MANAGEMENT PROGRAMME</b>

<b>Section B</b>	
EMPR	The EMPR has been updated (Section B of Volume I of the FEIAR) following the revision of the Ecological Specialist study and the comments received after the release of the Draft EIA Report. It includes <i>inter alia</i> , recommendations by the botanist, Nick Helme of <i>Nick Helme Botanical Surveys</i> , to include a detailed Plant rehabilitation Programme (including S&R). Recommendations from Heritage Western Cape included in their letter of approval dated 10 December 2014 are also included.
<b>Volume I Appendices</b>	<b>APPENDICES</b>
Appendix B	The following letters have been added to Appendix B after the release of the Draft EIA Report.
Appendix B2(i)	Letter from Frontier Saldanha Utilities (Pty) Ltd to Forellendam (Pty) Ltd to register a servitude over their property (letter dated 25 February 2015)
Appendix B2(ii)	Letter of objection from Forellendam (Pty) Ltd regarding the proposed servitude over their property (including the letter of approval from the Saldanha Bay Municipality for development rights on Erf 299) (letter dated 18 March 2015)
Appendix B3	Letter of objection from Afrisam regarding the proposed servitude over their property (letter dated 9 February 2015)
Appendix B6	Letter from Saldanha Bay Municipality in support of the SRMO Project (letter dated 10 February 2015)
Appendix B7	Letter from Saldanha Bay Water Quality Forum Trust in support of the SRMO Project (letter dated 23 February 2015)
Appendix B8	Letter from ArcelorMittal in support of the SRMO Project (letter dated 19 February 2015)
Appendix E1	The advertisement placed in the <i>Weslander</i> on 23 October 2014 is included. The advertisement was to inform the public of the release of the Draft EIA Report for comment and to provide details on the Public Open House.
Appendix E3	Notices to Interested and Affected Parties including email correspondence following the release of the Draft EIA Report are included.
Appendix G	Correspondence received from Interested and Affected Parties (including Authorities) following the release of the Draft EIA Report are included.
Appendix H	Details regarding the second Public Open House held at the Blue Water Bay Lodge in Saldanha Bay on 13 November 2014 following the release of the Draft EIA Report are included. It includes the attendance register and the notes of the Public Open House (Appendix H1).
Appendix I	Details regarding the Focus Group Meetings following the release of the Draft EIA Report have been included. The attendance registers and the minutes of the Focus Group Meetings are included in Appendix I1. Representatives of Frontier, CSIR and

	<p>Shawn Johnston of Sustainable Futures attended the following Focus Group Meetings:</p> <ul style="list-style-type: none"> <li>• Focus Group Meeting with Jacobsbaai Sea Products on 30 October 2014;</li> <li>• Focus Group Meeting with Jacobsbaai Residents and Ratepayers Association on 30 October 2014;</li> <li>• Focus Group Meeting with Saldanha Bay Municipality on 13 November 2014;</li> <li>• Focus Group Meeting with Tabakbaai Ward Councillor and Ward Committee on 13 November 2014;</li> <li>• Focus Group Meeting with Department of Environmental Affairs and Development Planning (DEA&amp;DP), CapeNature, Mr Nick Helme of <i>Nick Helme Botanical Surveys</i> on 12 March 2015.</li> </ul>
<b>Volume II</b>	<b>SPECIALIST STUDIES</b>
Appendix B	The Ecological Study has been updated to include the recommendation to provide a financial offset as discussed at the meeting with DEA&DP and CapeNature on 12 March 2015. The recommendation states that the applicant must engage with CapeNature (or another appropriate conservation body) and an experienced biodiversity offset advisor prior to the project being executed, in order to formalise the form and quantum of a biodiversity offset, as an important element of mitigation for degradation of Limestone Strandveld habitat in the Jacobsbaai area.
<b>Volume III</b>	<b>SUPPORTING TECHNICAL STUDIES</b>
Volume III Annexure 5	The Water Use Licence Application prepared by AGES Gauteng for the Department of Water Affairs and Sanitation has been included.

# GLOSSARY

<b>ACO</b>	Archaeology Contracts Office
<b>BA</b>	Basic Assessment
<b>BID</b>	Background Information Document
<b>CAH</b>	Chlor-Alkali Holdings Pty (Ltd)
<b>CAPF</b>	Chlor-Alkali Production Facility
<b>CARA</b>	Conservation of Agricultural Resources Act
<b>CBA</b>	Critical Biodiversity Area
<b>CFR</b>	Cape Floristic Region
<b>CREW</b>	Custodians for Rare and Endangered Wildflowers
<b>CSIR</b>	Council for Scientific and Industrial Research
<b>CWDP</b>	Coastal Waters Discharge Permit
<b>DEA</b>	National Department of Environmental Affairs
<b>DEA&amp;DP</b>	Department of Environmental Affairs and Development Planning
<b>DEIR</b>	Draft Environmental Impact Assessment Report
<b>DSR</b>	Draft Scoping Report
<b>DWA</b>	Department of Water Affairs
<b>DWS</b>	Department of Water Affairs and Sanitation
<b>EA</b>	Environmental Authorisation
<b>EAP</b>	Environmental Assessment Practitioner
<b>ESA</b>	Early Stone Age
<b>EIA</b>	Environmental Impact Assessment
<b>EMF</b>	Environmental Management Framework
<b>EMP</b>	Environmental Management Plan
<b>ESS</b>	Environmental Screening Study
<b>FEIAR</b>	Final Environmental Impact Assessment Report
<b>GI</b>	Gigalitre (1 000 000 000 litres or Mm <sup>3</sup> )
<b>Ha</b>	Hectares
<b>HOA</b>	Heads of Agreement
<b>I&amp;AP</b>	Interested and Affected Party
<b>ICM</b>	Integrated Coastal Management Act
<b>IDP</b>	Integrated Development Plan
<b>IDZ</b>	Industrial Development Zone
<b>IEM</b>	Integrated Environmental Management
<b>IPAP</b>	The Industrial Policy Action Plan
<b>Kl</b>	Kilolitres
<b>kWh</b>	Kilowatt Hours

<b>Mg/l</b>	Milligram per litre
<b>MI</b>	Megalitre (1 000 000 litres)
<b>MLRA</b>	Marine Living Resources Act
<b>MSA</b>	Middle Stone Age
<b>MSL</b>	Mean Sea Level
<b>MPA</b>	Marine Protected Area
<b>MV</b>	Medium Voltage
<b>NaOH</b>	Sodium Hydroxide
<b>NEMA</b>	National Environmental Management Act (No. 107 of 1998)
<b>NEMBA</b>	National Environmental Management Biodiversity Act (Act 10 of 2004)
<b>NFEPA</b>	National Freshwater Ecosystem Priority Areas
<b>NHRA</b>	The National Heritage Resources Act
<b>NID</b>	Notice of Intent to Develop
<b>NSDP</b>	National Spatial Development Perspective
<b>NWA</b>	National Water Act
<b>O&amp;C</b>	Oceans and Coasts
<b>OHL</b>	Overhead Lines
<b>PEA</b>	Preliminary Economic Assessment
<b>PICC</b>	Presidential Infrastructure Coordinating Commission
<b>PLC</b>	Programmable Logic Control
<b>PPP</b>	Public Participation Process
<b>PSDF</b>	Provincial Spatial Development Framework
<b>PSEIA</b>	Plan of Study for EIA
<b>PVC</b>	Poly Vinyl Chloride
<b>RE</b>	Rare Earths
<b>REE</b>	Rare Earth Element
<b>RHDHV</b>	Royal HaskoningDHV
<b>SABS</b>	South Africa Bureau of Standards
<b>SADC</b>	South African Development Community
<b>SANBI</b>	South African National Biodiversity Institute
<b>SBM</b>	Saldanha Bay Municipality
<b>SBS</b>	Sodium Bisulphite
<b>SBWQFT</b>	Saldanha Bay Water Quality Forum Trust
<b>SCC</b>	Species of Conservation Concern
<b>SDF</b>	Spatial Development Framework
<b>SEA</b>	Strategic Environmental Assessment
<b>SEZ</b>	Special Economic Zone

