IWULA Report

AS-R-WUL-2015-04-02

APPLICATION FOR AN INTEGRATED WATER USE LICENCE IN TERMS OF SECTION 40 OF THE NATIONAL WATER ACT (ACT 36 OF 1998) REPORT FOR THE PROPOSED CONSTRUCTION, OPERATION AND DECOMMISSIONING OF THE SALDANHA REGIONAL MARINE OUTFALL PROJECT OF FRONTIER SALDANHA UTILITIES (PTY) LTD AT DANGER BAY, SALDANHA BAY LOCAL MUNICIPALITY

April 2015

Prepared for: DWS

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Compiled by: H Gildenhuys

C Uys

AGES Purpose with Passion

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IWULA Report: Saldanha Regional Marine Outfall

Prepared by

AGES

Purpose with Passion

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April 2015

Conducted on behalf of:
Frontier Saldanha Utilities (Pty) Ltd

Compiled by:
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Drikus Janse Van Rensburg	March 2015	Frontier Saldanha Utilities (Pty) Ltd: Project manager

LICENSE SUMMARY

Africa Geo Environmental Services Gauteng (Pty) Ltd (AGES) was appointed by Frontier Saldanha Utilities (Pty) Ltd (Frontier Utilities) to facilitate the Integrated Water Use Licence Application (IWULA) proposed construction, operation and decommissioning of a marine outfall pipeline and associated infrastructure in Danger Bay in the Saldanha Bay region. The pipeline transfer system is referred to as the Saldanha Regional Marine Outfall (SRMO) Project.

It is proposed that the SRMO transfer pipeline will follow to a large extent the same terrestrial corridor as proposed in the EIA for the proposed West Coast District Municipality (WCDM) desalination plant for the potable water pipeline leading to the Besaansklip reservoir. Environmental Authorisation (EA) for the desalination plant and associated linear infrastructure (including this potable water pipeline) was granted by the DEA&DP on 13 August 2013 (DEA&DP Reference No: E12/2/4/2-F6/16-3037/11).

The proposed SRMO transfer system will consist of a pipeline with transfer pump stations located along the pipeline route.

The 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 (see locality and infrastructure plan map in Figure 1-1 and Figure 1-5):

- a Rare Earth Element (REE) Separation Plant [referred to as the Saldanha Separation Plant (SP)] proposed by Frontier Separation Pty (Ltd) (EIA in progress; being undertaken by AGES, DEA&DP 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; being 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 Local Municipality (SBLM) (EIA not yet commissioned).

The location of the proposed outfall pipeline route alignment is illustrated in Figure 1-2.

The following Table presents information relevant to this IWULA:

1.	The Applicant:	Frontier Saldanha Utilities Pty Ltd
	Contact Details	Cyril Thomas PO Box 4604, Cape Town 8000 Tel: 021 446 6040 cthomas@frontierrareearths.co.za
2.	Water Uses	The water uses applied for in this Integrated Water Use License Application (IWULA) in terms of the National Water Act, 1998 (NWA) are listed below:
2.3	Section 21 (c)	Impeding or diverting the flow of water in a watercourse – please refer to Section 5.4.1
2.5	Section 21 (i)	Altering the bed, banks, course or characteristics of a watercourse – please refer to Section 5.4.1
3.	Properties on which the water use will be taking place	The affected properties are: farms Jacobs Bay 109 (RE and Portion 16) and Phillips Kraal 125 (RE)
4.	Ownership of the properties	The remainder of the Farm Jacobs Bay 109 is owned by Fastpulse Trading 63 (Pty) Ltd. Portion 16 of the Farm Jacobs Bay 109 is owned by Hendrik Johannes

		Pretorius. The remainder of the Farm Phillips Kraal 125 is owned by Centrepoint Farmsteads Pty Ltd.
5.	License application and review period	The proposed pipeline will be designed with a potential lifespan of approximately 30 years; however, it is envisaged that the WCDM desalination plant will be commissioned well within this period and that the marine component of the SRMO will be decommissioned and rehabilitated (i.e. there will be a shared outfall facility utilised by the WCDM desalination plant and the effluent emanating from the SRMO).

The proposed development will include the following water uses as set out in Section 21 of the National Water Act (Act 36 of 1998) processes.

Section 21c and 21i: Impeding or diverting of a watercourse; and altering the bed, banks or characteristics of a watercourse in terms of the NWA

The proposed SRMO transfer system will consist of a pipeline with transfer pump stations located along the pipeline route. The proposed pipeline will have a diameter of approximately 900 mm and will be approximately 27 km long from the SP to the outfall in Danger Bay. The pipe will most likely be constructed from High density polyethylene (HDPE) or will be a glass reinforced plastic (GRP) pipe. The proposed terrestrial pipeline will be buried to minimize the risk of theft, vandalism and veld fire damage. The marine outfall will be low pressure mains and constructed in accordance with SABS 1200. The marine disposal pipeline will 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. Some excavation of underlying rock may be required for the burial of the pipeline through the beach, surf and offshore areas, which may necessitate the use of blasting methods.

Two aquatic ecosystems that may be affected by the SRMO and associated infrastructure were identified along the Jacobs Bay road in the WCDM 10 m servitude. Both pipeline routing alternatives follow the same route along this section of the pipeline.

However due to the impacts associated with the delineated Wetland 1 on the southern side of the Jacobsbaai Road, it is proposed that the pipeline and electrical corridor will be routed along the northern section of the Jacobsbaai Road through the disturbed portion of an ephemeral pan.

In the case of Wetland 2, comprising the Bok River valley bottom wetland, installation of the pipelines would impact on the wetland over a highly localised area. As the proposed corridor development will occur within 500 m of these wetlands, an Integrated Water Use Licence Application (IWULA) will need to be submitted to the Department of Water and Sanitation (DWS). Activities associated with the pipeline construction will involve the excavation of a pipeline trench, stockpiling of excavated soil and compaction over the pipelines.

The general coordinates for the start, middle-and end-point for the proposed pipeline are as follows:

	Latitude (S)	**Longitude (E)**
• Starting point of the activity	32°57’25.93“	18°3‘18.73“
• End point of the activity		
– Option 1	33°0’18.43’’	1°6’49.65’’
– Option 2	33°0’23.98	1°6’25.60’’
– Option 3	33°0’20.34’’	1°6’41.37’’

Datum: WGS84

The general coordinates for the pipeline infrastructure which is proposed to be constructed within 500m of Wetland 1 and 2 and for which a water use licence is required is provided in the table below:

Water use	Description	Property	Latitude (S)	Longitude (E)	No. on map
21c & i	Wetland 1 Crossing start	Jacobs Bay 109	32°57'12.62''	17°55'52.05''	W1_S
21c & i	Wetland 1 Crossing end	Jacobs Bay 109	32°57'14.71''	17°55'41.69''	W1_E
21c & i	Wetland 2 Crossing start	Phillips Kraal 125	32°57'2.67''	17°57'24.25''	W2_S
21c & i	Wetland 2 Crossing end	Phillips Kraal 125	32°57'2.71''	17°57'23.07''	W2_E

Discharge of effluent in terms of the ICM

In terms of the ICM Act of 2008 a Coastal Waters Discharge Permit (CWDP) will be required from the Department of Environmental Affairs: Oceans and Coasts (DEA:O&C): Coastal Pollution Management. This permit will regulate the disposal of brine into the marine environment. In terms of Section 69 of the ICM Act anyone who wishes to discharge any effluent into the coast must apply to DEA for a Coastal Waters Discharge Permit (CWDP). An application for a CWDP dated 10 September 2014 was submitted to DEA: O&C by the CSIR on behalf of Frontier Utilities. DEA: O&C has issued the reference number: "2014/016/Frontier Saldanha" to the SRMO Project.

Water Management Area

The proposed SRMO pipeline routing options lie within quaternary catchment G10M, in the Berg River Water Management Area. One of the wetlands assessed in this study (Wetland 1) lies within minor catchments, which either dissipates or drains directly into the sea to the west. The other assessed area (Wetland 2) is situated in the catchment of the Bok River, which flows south into Saldanha Bay.