<b>SF</b>	Sustainable Futures
<b>SG</b>	Surveyor General
<b>SIPs</b>	Strategic Integrated Projects
<b>SRMO</b>	Saldanha Regional Marine Outfall
<b>SSP</b>	Saldanha Separation Plant
<b>ToR</b>	Terms of Reference
<b>UNEP</b>	United Nations Environmental Programme
<b>WCDM</b>	West Coast District Municipality
<b>WET</b>	Whole Effluent Toxicity
<b>WHO</b>	World Health Organisation
<b>WULA</b>	Water Use License Application
<b>WWTW</b>	Waste Water Treatment Works



# SUMMARY

## PROJECT INTRODUCTION

The Council for Scientific and Industrial Research (CSIR) has been appointed by Frontier Saldanha Utilities (Pty) Ltd (Frontier Utilities) as the independent Environmental Assessment Practitioner (EAP) to undertake the Environmental Impact Assessment (EIA) for the proposed construction, operation and decommissioning of a marine outfall pipeline and associated infrastructure in Danger Bay in the Saldanha Bay region. The EIA is undertaken in terms of the National Environmental Management Act (No. 107 of 1998) and its amended Regulations 543, 544, 545 and 546, as promulgated on 18 June 2010.

## PROJECT OVERVIEW

The proposed pipeline transfer system [referred to as the Saldanha Regional Marine Outfall (SRMO) Project] will discharge approximately 8 - 9 Mega litres per day (Ml/day) of treated industrial effluent generated from the following three sources into Danger Bay (refer to **Figure S1**):

- a Rare Earth Element (REE) Separation Plant [referred to as the Saldanha Separation Plant (SSP)] proposed by Frontier Separation Pty (Ltd) (EIA undertaken by AGES, Environmental Decision pending; Application Ref No. 16/3/1/2/F4/17/3004/13);
- a Chlor-Alkali Production Facility (CAPF) proposed by Chlor-Alkali Holdings Pty (Ltd) (CAH) (EIA in progress undertaken by MEGA, Application Ref No. 16/3/1/2/F4/17/3053/12); and
- a regional Waste Water Treatment Works (WWTW) proposed by the Saldanha Bay Municipality (SBM) (EIA not yet commissioned).

**Table S1: Proposed effluent streams**

Proposed effluent stream *	RHDHV PREFEASIBILITY DESIGN			
		UNITS		UNITS
Saldanha Separation Plant	38.9	l/s	3.4	ML/day
Chlor Alkali Production Facility	2.2	l/s	0.2	ML/day
Regional Waste Water Treatment Works	57.9	l/s	5.0	ML/day
Other Industries	0	l/s	0	ML/day
<b>Total Flow rate</b>	<b>98.94</b>	<b>l/s</b>	<b>8.55</b>	<b>ML/day</b>

\*this excludes the effluent from the proposed West Coast District Municipality Desalination plant. However, this was modelled as part of the overall EIA.

The liquid effluent produced at the proposed facilities (SSP, CAPF and WWTW) will predominantly be brine i.e. a solution of sodium chloride (NaCl) in water, with trace levels of other elements. In the separation process, sodium hydroxide (NaOH) and hydrochloric acid (HCl) will be used for pH adjustment. These chemicals will be produced in an adjacent CAPF owned and operated by CAH. For a full breakdown of the effluent composition please refer to Chapter 2.

The dispersion of these three effluent streams in the marine environment was modelled either separately or as a combined stream; which was thereafter reviewed within the scope of the EIA process by the marine ecologist. Therefore, the following effluent streams and combinations thereof were modelled by WorleyParsons South Africa (Pty) Ltd (WorleyParsons):

1. The SSP effluent only at either outfall position 1 or 2 (**Figure S2**);
2. The combined SSP and CAPF effluent at either outfall position 1 or 2;

3. The combined SSP, CAPF and WWTW effluent at either outfall position 1 or 2;
4. The combined SSP, CAPF effluent and the effluent from the proposed West Coast District Municipality (WCDM) desalination plant via the WCDM desalination plant's brine return system (as explained below in Scenario 2); and
5. The combined SSP, CAPF, WWTW effluent and the effluent from the proposed WCDM desalination plant via the WCDM desalination plant's brine return system (as explained below in Scenario 2).

The Marine Hydrodynamic Modelling study is included as Annexure 2 of Volume III of this report. It is currently planned that the effluent will be disposed via the brine return disposal infrastructure of the proposed WCDM seawater reverse osmosis desalination plant, planned to be located at Danger Bay (EIA was undertaken by CSIR; Application Ref No. E12/2/4/2-F4/16-3037/11). The Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) granted Environmental Authorisation (EA) for the proposed desalination plant on 13 August 2013. The CSIR has lodged an application for an EA Amendment on 15 August 2014.

However, the possibility exists that the planned WCDM desalination plant might be delayed. Consequently, **this EIA for the proposed SRMO Project investigates an alternative sea disposal option for interim effluent disposal (Scenario 1)** until the WCDM desalination plant is commissioned (Scenario 2).

Should the pipeline for the WCDM desalination plant be constructed it is envisaged that one shared outfall pipeline will be utilised by the SRMO Project and the WCDM desalination plant in Danger Bay (it has been indicated by the national Department of Environmental Affairs: Oceans and Coasts (DEA:O&C), that it will not be permitted to have two marine outfalls located within Danger Bay due to cumulative

environmental impacts). To this effect a Heads of Agreement was signed on 20 November 2013 with the WCDM for co-disposal into Danger Bay using the brine return infrastructure of the proposed WCDM's desalination plant (Appendix B1 of Volume I of this report).

The pipeline design excluded the transfer and disposal of effluent by future operations other than from the proposed SSP, CAPF, WWTW and the WCDM desalination plant. It is envisaged that future disposal into the SRMO pipeline will be subjected to additional technical feasibility studies (*i.e.* effluent dispersion modelling), amendments, and new EAs that will be required for additional effluent outputs.

## PROJECT DESCRIPTION

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Frontier Utilities completed a Feasibility Study for the SRMO Project (Annexure 1 of Volume III of this report). The scope of work included the design of a terrestrial pipeline and transfer pump stations along the pipeline route to transfer treated industrial effluent from the proposed SSP, the CAPF and the regional WWTW to the proposed WCDM's sea water reverse osmosis desalination plant, planned to be located in Danger Bay near Saldanha.

It is proposed that the SRMO pipeline will follow to a large extent the same terrestrial corridor as that proposed for the proposed WCDM desalination plant potable water pipeline leading to the Besaanskop reservoir (Chapter 2).

The terrestrial pipeline will be approximately 27 km long from the SSP to the outfall in Danger Bay (**Figure S1**). The proposed pipeline will have a diameter of approximately 900 mm which will ensure there is sufficient capacity to allow additional industries to connect to it in future (these will conform to additional EAs not investigated as part of this EIA).

The pipe will most likely be constructed from high density polyethylene (HDPE) or will be a glass reinforced plastic (GRP) pipe. The proposed pipeline will be buried to minimize the risk of theft, vandalism and fire damage.

The marine outfall will be low pressure mains and constructed in accordance with SABS 1200. The marine pipeline will be either be laid on the seabed, weighted down by suitable weight collars or concrete coatings, or buried (depending on geotechnical conditions). The pipeline to the outfall will be buried through the surf and beach areas.

## **ASSOCIATED PIPELINE INFRASTRUCTURE**

### **Effluent storage tanks**

An effluent storage tank will be located at the sites of the SSP, CAPF and WWTW's facilities. It is proposed that all users allow for a minimum storage period of four hours on their respective sites.

The effluent storage tanks may require EA from the relevant competent authority, i.e. the DEA&DP. This EIA will not require EA for the storage tanks. Each party that intends to use the proposed SRMO pipeline (i.e. SSP, CAPF, WWTW and possibly other industries in future) will have to apply for a separate EA for the storage tanks on their respective sites.

### **Pump stations**

There are five pump stations with associated transfer tanks along the pipeline corridor (**Figure S1**). The pump stations will not be taller than 5 m. The following section provides a description of the pump stations:

- The transfer pump stations will be located within (or as close as possible) to the servitude or it will be located on a separate site that will require rezoning;
- the pump stations will be fenced off with double swing gates for access control;
- security measures (e.g. burglar proofing) will be installed to secure the pump station and a concrete roof will be constructed;
- the pump station will comprise of a concrete building;

- the pump stations will be remotely monitored and controlled via a centralized off site control room;
- a bunded storage facility will be provided and designed to accommodate the industrial effluent requirements (since separate EIAs will have to be performed each time a new industry utilises the facility, the EIA requirement may prescribe to update the Engineering Design during which time the size of the bunded area may change);
- access to the pump stations will be taken from secondary existing access road and where this is not possible, access will be taken directly from the provincial road TR85. The access roads will be gravel roads; and
- the access roads will be 5 m wide with turning radii of to allow maintenance vehicles entry and exit.

### **Pump station transfer tanks**

The pump station transfer tanks (comprising a volume of 15 m<sup>3</sup> each) will have a bunded wall to contain the maximum volume of storage during an emergency. The floor of the bunded area will be impermeable and will slope towards a sump, located in the bunded area, to allow for the emptying of the bunded area in case of an emergency.

An emergency overflow will also be constructed above the maximum water level in the transfer tank to provide for additional storage during emergencies. Instrumentation will be installed on each individual pipe, feeding the pump station transfer tanks from each participating industry, to measure certain key constituents as determined during the EIA. The final position and type of instrumentation to be used will be determined during the detailed design stage of the project.

### Auxiliary equipment

Provision will be made for one duty and one standby pump in the design of the SRMO Project. Variable speed drive pumps will be used to ensure optimal energy efficiency utilisation and to minimize water damage in the pipeline.

### Electrical supply and infrastructure

The supply of bulk electrical services to the different pump stations located at various positions along the proposed pipeline and electrical route also represent alternative options for the EIA assessment. Either Medium Voltage (MV) cabling — which will be buried depending on the width of the pipeline servitude — will be utilised, alternatively, Medium Overhead Lines (OHL) in traditional Delta A-Frame positions (wooden poles), at a height of 12 m, will be used.

## TERRESTRIAL PIPELINE ROUTING

A full description of the pipeline routing alternatives and the discussion on offsets is provided in Section 1.4.2 of Chapter 1. The section below provides a summary of Section 1.4.2.

### Background to the West Coast District Municipality Desalination Plant Application

In the FEIAR of the WCDM desalination plant, the 'Jacobsbaai Road Eastern Corridor' alternative was the preferred electrical and pipeline corridor for the development as it followed a sandy, disturbed trench (previously used for agriculture) that would circumnavigate sensitive limestone strandveld mosaics. This corridor was also included as the preferred pipeline routing option in the Draft Scoping Report of this SRMO EIA.

In the WCDM desalination plant EIA the 'Jacobsbaai Road Western Corridor' was determined to be a no-go area by the botanical specialist Nick Helme due to its botanical sensitivity, as it traverses a surface limestone

area which is known to support at least 12 threatened plant species.

Subsequent to the EA being issued for the WCDM desalination plant in August 2013, it was determined that certain land owners along the 'Jacobsbaai Road Eastern Corridor' were not amiable to negotiate the potential for registering a servitude over their properties.

Currently the 'Jacobsbaai Road Eastern Corridor' is the authorised corridor for the WCDM desalination plant. The CSIR lodged an application for an EA Amendment on 15 August 2014 with DEA&DP on behalf of WCDM for the proposed desalination pipeline. In this Amendment application, the '**Jacobsbaai Road Western Corridor**' was re-evaluated and was put forward as the preferred pipeline routing alternative as the '**Jacobsbaai Road Eastern Corridor**' has proven to be unfeasible.

### Further negotiations on Erf 299

Subsequent to lodging the Application for an EA Amendment for the WCDM Desalination Plant, Frontier Saldanha Utilities started negotiating with land owners along the Jacobsbaai Eastern Corridor to register a servitude. Frontier Saldanha Utilities issued a letter dated 25 February 2015 to Mr Smit to formally request Forellendam to indicate whether they would be amenable towards negotiations with regard to the registering of a proposed servitude over Erf 299 (see Appendix B2 (i) of this report). Mr Smit issued a letter of objection dated 18 March 2015 in response (see Appendix B2(ii)). Attached to the letter from Mr Smit is a letter from the SBM granting development rights for erven 299, 892 and 889, which also includes a layout plan (dated April 1994).

Following this interaction, the Jacobsbaai Eastern Corridor was identified as not being a viable alternative, and Frontier has reconsidered routing alternatives including the 'Afrisam' and 'Jacobsbaai Road Western' Corridors which were previously considered by the CSIR EIA project team during the WCDM desalination plant EIA.

Discussions between representatives of Frontier Saldanha Utilities and Afrisam revealed that Afrisam object to the pipeline crossing their property. Afrisam issued a letter of objection dated 9 February 2015 (see Appendix B3).

The Jacobsbaai Western Corridor was thus included as the preferred pipeline routing alternative in the Final Scoping Report and was assessed in the EIA phase of the SRMO Project (see Figure 1.1). The Jacobsbaai Western Corridor was assessed in the Terrestrial Ecological specialist study undertaken by Nick Helme for the SRMO Project (Appendix B of Volume II of this report). The study concluded that the Jacobsbaai Western Corridor will have a HIGH negative botanical impact without mitigation, which could be reduced to **MEDIUM negative with mitigation**. The required mitigation includes rerouting a portion of the route (from Pump station C to D) to the northern side of the Jacobsbaai Road, thereby avoiding sensitive wetland areas on the southern side of the Jacobsbaai Road. The HIGH negative botanical impact without mitigation could be reduced to **LOW to MEDIUM with a financial contribution to a biodiversity offset**. The Jacobsbaai Eastern Corridor will have a MEDIUM negative botanical impact, both before and after mitigation. Thus if rerouting of a portion of the Jacobsbaai Western Corridor is undertaken as mentioned above, and all mitigation is sufficiently implemented and executed, then there is no clear routing preference from a botanical perspective evident to the EAP.

The Jacobsbaai Western Corridor is the preferred alternative from a visual perspective since the pipeline will follow the existing road and will not open up a new corridor in the landscape.

#### Discussions around botanical offsets

Frontier Saldanha Utilities is willing to enter into an agreement with CapeNature or another relevant authority or institution (e.g. WWF) to provide an offset in the form of a financial contribution for the conservation and management of valuable land parcels as

identified by CapeNature or another authority or institution. This option was discussed at the meeting which was held at the offices of DEA&DP in Cape Town on 12 March 2015 with representatives of Frontier, DEA&DP, CapeNature, CSIR and the ecological specialist, Mr Nick Helme (see meeting notes and the attendance register included in Appendix I1). The purpose of the meeting was to discuss the challenges associated with the Jacobsbaai Eastern Corridor and to provide motivation why the Jacobsbaai Western Corridor has become the only viable corridor alternative.

It is the opinion of the EAP that the offset in the form of a financial contribution is appropriate considering the nature and the scale of the proposed development. It is recommended that it is not necessary for Frontier Saldanha Utilities to conduct a separate botanical offset study. Motivation to this effect is provided in Section 1.4.2 of Chapter 1 of this report.

#### NEED FOR AN EIA

In terms of the National Environmental Management Act (Act no. 107 of 1998), as amended (NEMA), and the 2010 EIA regulations published in Government Notice R 543, 544, 545 and 546 on the 18 June 2010 in Government Gazette 33306 (as amended), a Scoping and Environmental Impact Assessment Process is required as the project includes the following activities listed in the aforementioned regulations.

Table 1.4 of Chapter 1 of this report contains a complete list of activities contained in GN R544, 545 and 546, which may be triggered by the various project components and thus form part of this Scoping and EIA Process. These listed activities require authorisation from the relevant authority, which in this instance is the DEA&DP, and are listed below.