Wetland 1 is classified as a Strandveld Depression (Job et al. 2008). Strandveld Depressions Strandveld depression wetlands such as this occur primarily on the Saldanha Peninsula and just north of the lower Berg River, and are described as being primarily reliant on precipitation rather than groundwater or surface flow, and usually brackish to saline. In the present case, the wetland appeared to function as a perched system, and did not connect to any channelled outflow. During periods of particularly high surface runoff, it is likely that the wetland expands its extent of inundation into the surrounding farmland, rarely overtopping to the extent that it drains into the adjacent watersheds.

Wetland 2 is classified as a Strandveld Valley Bottom Wetland which are located almost exclusively on the Saldanha Peninsula, and comprising seasonal wetlands, associated with lower foothill and lowland rivers. They are generally fed by hillslope seeps lying on higher ground and are not particularly groundwater-dependent. Most of the valley bottoms have a well-defined channel, but it is likely that historically they lacked a channel and water flowed as diffuse flow through marshy areas. Strandveld valley bottoms tend to be saline, and occur on neutral to alkaline sands or granite-derived soils.

Data from the National Freshwater Ecosystem Priority Area (NFEPA) and the wetland impact assessment study undertaken by Dr Liz Day as part of the WCDM desalination EIA indicated that there are 2 areas where watercourses or wetlands may be traversed by the pipeline and electrical corridor (Wetland 1 and Wetland 2); these are shown in Figure 1-3 and Figure 1-4 below (CSIR, 2014).

Affected Water Resources

There are 2 areas where watercourses or wetlands may be traversed by the pipeline and

electrical corridor (Wetland 1 and Wetland 2). Wetland 1 comprises a relatively large, seasonally inundated depressional wetland. Excavation of a pipeline trench, stockpiling of excavated soil and compaction over the pipelines would have adverse implications for wetlands. These impacts would be considered highly undesirable in the case of the delineated Wetland 1 on the southern side of the Jacobsbaai Road. The impacts are likely to be permanent and of medium intensity, and although taking place within only a small portion of the wetland, would be considered as taking place at a regional scale, given the conservation importance of Wetland 1. Due to the impacts associated with the delineated Wetland 1 on the southern side of the Jacobsbaai Road, it is proposed that the pipeline and electrical corridor will be routed along the northern section of the Jacobsbaai Road through the disturbed portion of an ephemeral pan.

In the case of Wetland 2, comprising the Bok River valley bottom wetland, installation of the pipelines would be likely to trigger most of the above impacts, over a highly localised area, but nevertheless an area with implications for flow along the channel. As the proposed corridor development will occur within 500 m of these wetlands, an Integrated Water Use Licence Application (IWULA) will be submitted to the Department of Water and Sanitation (DWS) with the Final EIR (this approach was confirmed by Mr Warren Dreyer of DWS).

Groundwater regionally flows in a south-westerly direction across the site towards the coast. As groundwater regionally flows south-westwards, it flows away from both the Langebaan Road and Elandsfontein Aquifer Systems, as well as away from existing groundwater users in the area east of the Salkor Yard. According to the 1:250 000 Hydrogeological map of Cape Town the Electrical Conductivity of groundwater found in the region are between 150 – 300 mS/m.

According to the DWAF (1998), Quality Guidelines for Domestic Water Supplies, this range is classified as unacceptable for drinking purposes and represents saline conditions. The quality of the natural groundwater is a direct result of the closeness of these aquifers to the ocean. Ambient groundwater tends towards a Na-Cl character, which is common for groundwater along the coast (Aurecon, 2013).

Conclusion

Numerous specialist studies have been associated with the EIA Phase of this project, including a Wetland Impact Assessment (Van der Walt, 2014).

The above study found that, routing the pipeline corridor along the Jacobs Bay Road (WCDM 10 m servitude) would potentially affect wetlands in the area of Wetlands 1 and 2.

The study recommended that Wetland 1 on the southern side of the road be avoided, by routing the pipelines along the northern side of the Jacobsbaai Road through the disturbed portion of an ephemeral pan. Although the assessed pipeline corridor along the Jacobsbaai Road will still cross through Wetland 2 (which is of high conservation importance), effective mitigation is considered possible in all cases.

LIST OF ABBREVIATIONS

Abbreviation	Description
AGES	Africa Geo Environmental Services Gauteng (Pty) Ltd
BID	Background Information Document
CAH	Chlor-Alkali Holdings Pty (Ltd)
CAPF	Chlor-Alkali Production Facility
CBA	Critical Biodiversity Area
CFR	Cape Floristic Region
CSIR	Council for Scientific and Industrial Research
DEA	Department of Environmental Affairs
DEA&DP	Western Cape Department of Environmental Affairs and Development Planning
DEAT	Department of Environment and Tourism
DEA:O&C	Department of Environmental Affairs: Oceans and Coasts
DEIR	Draft Environmental Impact Assessment Report
DWS	Department of Water and Sanitation
DWAF	Department of Water Affairs and Forestry
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EC	Electrical Conductivity
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Assessment Report
EMF	Environmental Management Framework
EMP	Environmental Management Programme
EMPr	Environmental Management Programme Report
FEIR	Final Environmental Impact Assessment Report
GA	General Authorisation
GDP	Gross Domestic Profit
GN	Government Notice
GRP	Glass Reinforced Plastic
HDPE	High Density Polyethylene
HDSAs	Historically Disadvantaged South Africans
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
ICM	Integrated Coastal Management Act
IEM	Integrated Environmental Management
IPAP	Industrial Policy Action Plan
IWUL	Integrated Water Use Licence
IWULA	Integrated Water Use Licence Application
IDZ	Industrial Development Zone

kVA	Kilovolt-Ampere
LM	Local Municipality
MV	Medium Voltage
LOS	Levels-Of-Service
NEMA	National Environmental Management Act
NFEPA	National Freshwater Ecosystem Priority Area
NGP	New Growth Path
NWA	National Water Act
OHL	Over Head Line
PGDS	Provincial Growth and Development Strategy
PGWC	Provincial Government of the Western Cape
PICC	Presidential Infrastructure Coordinating Commission
PSDF	West Coast District Municipality Spatial Development Framework
RE	Remaining Extent
REE	Rare Earth Elements
SABS	South African Bureau of Standards
SBM	Saldanha Bay Municipality
SBLM	Saldanha Bay Local Municipality
SBWQ	Saldanha Bay Water Quality
SBWQT	Saldanha Bay Water Quality Trust
SCC	Species of Conservation Concern
SDF	Spatial Develop Framework
SEZ	Special Economic Zones
SIP	Strategic Integrated Projects
SP	Separation Plant
SRMO	Saldanha Regional Marine Outfall
SRMOP	Saldanha Regional Marine Outfall Project
SSD	Shoulder Sight Distance
TDS	Total Dissolved Solids
WCDM	West Coast District Municipality
WMA	Water Management Area
WSA	Water Services Act
WWTW	Waste Water Treatment Works

LIST OF DEFINITIONS

Audit:	Systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the environmental management system audit criteria set by the organization are fulfilled
Environmental Assessment Practitioner (EAP)	Means the individual responsible for planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management programmes or any other appropriate environmental instrument introduced through the Regulations.
Environmental Control Officer (ECO)	Means a suitably environmentally qualified official designated to oversee the protection of the environment which could potentially be affected by the development.
Environmental Impact Assessment (EIA)	Means the independent investigation conducted and EIA report compiled by AGES in compliance with environmental legal requirements.
Ephemeral Pan	A pan in which flow does not occur throughout the year, primarily reliant on precipitation rather than groundwater or surface flow.
Interested and Affected Parties	Means an Interested and Affected Party contemplated in section 24(4)(d) of the National Environmental Management Act and which in terms of that section includes:-
Site:	Refers to the total area to be developed for the pipeline infrastructure which consists of a 27 km long pipeline with a diameter of 900mm within a 10 m servitude.
Study Area:	Refers to the larger area surrounding the proposed pipeline route.
Water Course:	Means a river or spring; a natural channel in which water flows regularly or intermittently; a wetland, lake or dam into which, or from which water flows; and any collection of water which the Minister may, by notice in the Gazette, declare to be a water course.
Water Resource:	Includes a water course, surface water, estuary, or aquifer.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1 BACKGROUND

Africa Geo Environmental Services Gauteng (Pty) Ltd (AGES) was appointed by Frontier Saldanha Utilities (Pty) Ltd (Frontier Utilities) to facilitate the Integrated Water Use Licence Application (IWULA) proposed construction, operation and decommissioning of a marine outfall pipeline and associated infrastructure in Danger Bay in the Saldanha Bay region. The pipeline transfer system is referred to as the Saldanha Regional Marine Outfall (SRMO) Project. This specific report is compiled in terms of the National Water Act (Act No 36 of 1998) (NWA).