- Listing Notice 1: GN No. 544: 9, 11, 13, 14, 16, 17, 18, 22, 23, 24, 26, 39, 40, 46, 47
- Listing Notice 2: GN No. 545: 3, 5, 6, 14, 15, 24



- Listing Notice 3: GN No. 546: 4, 10, 12, 13, 16, 19, 24

In addition to the above-mentioned listed activities additional activities have also been triggered in terms of the NEMA EIA Regulations which were promulgated on 4 December 2014. Table 1.5 of Chapter 1 contains a complete list of activities which are triggered under the new 2014 NEMA EIA Regulations. The latter table also shows the relevant activity under the 2010 NEMA that are currently being repealed by the new ones. The new listed activities triggered under the 2014 NEMA EIA Regulations have been assessed in this EIA and are listed below:

- Listing Notice 1: GN No. 983: 9, 10, 12, 15, 17, 18, 19, 24, 27, 30, 48, 49, 56
- Listing Notice 2: GN No. 984: 4, 6, 7, 14, 26
- Listing Notice 3: GN No. 985: 4, 10, 12, 14, 18, 23

## ALTERNATIVES

### Terrestrial Pipeline Routing Alternatives

As mentioned previously the Jacobsbaai Western and Eastern Corridors were assessed in this EIA (see Figure 1.1 in Chapter 1). Please note as referred to in the section on 'Terrestrial Pipeline Routing' above, although the Jacobsbaai Eastern Corridor was included and assessed as an alternative in this EIA, this alternative was deemed unfeasible. This is due to the fact that one of the affected land owners along the Jacobsbaai Eastern Corridor (Mr Smit of Forellendam (Pty) Ltd) objects to registering a servitude on his land. **The Jacobsbaai Western corridor has therefore been selected as the preferred alternative for the proposed SRMO Project.**

### Marine Pipeline Outfall Alternatives

A comprehensive screening study (Concept Options Trade-off Study) was undertaken by WorleyParsons and CSIR to identify suitable marine discharge points for Scenario 1 (Annexure 1 of Volume III of the FEIAR).

The study aimed to identify specific environmental, technical and financial constraints associated with the alternative pipeline routings and associated marine discharge points. Three potential pipeline routing alternatives were identified *i.e.* Options 1, 2 and 3 (refer to **Figure S2**). To determine the preferred route option, a matrix was developed consisting of relevant criteria separated into categories and subcategories against which each option could be measured.

The assessment criteria categories identified as appropriate for the assessment were:

- Coastal Processes and Effluent Dispersion;
- Pipeline Design and Construction;
- Potential Impact on and of Future Desalination Plant Construction;
- Financial;
- Marine Ecological Impact; and
- Terrestrial Ecological Impact.

Following the completion of the Concept Options Trade-Off Assessment, the following principal conclusions can be drawn:

- The options assessment matrix identified Option 1 as the most suitable route;
- Option 1 is also the lowest cost option (although the difference between the costs for Option 1 and Option 2 is minimal and within the margin for error); WorleyParsons believe that Option 1 (and Option 2) can be constructed without the need for extensive temporary works and excavation in rock; the offshore section of pipeline may need protection to ensure its stability under the design wave conditions;
- The difference between Option 1 and Option 2, considering the outfall pipeline in isolation, is not substantial and Option 2 remains a feasible alternative;
- Option 3 is not feasible and should not be considered further; primarily as the pipeline route is considered a no-go area in terms of botanical and faunal impacts and the blasting requirements to traverse the granite peninsula would result in significant

marine impacts. Option 3 also poses financial constraints; and

- Option 1 (Preferred) and Option 2 (Alternative) were therefore considered within the scope of this EIA.
- **Option 1 has been identified as the preferred marine outfall for the proposed SRMO Project**

### Technological Alternatives for brine disposal

A number of different technological alternatives were assessed before deciding that disposal of effluent to sea would be the only option for this project. In this regard, Frontier Utilities appointed an independent engineering consultant, Process Projects, to investigate a number of alternatives for the disposal of treated effluent produced by the proposed SSP and the proposed CAPF. Process Projects subsequently completed a desktop trade-off study, dated August 2013, in which the following brine effluent disposal options were investigated (Annexure 3 of Volume III):

- a) disposal of effluent to the Saldanha or Vredenburg existing local waste water treatment works;
- b) the construction of evaporation ponds to generate salt for disposal at a licensed disposal facility;
- c) evaporating and crystallising processes to generate waste salt for disposal at a licensed disposal facility or to be re-used by the CAPF;
- d) evaporating and crystallising processes to generate salt to be re-used as feed by the CAPF; and
- e) marine disposal (*i.e.* disposal to sea) of the effluent.

The criteria used to identify the preferred disposal option were primarily technical and financial, but some environmental criteria were also considered, *e.g.* visual impacts, ground water contamination, land sterilisation, air emission impacts *etc.* In addition, Points b, c and d noted above will produce a salt precipitate requiring licensed waste disposal at

an appropriate facility which is not available. Vissershok (the nearest licensed disposal site to Saldanha), has indicated that they are not willing to accept the waste salt produced (Refer to letter dated 14 August 2013 in Appendix A of Annexure 3 of Volume III). This led to the marine disposal alternative being selected as the only option considered feasible at this point.

### PERMITS AND LICENCE REQUIREMENTS

In terms of the Integrated Coastal Management Act (No. 24 of 2008) a Coastal Waters Discharge Permit (CWDP) will be required from the Department of Environmental Affairs Oceans and Coasts: Coastal Pollution Management (DEA:O&C). This permit will regulate the disposal of brine into the marine environment. An application for this permit dated 10 September 2014 was submitted to DEA:O&C. DEA:O&C has issued the reference number: "2014/016/Frontier Saldanha" to the SRMO Project. The Application and proof of submission are attached as Annexure 4 in Volume III of this report.

In line with the National Environmental Management Act (No. 107 of 1998) Regulation 1399 regarding control of Vehicles in the Coastal Zone the applicant must apply for permission to DEA to operate a vehicle on the beach before commencing with any construction activities.

In terms of the National Water Act (No. 36 of 1998), a Water Use License Application (WULA) must be submitted to the Department of Water Affairs and Sanitation (DWS): Western Cape if any watercourses or wetlands are impacted upon by the proposed development. It is envisaged that there may be the potential that the terrestrial pipeline may traverse wetlands along the Jacobsbaai Road corridor (in this regard, Appendix C in Volume II provides a full account of wetland resources). Should the wetlands described in this study be disturbed or altered: a WULA for Section 21(c) (impeding or diverting the flow of water in a watercourse) and 21(i) (altering the bed, banks, course or characteristics of a watercourse) will be required before constructing the pipeline. AGES

Gauteng will submit a WULA on behalf of Frontier Utilities to DWS for approval.

The National Heritage Resources Act (NHRA No. 25 of 1999) protects archaeological and palaeontological sites and materials, as well as graves/cemeteries, battlefield sites and buildings, structures and features over 60 years old. The South African Heritage Resources Agency (SAHRA) administers this legislation nationally, with Heritage Resources Agencies acting at provincial level. The relevant agency in the Western Cape is Heritage Western Cape (HWC).

According to section 35 of this Act, it is an offence to destroy, damage, excavate, alter or remove from its original place, or collect, any archaeological, palaeontological and historical material or object, without a permit from the relevant Heritage Authority, viz. HWC.

A Notification of Intent to Develop (NID) dated 1 August 2014 was submitted to HWC. A reference number was assigned to the project, i.e. 14070705AS0707E. Heritage Western Cape responded to the NID and requested the undertaking of a Heritage Impact Assessment (HIA) that includes specialist studies of archaeological and palaeontological resources (letter from HWC dated 13 August 2014). A HIA was undertaken by ASHA Consulting which includes an Archaeological and a Palaeontological Assessment (Appendix E of Volume II of this FEIAR) and was submitted to HWC for approval. Heritage Western Cape provided their response in a letter dated 10 December 2014. It states that the SRMO Project was tabled at the meeting of the Impact Assessment Committee of 17 November 2014 and that the Committee supports the recommendations of the consultant (see letter in Appendix G of Volume I which includes the specific recommendations).

Additional permits may be required further into the development process should, for example: should any rare plant species be encountered onsite. Planning permits pertaining to the Sea Shore Act (Act 21 of 1935) for shore crossing

and other servitude registration permits will also be required by the applicant.