The location of the proposed outfall pipeline route alignment is illustrated in Figure 1-1. The Council for Scientific and Industrial Research (CSIR) has been appointed by Frontier Saldanha Utilities (Pty) Ltd as the independent Environmental Assessment Practitioner (EAP) to undertake the Environmental Impact Assessment (EIA) Process.

The most pertinent applications associated with the project that require an environmental impact assessment to be undertaken include:

- An application for environmental authorisation submitted to the Department of Environmental Affairs and Development Planning (DEA&DP) in terms of the National Environmental Management Act (Act No 107 of 1998) (NEMA) read with the EIA Regulations, 2010.
- Application for an Integrated Water Use License (IWUL) from the Department of Water and Sanitation (DWS) under the National Water Act (Act No 36 of 1998) (NWA).
- An application for a Coastal Water Discharge Permit (CWDP) was submitted to the Department of Environmental Affairs: Oceans and Coasts (DEA:O&C) on 10 September 2014 by the CSIR on behalf of Frontier Utilities. DEA:O&C has issued the reference number: “2014/016/Frontier Saldanha” to the SRMO Project.

A number of other permits, authorizations, permissions etc. may be applicable to the project as further discussed in section 4 of this report.

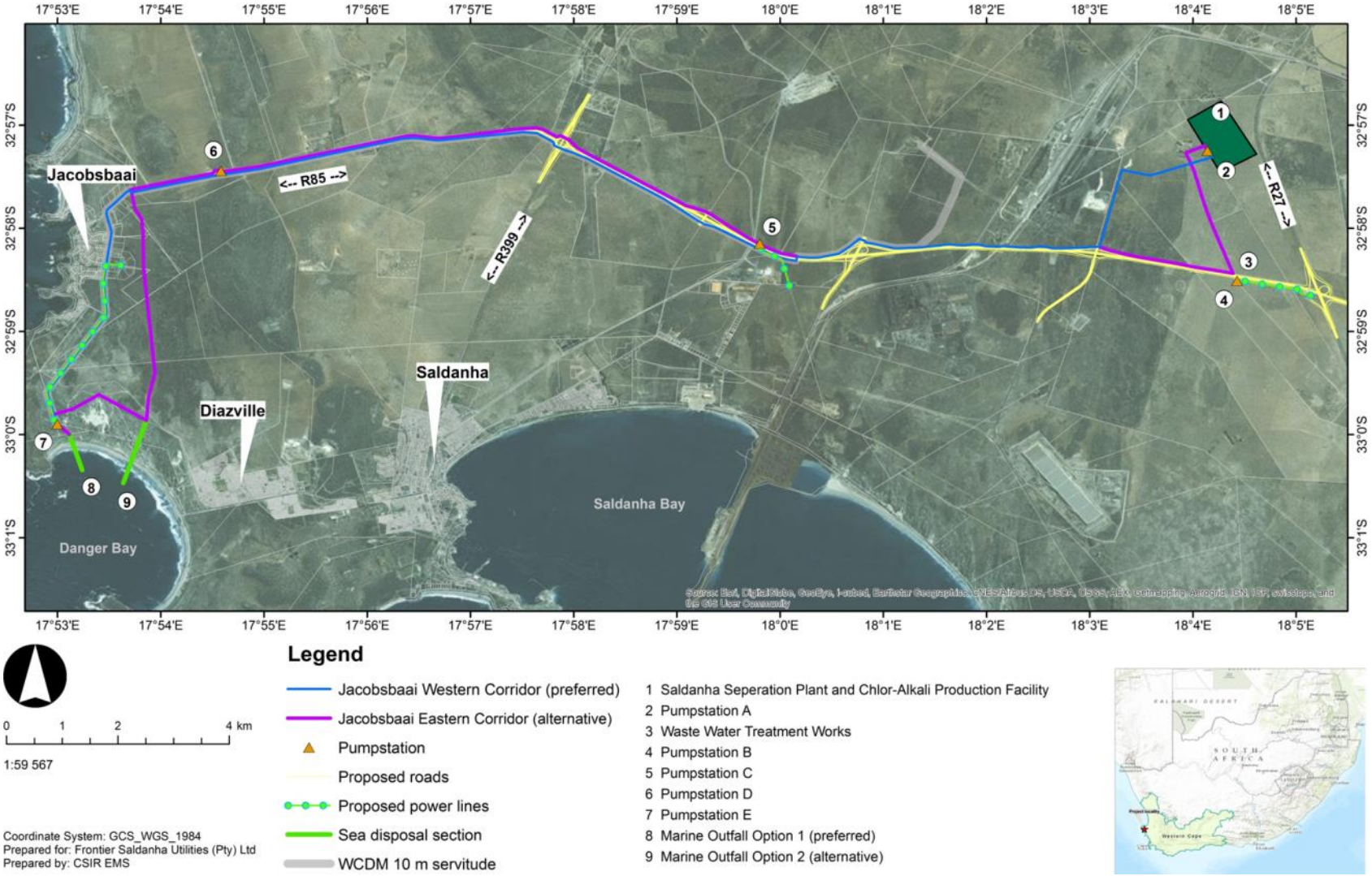

Figure 1-1: Project Locality

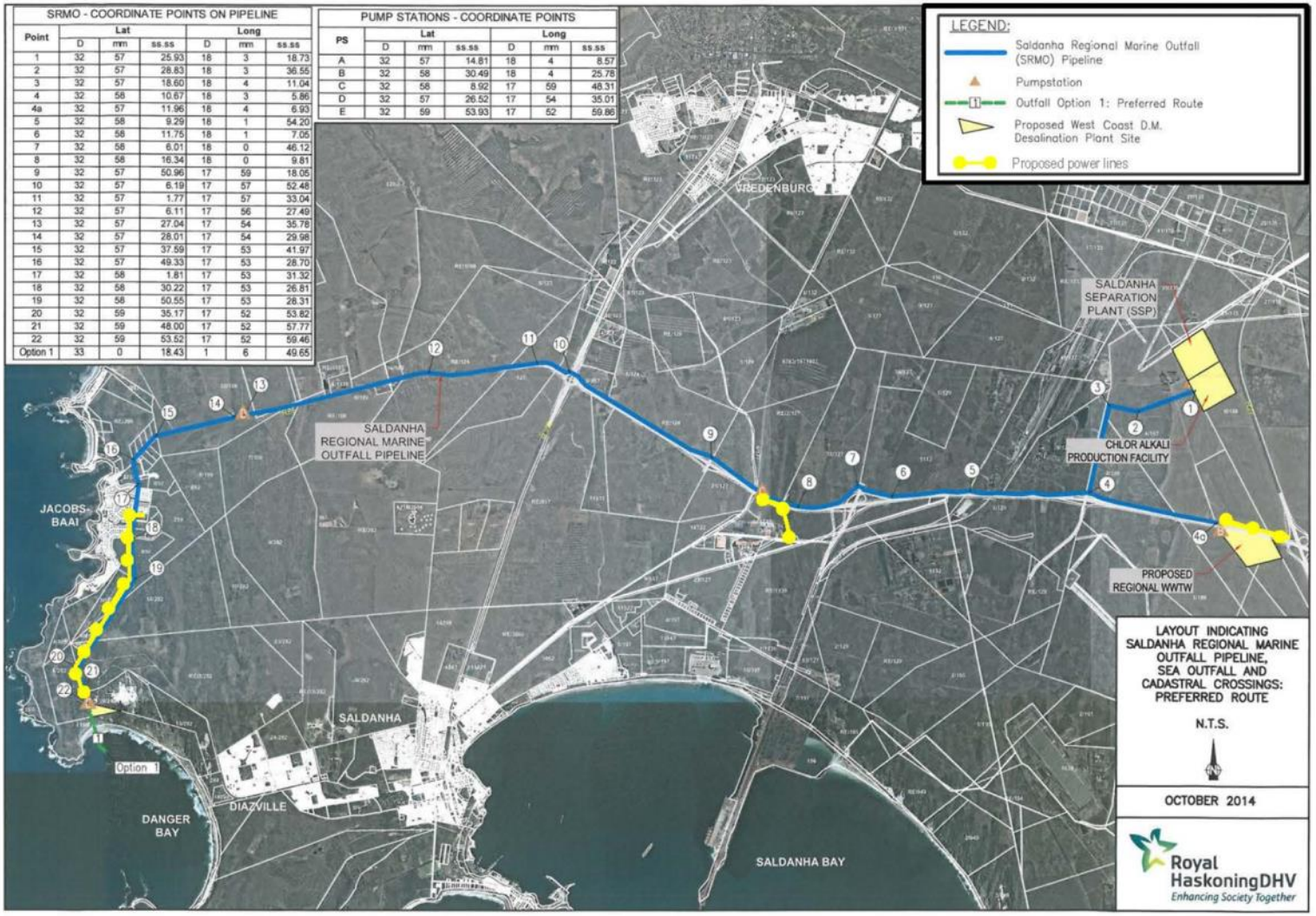

Figure 1-2: Proposed Layout with coordinates

1.1 Project Summary

It is proposed that the SRMO transfer pipeline will follow to a large extent the same terrestrial corridor as proposed in the EIA for the proposed West Coast District Municipality (WCDM) desalination plant for the potable water pipeline leading to the Besaansklip reservoir. Environmental Authorisation (EA) for the desalination plant and associated linear infrastructure (including this potable water pipeline) was granted by the DEA&DP on 13 August 2013 (DEA&DP Reference No: E12/2/4/2-F6/16-3037/11).

The proposed SRMO transfer system will consist of a pipeline with transfer pump stations located along the pipeline route.

The 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 (see locality and infrastructure plan map in Figure 1-5):

- a Rare Earth Element (REE) Separation Plant [referred to as the Separation Plant (SP)] proposed by Frontier Separation Pty (Ltd) (Frontier Separation) (EIA in progress; being undertaken by AGES, DEA&DP 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; being 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 Local Bay Municipality (SBLM) (EIA not yet commissioned).

1.2 The Applicant

The project applicant, Frontier Saldanha Utilities (Pty) Limited ("Frontier Utilities"), is a subsidiary of Frontier Rare Earths (Pty) LTD, an exploration and development company, focused primarily on the development of rare earth element (REE) projects in Africa, and is listed on the Toronto Stock Exchange.

Table 1-1: Details of the Applicant

Company Name	Frontier Saldanha Utilities Pty Ltd
Company Registration Number	2013/029091/07
Postal Address	PO Box 4604, Cape Town 8000
Responsible Person	Cyril Thomas Tel: 021 446 6040 cthomas@frontierrareearths.co.za

1.3 The Environmental Consultants

Table 1-2: Details of the environmental consultants

Company Name	Council for Scientific and Industrial Research (CSIR)
Postal Address	PO Box 320, Stellenbosch 7599
Responsible Person	Minnelise Levendal 021 888 2400 MLevendal@csir.co.za

1.4 Ownership of land (Surface Rights)

Table 1-3: Property details

Farm and Portion	Deed	Size (Ha)	Land Owner
Jacobs Bay 109			
Remainder (RE)	T33500/2010	129.3762	Fastpulse Trading 63 (Pty) Ltd
Portion 16	T58946/2008	9.7867	Hendrik Johannes Pretorius
Phillips Kraal 125			
RE	T96478/2006	137.4177	Centrepoint Farmsteads Pty Ltd

1.5 Water Management Area and Water Services Providers

1.5.1 Water Management Area (WMA)

The proposed SRMO pipeline routing options lie within quaternary catchment G10M, in the Berg River WMA. One of the wetlands assessed in this study (Wetland 1) lies within minor catchments, which either dissipates or drains directly into the sea to the west. The other assessed area (Wetland 2) is situated in the catchment of the Bok River, which flows south into Saldanha Bay (refer to Figure 2-2).

Wetland 1 is classified as a Strandveld Depression (Job et al. 2008). Strandveld Depressions Strandveld depression wetlands such as this occur primarily on the Saldanha Peninsula and just north of the lower Berg River, and are described as being primarily reliant on precipitation rather than groundwater or surface flow, and usually brackish to saline. In the present case, the wetland appeared to function as a perched system, and did not connect to any channelled outflow. During periods of particularly high surface runoff, it is likely that the wetland expands its extent of inundation into the surrounding farmland, rarely overtopping to the extent that it drains into the adjacent watersheds.