## NEED AND DESIRABILITY

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The Saldanha Bay region represents a dynamic interface of heavy industry, port related activities, residential zones and critical terrestrial/marine biodiversity areas. The implementation of the Industrial Development Zone (IDZ) and the proposed expansion of the port as well as a multitude of other proposed developments in the region (there are many EIA studies being undertaken) make it an area with enormous growth potential; however, this growth needs to take ecological constraints into consideration.

The National Government of South Africa also recently adopted an Infrastructure Plan that is intended to transform the economic landscape of South Africa, create a significant number of new employment opportunities, strengthen the delivery of basic services and support the integration of African communities. For this purpose the Cabinet of South Africa took a decision to establish a body to integrate and coordinate this long term infrastructure development plan namely the Presidential Infrastructure Coordinating Commission (PICC) with its supporting management structures.

The PICC reports back on work to assess the infrastructure gaps through spatial mapping which analyses future population growth, projected economic growth and areas of South Africa not served with sufficient water, electricity, roads, sanitation and communication.

Based on this work, seventeen Strategic Integrated Projects (SIPs) have been developed and approved to support economic development and address service delivery in the poorest of the nine provinces in South Africa. Each SIP comprises of a large number of specific infrastructure components and programmes. The work will be aligned with human settlement planning and with skills development as key cross-cutting areas.

SIP 5 comprises the development of the Saldanha-Northern Cape Province linked region in an integrated manner that ensures that the region becomes a value adding centre rather than simply a transit corridor for iron-ore export from the Sishen area iron-ore mines in the Northern Cape.

For Saldanha Bay this entails developing the back of port (which is the only natural deep sea port in South Africa) industrial capacity (including an IDZ) and strengthening maritime support capacity to create economic opportunities for the region.

The Department of Trade and Industry has identified Special Economic Zones (SEZs) as key levers in support of long-term industrial and economic development. The SEZs Programme was specifically developed to promote the creation of a regionally diversified industrial economy by establishing new industrial hubs in underdeveloped regions of the country. Saldanha is one such area which has been identified as the first key milestone in the roll out of the SEZs. The aim is to establish SEZs that can achieve the following:

- Increased foreign and domestic investment;
- Increased beneficiation of mineral and agricultural resources;
- Increased export of beneficiated products;
- World-class infrastructure;
- Increased employment opportunities; and
- Regional industrial development.

Looking to future development trends, in its consideration of areas of economic opportunity, the Provincial Growth and Development Strategy of 2006 identified the Saldanha and Mossel Bay areas as the two 'regional motors' in the province (PGWC, 2006). In this strategy it is envisioned that the emerging industrial port of Saldanha-Vredenburg services key sectors, *i.e.* oil and gas, iron ore exporting and steel processing, etc. Van der Merwe *et al.* (2005) also found Saldanha and Vredenburg to have a very high growth potential in their survey of the growth potential of towns in the Western Cape.

More recently, the growth potential of the Saldanha Bay municipal area with its proximity to Cape Town and natural deep water harbour have resulted in its recognition as a Presidential Development Growth Node. This recognition is supported by the principles contained in the National Spatial Development Perspective (NSDP) and reinforced by the approved Provincial Spatial Development Framework (PSDF), (Saldanha Bay Municipality, 2008).

As with the rest of the country, unemployment is a major challenge in the area. This situation continues to be exacerbated by the current difficult economic climate characterised by relatively low levels of economic growth. The SRMO Project will facilitate the creation of employment opportunities during the construction and operational phases of the project.

Approximately 164 temporary construction jobs of 12 to 18 months are expected. Based on the likely availability of labour, training possibilities and experiences in the area, approximately 108 construction jobs should be allocated to residents of Saldanha Bay with the bulk of the remainder going to Western Cape residents. Approximately eight jobs would be created during the operational phase resulting in a total local salary bill of approximately R1.2 million per year.

Given its size and the expenditure associated with it, the project has the potential to have a significant positive impact on commercial activity in the local area during construction. It is likely that between R60 million and R80 million would accrue to contractors within the Saldanha Bay municipal area with the remainder going to other Western Cape contractors.

The Government of South African has identified the need to add value to raw materials mined within South Africa in order to realise the economic opportunities provided by the downstream processing of the raw materials.

Through the "Amendment to the Broad-Based Socio-Economic Empowerment Charter for the South African Mining Industry" (Department of



Minerals and Energy, 2010), the South African Government encourages the downstream beneficiation of raw materials, by the mining industry.

The more stages of the production process that can be carried out on South African territory, the better the outcome in terms of revenue, added value and employment. It is therefore important that separation is handled in South Africa. Should the project be approved and the South African REE industry be further developed, the potential exists for South Africa to become a regional hub for rare earth ores from other African countries that may not possess the necessary resources to separate ores (AGES, 2013).

The proposed SRMO Project will facilitate industrial growth and municipal services provision. The SBM acknowledged in a letter dated 10 February 2015 (Appendix B6 of Volume I) that the project will contribute to the development of the Greater Saldanha industrial and commercial areas. It would be a pre-requisite for the proposed regional WWTW by the SBM that will further assist the development of the SBM Industrial Development Area. The project is seen as vital to ensure economic growth for Saldanha Bay and the surrounding area.

In addition, the SRMO Project offers valuable industrial infrastructure to the Saldanha Bay area and is supported by institutions such as the Saldanha Bay Water Quality Forum Trust (SBWQFT). This is since the project can alleviate future effluent disposal requirements within the Saldanha small bay area. Please refer to Appendix B7 of Volume I for a letter of support from the SBWQFT.

The SRMO Project is also supported by current industry within Saldanha as future disposal of salt or brine on land needs to be phased out within eight years (initiated 2013, Government Gazette 23 August 2013) as noted in the Waste Disposal restrictions under the Norms and Standards for Waste Disposal to Landfill. Please refer to Appendix B8 for a letter of support from ArcelorMittal.

## **SUMMARY OF NEGATIVE IMPACTS RELATING TO THE PROJECT**

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### **1. Marine Ecology**

The primary impacts to the Marine Ecology are:

- Altered flows at the discharge resulting in ecological impacts (e.g. flow distortion/changes and effects on natural sediment dynamics);
- Potential for habitat health impacts/losses resulting from elevated salinity in the vicinity of the discharge;
- The effect of the discharged effluent potentially having a higher temperature than the receiving environment;
- Potential toxicity to marine organisms of constituents in the waste-water streams from the REE separation plant, the CAPF, and the WWTW;
- The effect of elevated organic inputs and nutrient levels on marine biota in the effluent stream from the WWTW;
- Biocidal action of residual chlorine (or other alternative biocides) in the effluent stream from the WWTW;
- Direct changes in dissolved oxygen content due to the difference between the ambient dissolved oxygen concentrations and those in the discharged effluent, and indirect changes in dissolved oxygen content of the water column and sediments as a result of nutrient inputs;
- Disturbance and destruction of intertidal beach macrofauna during pipeline construction as a result of vehicular traffic, jetty construction and excavations;
- Accidental spillage or leakage of fuel, chemicals, or lubricants that may cause water or sediment contamination and/or disturbance to beach and subtidal biota;
- Disturbance and destruction of subtidal sandy and rocky reef biota during laying of the discharge pipeline, jetty construction, surf-zone excavation and rock blasting;
- Effects of blasting, should it be required, on macrophytes, invertebrates and fish communities;



- Effects of blasting, should it be required, on marine communities, particularly turtles and marine mammals;
- Discharge of high density saline brine may cause sinking of the plume, seafloor spreading and increases in porewater salinity;
- Increased salinity in the mixing zone affects biota;
- Reduction in dissolved oxygen concentrations of the receiving water as a result of dechlorination or elevated nutrients from the WWTW;
- Heavy metals may affect dissolved metal concentrations in the receiving water;
- Effects of REEs on marine communities in the mixing zone;
- Effects of discharged co-pollutants; and
- Avoidance behaviour by fish, marine mammals and/or turtles of the discharge area.