Wetland 2 is classified as a Strandveld Valley Bottom Wetland which are located almost exclusively on the Saldanha Peninsula, and comprising seasonal wetlands, associated with lower foothill and lowland rivers. They are generally fed by hillslope seeps lying on higher ground and are not particularly groundwater-dependent. Most of the valley bottoms have a well-defined channel, but it is likely that historically they lacked a channel and water flowed as diffuse flow through marshy areas. Strandveld valley bottoms tend to be saline, and occur on neutral to alkaline sands or granite-derived soils.

Data from the National Freshwater Ecosystem Priority Area (NFEPA) and the wetland impact assessment study undertaken by Dr Liz Day as part of the WCDM desalination EIA indicated that there are 2 areas where watercourses or wetlands may be traversed by the pipeline and electrical corridor (Wetland 1 and Wetland 2); these are shown in Figure 1-3 and Figure 1-4 below (CSIR, 2014).

Figure 1-3: Wetland 1 off the Jacobsbaai Road (green polygon), disturbed portion of ephemeral pan (yellow polygon)

Figure 1-4: Wetland 2 off the Jacobsbaai Road (green polygon)

Groundwater regionally flows in a south-westerly direction towards the coast. As groundwater regionally flows south-westwards, it flows away from both the Langebaan Road and Elandsfontein Aquifer Systems, as well as away from existing groundwater users in the area east of the Salkor Yard. According to the 1:250 000 Hydrogeological map of Cape Town the Electrical Conductivity of groundwater found in the region are between 150 – 300 mS/m (CSIR, 2014).

According to the DWAF (1998), Quality Guidelines for Domestic Water Supplies, this range is classified as unacceptable for drinking purposes and represents saline conditions. The quality of the natural groundwater is a direct result of the closeness of these aquifers to the ocean. Ambient groundwater tends towards a Na-Cl character, which is common for groundwater along the coast (Aurecon, 2013).

1.5.2 Water Service Providers

More than 90% of households on a provincial and local level get their water from a regional or local water scheme. On a district level, less than 80% of households get their water from a regional or local water scheme. About 10% of households on a district level get their water from a borehole. The remainder of the district get their water mainly from a

spring, dam, pool, river or stream (Aucamp; 2014).

The bulk sources of fresh water for the municipal area are wet catchment areas that are naturally recharged by rainfall. Water is provided to the Saldanha Bay Municipal area by the District Council through the Saldanha-Berg River Water Provision Scheme (VKE Engineers, 1999). The main bulk water source is the Berg River, which feeds to the Misverstand Dam from where the water is pumped to a purification facility. It is then stored in the Besaansklip and Vergeleë reservoirs. The Bezaansklip Reservoir is a district reservoir and is managed by the West Coast District Municipality (WCDM). Several other smaller reservoirs in the network store and distribute water through water pipelines. Three significant pump stations are situated at Saldanha, Vredenburg and Louwville.

The Saldanha Bay Municipality service area is a water stressed area, therefore the WCDM places considerable responsibility on the municipality to manage demand and supply wisely. The municipality in partnership with the district engaged in a pre-feasibility study to identify a sustainable long term alternative water source for the region that is less climate dependent and provides 100% security of supply as potential sources. The purpose of this study was to determine the current and future situation of water demand versus supply and to determine the feasible future options for additional water sources. Various alternative sources and combinations thereof were investigated and evaluated and eventually a 25,5 Mega litre/day sea water desalination plant in the Saldanha Bay area was identified as the most cost beneficial alternative and partial funding for the project was obtained from the Regional Bulk Infrastructure Grant (RBIG) programme from the Department of Water and Sanitation (formerly Department of Water Affairs) (Saldanha Bay Municipality IDP; 2012-2017). Environmental Authorisation (EA) for the desalination plant and associated linear infrastructure (including this potable water pipeline) was granted by the provincial DEA&DP: Land Management Region 2 (E12/2/4/2-F6/16-3037/11) on 13 August 2013.