## 2. Terrestrial Ecology

- Direct, permanent loss of natural vegetation and associated plant and faunal SCC within the development footprint at the construction phase (the loss of Very High sensitivity vegetation in the Jacobsbaai area being the primary concern);
- Temporary to long term direct loss and degradation of natural vegetation and faunal habitat at the construction phase (laydown and soil storage areas; work areas); and
- Indirect ecological impacts at the operational phase (introduction of invasive alien plants; fragmentation of natural habitat and ecological corridors; fragmentation and reduction of sub-populations of rare/threatened plant species).

## 3. Wetlands

- Disturbance of wetland habitat along the disturbed area;

- Compaction of the surface over the pipeline footprint, potentially making re-establishment of wetland plants difficult; and
- Effective infilling of wetland habitat, if infilling of the pipeline trench resulted in a final surface that was raised above pre-construction levels – not only would this result in loss of wetland habitat and the creation of a disturbed terrestrial corridor, prone to alien and weedy plant invasion, but it would potentially contribute to localised habitat fragmentation and changes in flow in channelled portions of the wetland.

## 4. Visual

- Intrusion of construction activity on views of sensitive visual receptors at Danger Bay;
- Intrusion of construction activity along power line and pipeline corridors on views of sensitive visual receptors;
- Visual intrusion of a pump station and associated structures at Danger Bay on the views of sensitive visual receptors;
- Visual intrusion of 11 kV overhead power lines from Pump Station E to Jacobsbaai on views of sensitive visual receptors; and
- Impact of night lighting of Pump Station E at Danger Bay on the nightscape.

## 5. Heritage (including Archaeology and Palaeontology)

- Loss of Archaeological resources;
- Loss of Palaeontological resources;
- Impact on scenic routes; and
- Impact on unmarked graves.

## 6. Economics

- Impact on mariculture and fishing; and
- Impact on tourism and recreation.

The table below lists all the key impacts of High significance (before mitigation) and Medium significance after mitigation.

**Table S2: Most important negative environmental impacts and mitigation measures associated with the SRMO Project**

KEY IMPACTS		MANAGEMENT ACTIONS	
MARINE ECOLOGY			
The key issues identified relevant to the operational phase:			
Two negative impacts of high significance (before mitigation) associated with the operational phase of the SRMO Project (Scenario 1 and Scenario 2) were identified:			
1. Effects of biocide plume on marine communities in the mixing zone.	1.1	Dechlorinate effluent with sodium bisulphite (SBS) prior to discharge.	
	1.2	Pigging of discharge pipeline should be undertaken as it can reduce the need for and costs of biocides.	
2. Potential synergistic and antagonistic effects of a combined effluent.	2.1	Should concentrations of heavy metals and REEs in the effluent generated during normal operation of the separation plant not fall within the guidelines (DWAF 1995; ANZECC 2000 or others that may be applicable), polishing of the brine by metals precipitation should be undertaken. Investigate the use of lime as the alkali.	
	2.2	Commission a specialist study to investigate potential synergistic and antagonistic effects of the effluents.	
Seven negative impacts of medium significance (before mitigation) associated with the operational phase of the SRMO (Scenario 1 and Scenario 2) were identified:			
1. Discharge of high density saline brine may cause sinking of the plume, seafloor spreading and increases in porewater salinity.	1.1.	Ensure sufficient mixing of the effluent with the receiving water body by adjusting the discharge configuration appropriately.	
	1.2.	Limit increased salinity to mixing zone.	
2. Increased salinity in the mixing zone affects biota.	2.1	Ensure sufficient mixing of the effluent with the receiving water body by adjusting the discharge configuration appropriately.	
	2.2	Limit increased salinity to mixing zone.	
3. Reduction in dissolved oxygen concentrations of the receiving water as a result of dechlorination or elevated nutrients from the WWTW.	3.1	Aeration of the effluent prior to discharge.	
	3.2	Effective screening of organic matter in the WWTW.	
4. Heavy metals may affect dissolved metal concentrations in the receiving water.	4.1	Design outfall properly, e.g. by eliminating dead spots and threaded connections, to reduce corrosion to a minimum.	
	4.2	Corrosion resistance is considered good when the corrosion rate is <0.1 mm/a (UNEP 2008).	
	4.3	Monitor corrosion rate in the various plants.	
	4.4	Monitor effluents for metal concentrations.	
5. Effects of REEs on marine communities in the mixing zone.	5.1	Monitor effluents from SSP regularly for REE concentrations.	
6. Effects of discharged co-pollutants.	6.1	Treat backwash from brine purification filters in slurry tank, neutralize, and remove solids for alternative disposal on land.	
	6.2	Monitor effluents from all plants regularly for the presence of toxic constituents.	

KEY IMPACTS	MANAGEMENT ACTIONS
	6.3 Wherever possible, select constituents and chemicals that have relevant eco-toxicological testing.
	6.4 Regularly conduct Whole Effluent Toxicity (WET) testing of the effluent.
7. Avoidance behaviour by fish, marine mammals and/or turtles of the discharge area.	7.1 Ensure sufficient mixing of the discharged brine with the receiving water body by adjusting the discharge configuration appropriately.
	7.2 Limit the size of the mixing zone to a minimum.
<b><u>The management actions and mitigation measures recommended for Marine Ecology (Scenario 1 and Scenario 2) will reduce the negative impacts of 'high', 'medium to high' and of 'medium' significance to 'low' significance. If the recommended mitigation measures are applied effectively, no negative residual impacts of high significance are predicted.</u></b>	
<b>TERRESTRIAL ECOLOGY (FAUNA AND FLORA)</b>	
1. Pump Station E is likely to have a <b>Medium negative</b> botanical impact, <b>before and after mitigation (Low – Medium negative faunal impact).</b>	1.1. None required
2. Both proposed pipeline routes (Jacobsbaai Western and Eastern Corridors) will have some negative botanical and faunal impacts which cannot be avoided or mitigated. Without mitigation the Jacobsbaai Western corridor will have a <b>High negative botanical impact (Medium negative faunal impact), which could be reduced to Medium negative with mitigation (reroute portion of pipeline or Low – Medium negative with financial contribution to a biodiversity offset; (Low negative for faunal impact).</b>	2.1 Reroute a portion of the pipeline route to the northern side of the Jacobsbaai Road between Pump Stations C and D thereby avoiding sensitive wetland areas on the southern side of the Jacobsbaai Road
	2.2 Rescue of all bulbs and succulents in footprint.
	2.3 Search & Rescue of all animals that fall into open trenches; catchfences along all open trenches.
	2.4 Construct the disturbance footprint entirely within the road reserve west of the main road (for approximately 2 000 m section traversing through an area with endangered vegetation (within and to the south of Jacobsbaai)
	2.5 Bury pipeline on the western (seaward) side of the road as this side is more disturbed and hence less sensitive than the eastern side (for approximately 2 000 m section traversing through an area with endangered vegetation (within and to the south of Jacobsbaai)
	2.6 Determine an appropriate financial contribution to a biodiversity offset.
3. The Jacobsbaai Eastern Corridor will have a <b>Medium negative botanical impact, both before and after mitigation. Faunal impact is likely to be Medium negative before mitigation, and Low negative after mitigation.</b>	3.1. Search & Rescue of rare plant species.
	3.2 Rehabilitation
	3.3 Search & Rescue of all animals that fall into open trenches; catchfences along all open trenches.