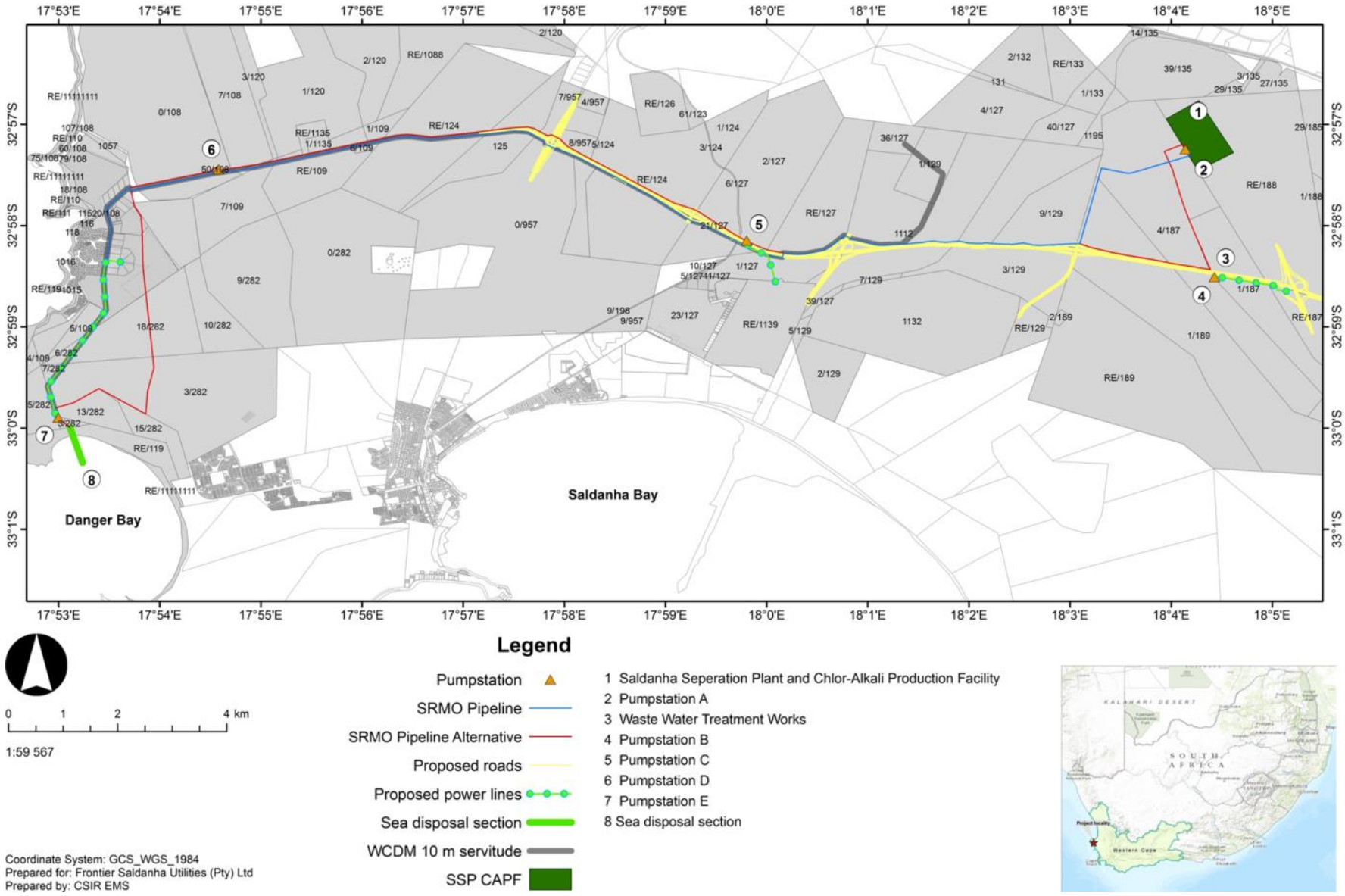

Figure 1-5: Locality map indicating farm names

1.6 Summary of Water Uses associated with the project

The following Section 21 Water Uses are associated with the proposed pipeline, and form part of this IWUL Application. These water uses are each fully discussed in Section 5 of this report.

Table 1-4: Water Uses applied for

Water use	Action	Feature	Description
21 (c)	impeding the flow of water in Wetland 1 and 2	Pipeline crossing Wetland 1 and 2	impeding or diverting the flow of water in a watercourse
21 (i)	altering the banks of Wetland 1 and 2	Pipeline crossing Wetland 1 and 2	altering the bed, banks, course or characteristics of a watercourse

2 DETAILED PROJECT DESCRIPTION

2.1 Project Motivation

2.1.1 Uses of rare earth metals

Rare earth metals are a set of seventeen chemical elements in the periodic table, specifically the fifteen lanthanides plus scandium and yttrium. Although called “rare”, some are abundant in the earth’s crust (e.g. cerium). However, they tend to occur and are recovered collectively, following which separation is required to produce separate high purity REEs. Each element has a range of distinctive physical properties.

The distinctive physical properties of the rare earth metals allow them to be used in a variety of technological applications including magnetic, optical, electrical, catalytic and metallurgical sectors. REEs underpin the “green” technology economy, and are used in hybrid motor and battery technology, energy efficiency applications, wind power generation, consumer electronics, defence applications; and transport (See Figure 2-1). Most of these elements have no substitutes and are indispensable in many of the applications mentioned (CSIR, 2014).

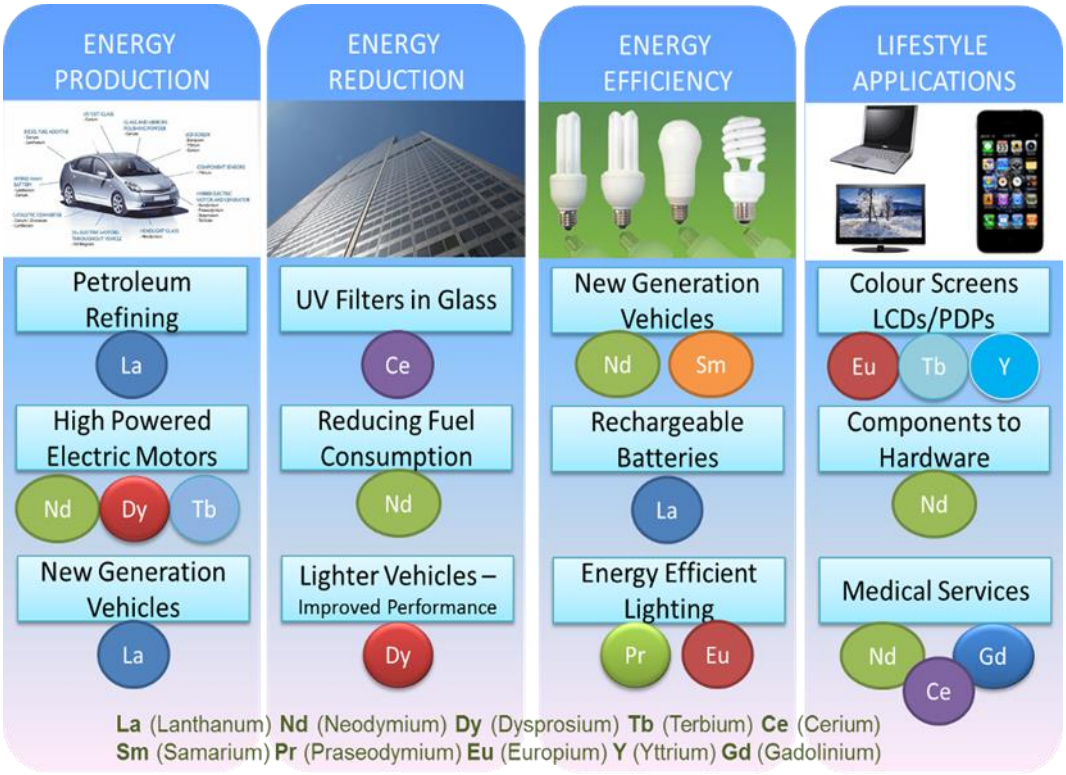

Figure 2-1: Uses of Rare Earth Elements

2.1.2 International need for supply of rare earth metals

South Africa has mined rare earth metals since the 1950s. At present, some 90 to 95% of the world’s rare earth metals are mined and produced in China, with India and South Africa also producing some rare earth concentrates. The recent growth in worldwide demand, coupled with an announcement by China that it plans to reduce its export quota, has led to a concern that the world may soon face a shortage of the rare earths. There is a widely forecasted supply deficit in REEs worldwide. This presents significant opportunities for new producers of separated rare earth operations outside of China. It is against this background that Frontier has identified a source of rare earths within South Africa and is developing the SP and associated facilities near Saldanha Bay in order to meet the global need for these minerals (CSIR, 2014).

2.1.3 Promotion of mineral beneficiation within South Africa

The Industrial Policy Action Plan (IPAP) published by the Department of Trade and Industry in 2008 constitutes a central tool in the New Growth Path (NGP) employment-creation strategy for South Africa. The publication of the 2012 IPAP: IPAP 2012/2013-14/15 provides an opportunity to take stock of the progress made and challenges experienced since the commencement of the first IPAP. The 2012 IPAP represents the fourth annual iteration of the IPAP.

It has been anticipated that the IPAP (2011/12- 2012/13 period) interventions could lead to 43 000 direct employment opportunities and 86 000 indirect employment opportunities, totalling 129 000 employment opportunities across various sectors as identified within the IPAP.

Downstream minerals beneficiation is identified as one such sector. 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, 2014).

In addition to promoting beneficiation, the proposed SRMO Project forms part of a wider employment creation opportunity starting at the proposed Zandkopsdrift rare earth mine near Garies in the Northern Cape and associated employment creation opportunities at the proposed SP and the CAH plants at Saldanha Bay (CSIR, 2014).

2.1.4 Support for national planning and strategy

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 basis 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 Bay 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 (PGDS, 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. According to the Saldanha Bay IDP of 2006 the area's economy is in the process of a major diversification away from a dependence on agriculture and fishing toward a greater reliance on manufacturing, other industry and tourism. While the IDP recognises that this holds great potential for economic growth, it also recognises that this restructuring may threaten social cohesion and increase social dislocation since locals do not have the required skill levels to be absorbed by these new sectors (SBM, 2006).

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), (SBM, 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. Based on Census 2011, the SBM had an increased unemployment rate of approximately 23.4% compared to 21.5% in 2001.This was higher than the rate for the West Coast District (14.6% unemployment) and somewhat lower compared to Saldanha Bay and Vredenburg (approximately 26% unemployment for both) as well as for Diazville (33% unemployment).

The construction and operational phase of the project would both result in spending injections that would lead to increased economic activity best measured in terms of impacts on employment and associated incomes focusing on the local area and region. Construction expenditure would constitute a positive injection of new investment. Preliminary estimates indicate that a total of approximately R113 million would be spent on all aspects of construction over 12 to 18 months.

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.

Approximately 164 temporary construction jobs with a duration 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.

The proposed SRMO Project would be a pre-requisite for the development of the SP as the latter would only be technically feasible if process effluent can be legally disposed of. The benefits associated with the SP 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 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 the REE 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).

2.1.5 Role of the SRMO project for wider projects in Saldanha IDZ

The main need for the proposed SRMO transfer system is to transport and then dispose treated industrial effluent (brine) from the proposed SSP to the sea at Danger Bay (see Figure 1-1). The effluent will be generated following the separation of saleable REEs from RE salts via solvent extraction at the SSP. This process will use hydrochloric acid and sodium hydroxide sourced directly from the proposed adjacent CAPF. The proposed SSP is, however, not solely dependent on HCl and NaOH from the CAPF as these substances can also be imported via an alternative source if necessary.

In addition to disposing of effluent originating from the SSP, the marine outfall is also needed to transport and dispose of effluent originating from the proposed CAPF and from the proposed WWTW planned for the region. It may also be used by other operations or projects within the area which require the use of the proposed SRMO transfer system in future. This may be very applicable to new industries which may be established in the area following the designation of the Saldanha IDZ.

The SBM acknowledged in a letter dated 10 February 2015 (Appendix B6 of the EIR) 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 the EIR 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 of the EIR for a letter of support from ArcelorMittal (CSIR, 2014).

2.1.6 Need and Desirability Guideline of DEA&DP

Table 2-1 below contains a list of questions from the DEA&DP Guideline (October 2011) to determine the need and desirability of the proposed project.

Table 2-1: DEA&DP Western Cape list of 14 questions to determine need and desirability including answers relevant to the proposed Saldanha Regional Marine Outfall Project

1. Question: Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved Spatial Development Framework (SDF) agreed to by the relevant environmental authority? (*i.e.* is the proposed development in line with the projects and programmes identified as priorities within the credible IDP?)	
Answer:	**Yes**
Justification:	The proposed SRMO project will not change the existing land uses of the properties that will be traversed. A large section of the proposed pipeline falls within an Industrial Corridor that will facilitate the development of the proposed Saldanha Bay IDZ. The Western Cape SDF identifies the Saldanha Bay region as having potential for the establishment of 2 Industrial Development Nodes in the future. The section of the pipeline routed south towards the marine discharge point is zoned as "Agriculture", although the Saldanha Bay Local Spatial Context indicates that the area is sensitive vegetation and bearing in mind that the area is defined as a Critical Biodiversity Area (CBA), the imperative of the site will no doubt be conservation as opposed to agriculture. Even so, the approval of this application will not compromise the integrity of any planning strategy for the region due to the nature of the project.
2. Question: Should development, or if applicable, expansion of the town/area concerned in terms of this land use (associated with the activity being applied for) occur here at this point in time?	
Answer:	**Yes**
Justification:	The proposed Industrial Development Corridor and IDZ in the region offer significant opportunity for the development of other industrial related activities that may be proposed for the region. The proposed pipeline may therefore also be utilised by other industries in future.
3. Question: Does the community/area need the activity and the associated land use concerned (is it a societal priority)? This refers to the strategic as well as local level (*e.g.* development is a national priority, but within a specific local context it could be inappropriate).	
Answer: Yes	
Justification: The 2012/13 IPAP identified 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 proposed SRMO Project will create employment opportunities directly through the construction of the pipeline and the associated infrastructure. It will also create employment opportunities indirectly at the proposed SP and at the Zandkopsdrift rare earth deposit mine near Garies as it will facilitate the operation of these industries.	
4. Question: Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development?	
Answer:	**No, nevertheless will be provided by applicant**
Justification:	Basic services including solid waste management and effluent disposal will be provided by the applicant. Electricity for the operation of the pump stations will be provided by the SBM and Eskom (see letters of