KEY IMPACTS	MANAGEMENT ACTIONS
Thus if rerouting of a portion of the Jacobsbaai Western Corridor is undertaken, and all mitigation is put in place then there is no strongly preferred routing alternative from a botanical perspective.	
<b>WETLAND IMPACTS</b>	
1. Wetland 1: Disturbance, compaction and infilling- <b>High Negative (before Mitigation) and Negative Low (after Mitigation)</b>	1.1 Avoidance of wetland 1 by routing pipeline along northern side of road.
	1.2 Implement measures to prevent contamination of wetlands with construction material and minimise disturbance footprint, as per Construction phase EMP.
	1.3 Time construction within wetland areas for outside of the wet season.
	1.4 Rehabilitate disturbed areas north of the road such that pre-construction levels are retained along the pipeline corridor and wetlands are not thus infilled.
<b>VISUAL IMPACTS</b>	
1. Intrusion of construction activity along power line and pipeline corridors on views of sensitive visual receptors ( <b>Medium Negative before and after mitigation</b> ).	1.1. Construction duration should be kept as short as is practical in order to reduce the visual impact of the construction phase on visual receptors.
	1.2. Temporary laydown areas should be located in low visibility areas and existing vegetation should be used to screen these where possible.
2. Visual intrusion of 11 kV overhead power lines from Pump Station E to Jacobsbaai on views of sensitive visual receptors ( <b>Medium Negative before and after mitigation</b> ).	2.1 Use existing dunes to conceal as much development as possible.
	2.2 Keep building and structure heights as low as possible in order to reduce structure visibility.
	2.3 Use non-reflective paint for buildings and structures in a colour that blends in as well as possible with the background (e.g. RAL-9010, RAL-9016, RAL-9003 or RAL-9001).
	2.4 The maintenance plan should include regular maintenance of exterior facades since the pump station and associated structures are likely to be highly exposed to the elements.
<b>HERITAGE IMPACTS</b>	
1. Impact on unmarked graves ( <b>High and Negative before Mitigation; Negative and Low after Mitigation</b> )	1.1 During construction, any graves intersected should be immediately protected and reported to an Archaeologist or to HWC. Exhumation by an archaeologist will be required.

## SUMMARY OF POSITIVE IMPACTS RELATING TO THE PROJECT

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The overall aim of the proposed SRMO Project is to dispose of effluent from the proposed SSP; and from other industries such as the proposed CAPF and the regional WWTW proposed by the SBM.

The proposed SRMO Project would be a pre-requisite for the development of the SSP as the latter would only be technically feasible if process effluent can be legally disposed of. The benefits associated with the SSP can therefore be viewed as indirect or facilitated benefits of the SRMO Project.

From a municipal service provision perspective, the SRMO Project would facilitate wastewater service provision by the SBM. Frontier Utilities would take the primary financial risks associated with the construction of the project to the ultimate benefit of the SBM. The option of using the facility will then be open to the SBM once the mooted new WWTW proceeds. This would support efforts by the SBM to keep future wastewater services provision costs (and therefore service charges to users) as low as possible.

The plant would have a positive impact on economic activity in the local area and region given the size of the new spending injections associated with it. An estimated R113 million expenditure on the project is anticipated. Approximately 164 temporary construction jobs of 12 to 18 months are expected. The majority of these would be medium and low skilled positions in keeping with the nature of the construction required. A total direct labour income of R20 million would be associated with the construction phase. The annual operational expenditures would be approximately R2.6 million per year. Approximately eight permanent jobs will be associated with the operation phase of the plant resulting in a total operational labour local salary bill of approximately R1.2 million per year. In addition to the above direct employment and associated income opportunities, a number of temporary

indirect opportunities would be associated with the project.

The project will have a positive impact on economic activity in the area. The impact will be **positive with a medium significance** rating with mitigation during construction. The impact during the operational phases will be **positive with a low significance** rating given jobs and income effects.

In summary, the positive impacts identified are:

- Impacts associated with project investment / expenditure (**Low to Medium before mitigation; Medium after Mitigation**);
- Impacts on industrial development opportunities (**High before and after mitigation**);
- Impacts on municipal services provision (**Medium before and after mitigation**); and
- Impacts associated with project investment / expenditure (**Low before and after mitigation**).

Two additional positive impacts have also been identified:

- Discovery of new fossils and new information on the local geology (**Positive, Medium significance after mitigation**).
- The construction of the breakwater and submerged pipeline during operation may act as artificial reefs (**Positive, Medium significance after mitigation**).

### Indirect positive impact for Ecology

No potentially positive benefits of this project have been identified in terms of vegetation or fauna. However, if a suitable financial contribution to a biodiversity offset is implemented then certain positive impacts could be realized, notably by providing funding for ecological management of valuable land parcels as identified by CapeNature or another authority or institution. It should be noted that the magnitude and hence significance of the



positive impact is related to the scale of the offset.

## **EAP IMPACT STATEMENT AND RECOMMENDATIONS**

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No negative impacts have been identified that, in the opinion of the Environmental Assessment Practitioner (EAP), should be considered “fatal flaws” from an environmental perspective, and thereby necessitate substantial re-design or termination of the project.

Through the course of the EIA process, the project layout went through several iterations after consultation with the specialists on the project team as well as after consultation with affected landowners. This indicates how the EIA process has actively and effectively informed the project planning.

Residual impacts are those that are expected to remain high once appropriate mitigation has been implemented. No negative residual impacts were identified for the proposed SRMO Project. The specialists indicated that the Negative impacts of High significance before mitigation could be changed to Medium and Low significance provided the appropriate mitigation measures are put in place.

Taking into consideration the findings of the EIA process for the proposed SRMO Project, it is the opinion of the EAP that the negative impacts can be successfully mitigated and that overall impacts are not of such a nature to reject the project.

Provided that the specified mitigation measures are applied effectively, it is proposed that the project receives an Environmental Authorisation (EA) in terms of the 2010 EIA Regulations promulgated under the National Environmental Management Act (NEMA) provided that the following recommendations are attached to the EA.

- In the event that the WCDM Desalination Plant is constructed and the associated marine outfall pipeline becomes operational, Frontier Utilities will co-

dispose the SRMO effluent via the marine outfall pipeline of the WCDM desalination plant in line with the Heads of Agreement (HOA) signed between Frontier and the WCDM on 01 November, 2013 (see Appendix B1). This will be subject to an Amendment to the EA issued for the WCDM desalination plant dated 13 August 2013. The Amendment to the EA for the actual desalination plant must be undertaken by the project applicant (the WCDM) in collaboration with Frontier Utilities and in line with the broad principles and commercial terms as established in the HOA;

- The EA should be for Scenario 1 as explained in section 9.7 above. Scenario 1 considers no WCDM desalination plant, with the SRMO effluent to be disposed of via an alternative sea disposal option;
- The WCDM desalination plant and its associated infrastructure received EA from the DEA&DP on 13 August 2013. Scenario 2 assumes the completed construction of the WCDM desalination plant, with the SRMO effluent to be disposed of in combination with the brine return from the proposed WCDM desalination plant. Should Scenario 2 be implemented first, an Application for an Amendment to the existing WCDM CWDP (should this have been issued at the time) will need to be made to the DEA&DP and DEA: O&C respectively to accommodate the additional SRMO effluent;
- The power line corridors shown in Figures S1 and 9.2 of Chapter 9 must be approved;
- The submission of the FEIAR to DEA&DP, and the comments received on the FEIAR from CapeNature should be used by DEA&DP to guide the conditions of the EA (if applicable). Should an EA be granted, DEA&DP must include a condition wherein Frontier Saldanha Utilities must enter into a shared agreement with CapeNature (or another appropriate institution) regarding the nature and value of the financial contribution to a suitable offset

programme in the Vredenburg/Saldanha area;

- Should an EA be granted, DEA&DP must include a condition wherein Frontier Saldanha Utilities must undertake a plant rehabilitation programme (including a Search and Rescue Programme) as specified by the botanical specialist, Mr Nick Helme in the Ecological study (Appendix B of Volume II) and the EMP of the SRMO Project (Section B of Volume I of the FEIAR);
- It is recommended that for the section pipeline of approximately 2 000 m traversing through an area with endangered vegetation (within and to the south of Jacobsbaai), the pipeline construction disturbance footprint should be entirely within the road reserve west of the main road, to reduce impacts on sensitive vegetation along the pipeline corridor. Most of the Species of Special Concern are located east of the main road, or outside of the road reserve. This recommendation has been accepted by Frontier Saldanha Utilities;
- It is recommended that for the section pipeline of approximately 2 000 m traversing through an area with endangered vegetation (within and to the south of Jacobsbaai) the proposed pipeline must be buried on the western (seaward) side of the road as this side is more disturbed and hence less sensitive than the eastern side; and
- The layout and preferred alternatives contained in **Figure S1** should be approved:
  - The Jacobsbaai Western Corridor is the preferred pipeline routing alternative;
  - The marine outfall option 1 in Danger Bay is the preferred outfall alternative; and
  - The pipeline must be constructed on the northern side of the Jacobsbaai Road between the proposed Pump Stations C and D thereby avoiding sensitive wetland areas on the southern side of the Jacobsbaai Road.