	confirmation from the SBM and Eskom in Appendices 1.4 and 1.5 respectively). The highest voltage required would be 11kV.
5. Question: Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)?	
Answer:	**Uncertain**
Justification:	The implication for infrastructure planning will be minimal considering the nature of the proposed project and the fact that basic services will mostly be provided by the applicant themselves (except for the electricity to be provided by the SBM and Eskom). 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.
6. Question: Is this project part of a national programme to address an issue of national concern or importance?	
Answer:	**Yes**
Justification:	See response to no 3 above. In addition, the Industrial Policy Action Plan (IPAP 2010 – 2014) constitutes a central tool in the New Growth Path (NGP) employment-creation strategy for South Africa. It has been anticipated that the IPAP (2011/12- 2012/13 period) interventions could lead to 43 000 direct employment opportunities and 86 000 indirect employment opportunities, totalling 129 000 employment opportunities across various sectors as identified within IPAP2. Downstream minerals beneficiation, such as is proposed at the SP is identified as one such sector. 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 (Jepson, 2012).
7. Question: Is the development the best practicable environmental option for this land/site?	
Answer:	**Yes**
Justification:	It is proposed that the SRMO pipeline will follow to a large extent the same terrestrial corridor as that proposed in the EIA for the proposed WCDM desalination plant's potable water pipeline leading to the Besaansklip reservoir. The impacts of this proposed pipeline routing have been assessed in the EIA to reduce or avoid environmental impacts as far as possible. The proposed SRMO pipeline will traverse an industrial corridor. It will also traverse a section at Danger Bay area that was used historically for sand mining and, while the greater area represents a 'Critical Biodiversity Area', this particular site has been exposed to substantial open-cast sand mining and terrestrial degradation. The disposal options 1 and 2 at Danger Bay proved to be the most feasible options in terms of environmental, technical and financial criteria following a comprehensive screening study that was completed by WorleyParsons. Specialist studies, including the supporting marine hydrodynamic modelling study, were undertaken as part of this EIA to assess potential environmental impacts to inform the outcome of the EIA process. These studies proposed mitigation measures to reduce potential negative impacts and to enhance positive impacts. These mitigations will be implemented as part of the Environmental Management Programme (EMP) of the proposed SRMO Project.
8. Question: Would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF as agreed to by the relevant authorities?	
Answer:	**No**
Justification:	The proposed SRMO Project will not change the existing land uses of the properties that will be traversed. With regard to specific spatial imperatives affecting the project, the SDF of the SBM is most relevant. The start of the SRMO pipeline would be within the IDZ at the proposed SP. Its industrial nature would thus be in keeping with the industrial surroundings. The pipeline would then largely use the servitude for the proposed WCDM desalination plant pipeline from the IDZ to the marine outfall point at Danger Bay. It is the intention that both of these projects would essentially use the same routing and associated servitude as well as the same outfall point.

	This should ensure that infrastructure is grouped and confined to specific and appropriate areas outside of the IDZ. The Jacobsbaai Western Corridor would be slightly preferable to the Eastern Corridor as it would ensure that additional pipeline infrastructure would be confined to the areas near existing linear infrastructure (primarily the Main Road and electrical transmission lines). The section of the pipeline routed south towards the marine discharge point is zoned as "Agriculture", although the Saldanha Bay Local Spatial Context indicates sensitive vegetation and bearing in mind that the area is defined as a CBA, the imperative of the site will no doubt be conservation as opposed to agriculture. Even so, the approval of this application will not compromise the integrity of any planning strategy for the region due to the nature of the project.
9. Question: Would the approval of this application compromise the integrity of the existing approved environmental management priorities for the area (e.g. as defined in Environmental Management Frameworks (EMFs), and if so, can it be justified in terms of sustainability considerations?	
Answer	**No**
Justification	The area does not have an approved EMF in place. A large section of the proposed pipeline is located in an area zoned as 'Industrial III' and will form part of the proposed 'Saldanha Industrial Corridor' and the Saldanha Bay IDZ. The SDF classifies the area leading south towards the marine disposal point as 'Sensitive Vegetation' in the Local Spatial Policy Context. A botanical assessment was undertaken as part of the EIA to avoid sensitive vegetation. It should also be borne in mind that while the greater area represents a CBA this section was historically used for sand mining and has been exposed to substantial open-cast sand mining and terrestrial degradation.
10. Question: Do location factors favour this land use (associated with the activity applied for) at this place? (this relates to the contextualisation of the proposed land use on this site within its broader context)	
Answer:	**Uncertain**
Justification:	The strategic location of Saldanha Bay and the availability of economic infrastructure in the form of a port, railway links and road networks created an opportunity for the development of the IDZ in the area. The Saldanha IDZ creates an opportunity for other industries to be established in the area. These industries may also utilise the proposed SRMO pipeline in future. The disposal option 1 at Danger Bay prove to be the most feasible site in terms of environmental, technical and financial criteria following a comprehensive screening study that was completed by WorleyParsons (Annexure 1 of Volume III). Specialist studies, including the marine hydrodynamic modelling study, were undertaken as part of this EIA to assess potential environmental impacts to inform the outcome of the EIA process. The hydrodynamic modelling study confirms that the proposed marine discharge point will facilitate rapid brine dispersion at the outfall and is therefore unlikely to result in negative impacts on marine ecology and proposed intake of seawater by the proposed WCDM desalination plant.
11. Question: How will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	
Answer:	The area from where the proposed pipeline commences, i.e. from the proposed SP to the intersection of the R85 and R399 is characterised by heavy industry and forms part of a region proposed as a potential industrial corridor. The impact on sensitive natural areas in this area is anticipated to be low. The section of the pipeline corridor routed south towards Danger Bay will traverse an area that was historically used for sand mining and is ecologically degraded. This area is still largely untransformed, and this has been exemplified by the area being determined to be "Sensitive Vegetation" in the Local Spatial Policy Context and a CBA in terms of SANBI spatial data. The impact on sensitive natural areas may be significant; however, given the degradation caused by sand mining in the past, there is scope for the development of a thorough EMP that actually promotes biodiversity conservation. A Terrestrial Ecological assessment was undertaken by Nick Helme of Nick Helme Botanical Surveys and mitigation measures were proposed to avoid or minimise impacts on natural areas (section 8.2 in Chapter 8 and the Terrestrial Ecological Report included in Appendix B of Volume II of the EIR). The impact of the proposed project on heritage resources were assessed in the archaeological and paleontological specialist studies that were be undertaken as part of the Heritage Impact Assessment for this EIA. Palaeontological and archaeological resources may be affected by the proposed development. Palaeontological impacts, in the form of disturbance or destruction of fossil material may occur anywhere along the route with the Velddrif and Prospect

	Hill Formations being most sensitive. Archaeological impacts to shell scatters and middens will occur in the western part of the study area, closest to the coast. The archaeological sites numbered JB001 and DB022 (see Section 3.6 in Chapter 3 of this report) are of concern and will require mitigation actions. Impacts to unmarked human burials are possible but unlikely. Scenic routes will experience very limited indirect temporary impacts during construction. Mitigation measures are proposed to avoid potential negative visual impacts (see Section 8.5 of Chapter 8 and the Heritage Impact Assessment (Appendix E of Volume II of the EIR).
12. Question: How will the development impact on people's health and wellbeing (e.g. in terms of noise, odours, visual character and sense of place, etc.)?	
Health and Wellbeing	There may be an impact on people's health should the brine discharge contaminate the seawater at Danger Bay and hence affect the quality of the feedwater for the proposed WCDM reverse osmosis Desalination Plant. The modelling study however indicated that this should not be the case. If the various effluent streams contributing to the outfall are regularly checked and stringently controlled to ensure compliance with water quality guidelines, and the state of the receiving environment is monitored, potential health impacts should be avoidable. If any additional effluents from future developments are proposed for the outfall, this should be thoroughly investigated to ensure that the quality of the water and sediments within the bay remain within acceptable limits.
Noise	There will be no noise impacts except during the construction phase. It is expected that noise impacts during construction will not present an immediate threat to the 'sense of place' in the region.
Odours	There should be no odour emissions from the pipeline or brine discharge.
Visual character	The visual character of the area will not be compromised as the project involves the construction of a pipeline which will be buried. The pipeline will be routed partly within an industrial corridor. A visual assessment has been undertaken by Henry Holland of Mapthis to identify potential sensitive visual receptors and to recommend mitigation measures to avoid potential negative visual impacts (see Section 8.4 of Chapter 8 and the Visual specialist study (Appendix D of Volume II of the FEIR).The visual impacts of the power lines linked to the pump stations were also assessed. The engineering team of Frontier confirmed that the effluent of the proposed SRMO will be colourless and thus no discoloration at the disposal area is expected.
General Sense of place	There should be little to no effect on one's 'sense of place' as the project involves the construction of a pipeline which will be buried and which will be routed partly within an industrial corridor. This was confirmed in the Visual Specialist study that was undertaken as part of the EIA (Appendix D of Volume II of the EIR).
13. Question: Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?	
Answer:	**Uncertain**
Justification:	Should the marine disposal of brine via the proposed SRMO pipeline lead to the contamination of sea water at Danger Bay, there will be opportunity costs associated with the project. However, if the various effluent streams contributing to the outfall are regularly checked and stringently controlled to ensure compliance with water quality guidelines, and the state of the receiving environment is monitored, potential health impacts should be avoidable. If any additional effluents from future developments are proposed for the outfall, this should be thoroughly investigated to ensure that the quality of the water and sediments within the bay remain within acceptable limits.
14. Question: Will the proposed land use result in unacceptable cumulative impacts?	
Answer:	**Uncertain**
Justification:	The proposed pipeline development and routing should not result in unacceptable cumulative environmental impacts. Anthropogenic activities in the coastal zone can result in complex immediate and indirect effects on the natural environment. To define the level of cumulative impact in the intertidal and subtidal environment, it is therefore necessary to look beyond the environmental impacts of the current project and consider also the influence of other past or future developments in the area. Danger Bay is largely undeveloped at present and to the best of our knowledge there are currently no other discharges into the bay other than rainwater runoff. Without knowledge of proposed future developments in the immediate vicinity of the bay, the cumulative impacts over the long term associated with the proposed regional marine outfall itself are difficult to predict. If the various effluent streams contributing to the outfall are regularly checked and stringently controlled to ensure compliance with water quality guidelines, and the state of the receiving environment is monitored, potential cumulative impacts should be avoidable. If any additional