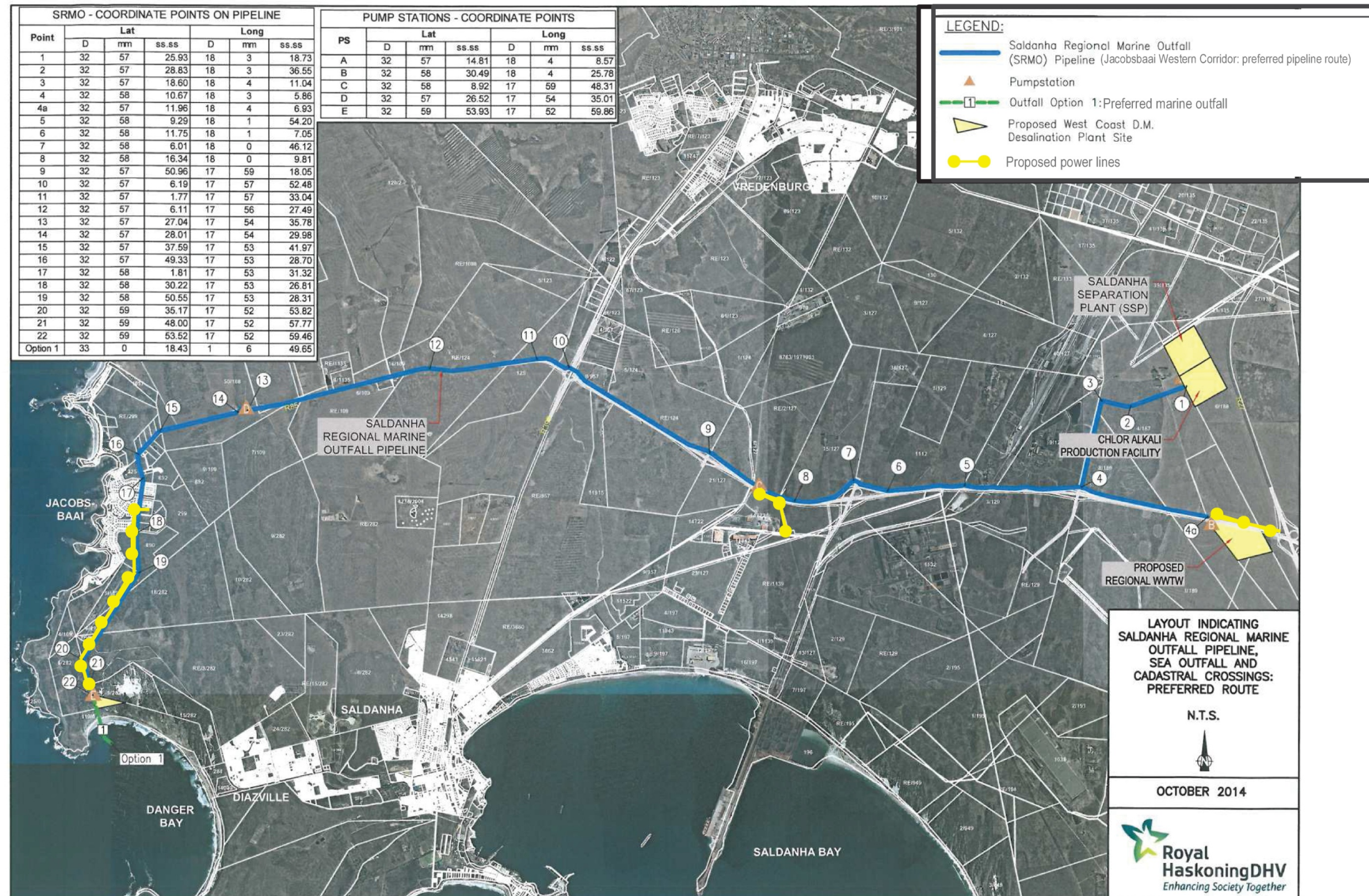


Figure S1: Recommended draft layout of the proposed Saldanha Regional Marine Outfall Project



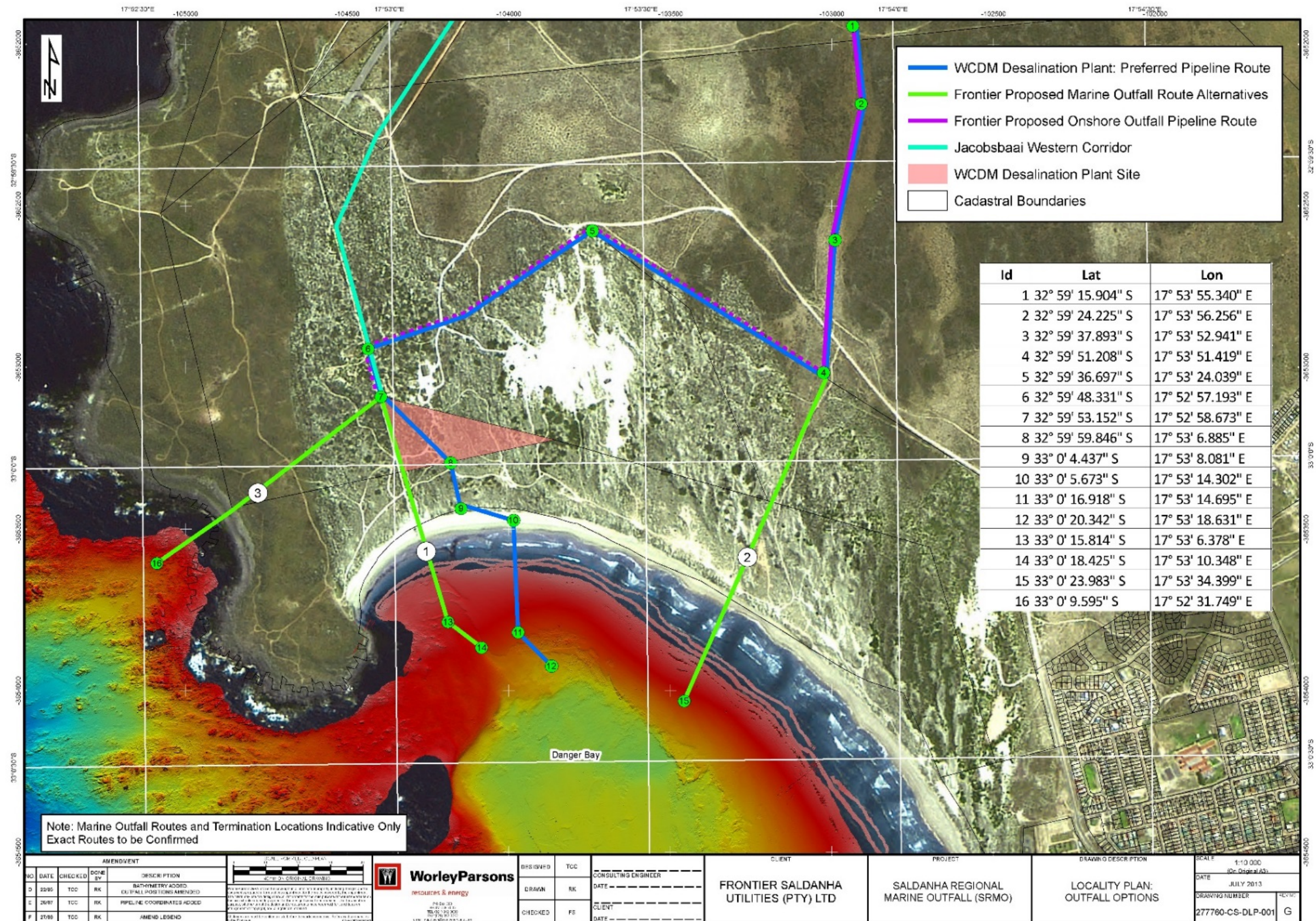


Figure S2: Frontier proposed marine outfall route alternatives