	effluents from future developments are proposed for the outfall, this should be thoroughly investigated to ensure that the quality of the water and sediments within the bay remain within acceptable limits.

2.2 Project Location and immediate surroundings

2.2.1 Magisterial District and Municipality

The site falls within the jurisdiction of the Saldanha Bay Local Municipality (SBLM) and the West Coast District Municipality (WCDM) within the Western Cape Province (Figure 2-2). The proposed SRMO Project will be located near the town of Saldanha, as presented in Figure 2-2. The proposed pipeline will be constructed from the proposed SP (marked as no. 1 in Figure 1-5) and will align with the Jacobsbaai Road (R85) south-west of the SP before turning south to the discharge point at Danger Bay. An alternative route was investigated as part of the EIA. The preferred corridor option will be referred to as the Jacobsbaai Western Corridor (blue pipeline routing in Figure 3-3). The alternative route will be referred to as the Jacobsbaai Eastern Corridor[1] (purple pipeline routing in Figure 3-1) The alternative option, however was later found to be a non-feasible option due to a lack of landowner consent as noted in Chapter 1 of the EIR report.[1] The pipeline section leading to the discharge point will traverse degraded areas along road verges and farms previously used for agriculture and sand mining activities (along the Jacobsbaai Eastern Corridor) and more sensitive vegetation through the road reserve along the Jacobsbaai Western Corridor.

It should be noted that the alternatives above do not impact upon this application for a water use licence as the same wetland areas will be crossed by the pipeline for both the Jacobsbaai Western Corridor and the Jacobsbaai Eastern Corridor.

The coordinates for the pipeline crossings provided in this report and the attached application forms are however based on the Jacobsbaai Western Corridor pipeline route as this is the preferred and only feasible option.

1 During the EIA process for the WCDM Desalination it has emerged that certain landowners will not be amiable to negotiate the potential for registering a servitude over their properties as residential development rights were issued by the Saldanha Bay Municipality for the said properties. The WCDM (as the project proponent) had no option but to find an alternative corridor route around these erven. In light of this and following discussions with the WCDM and botanical specialist Nick Helme, it was decided that the 'Jacobsbaai Road Western Corridor' should be re-evaluated as a potential alternative in light of the fact that the proposed 'Jacobsbaai Road Eastern Corridor' has proven technically unfeasible.

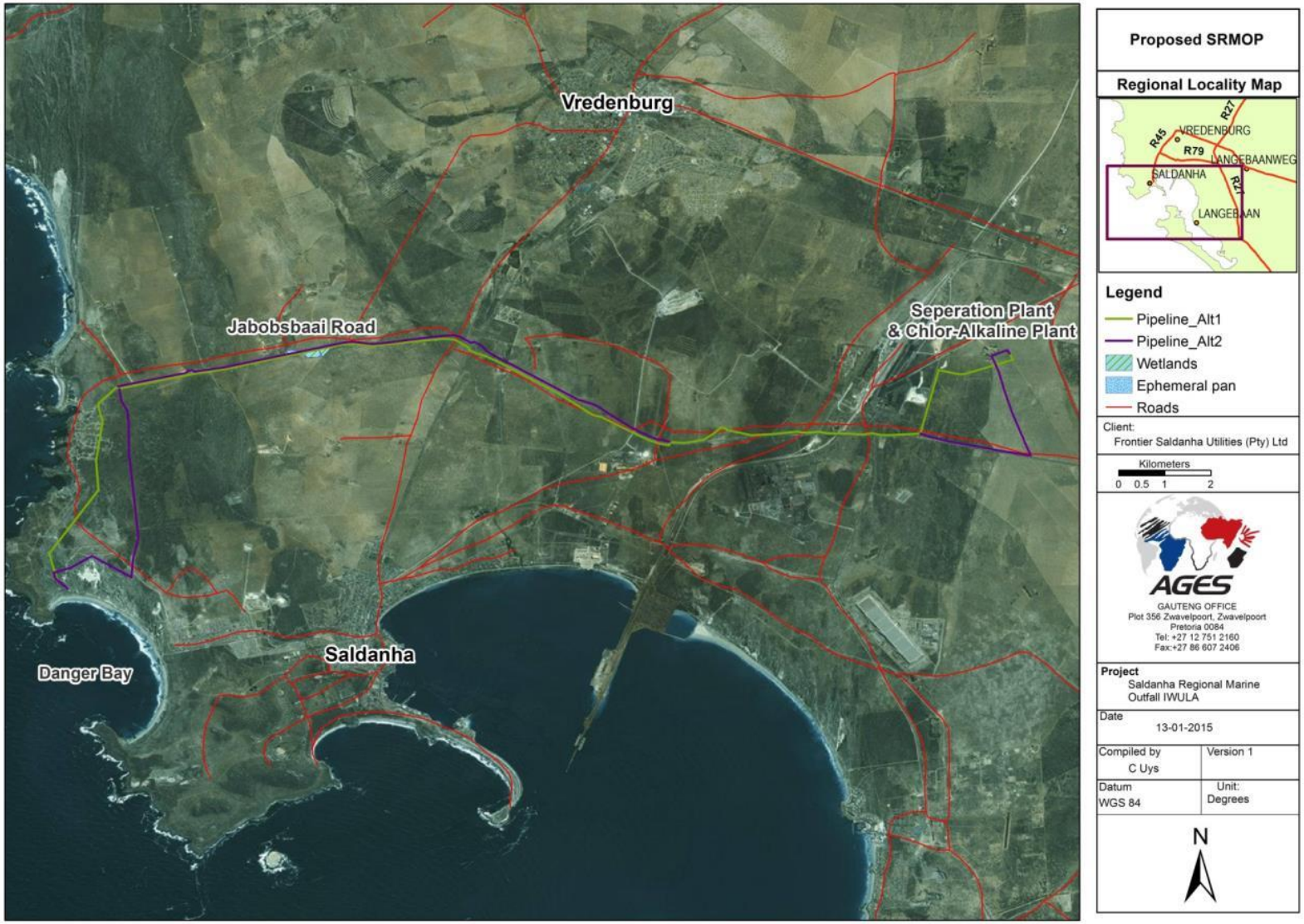

Figure 2-2: Regional Locality Map

3 PROJECT DESCRIPTION

The proposed SRMO transfer system will consist of a pipeline with transfer pump stations located along the pipeline route.

The SRMO Project will discharge approximately 8 - 9 Mega litres per day (Mℓ/day) of treated industrial effluent (Refer to Section 3.4 for the composition of the different effluent streams) generated from the following three sources into Danger Bay:

- a Rare Earth Element (REE) Separation Plant [referred to as the Saldanha Separation Plant (SP)] proposed by Frontier Separation Pty (Ltd) (EIA in progress; being undertaken by AGES, 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; being 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).

Figure 3-1 shows the overall project layout of the SRMO Project, including the different routing and marine outfall alternatives that were included in this EIA.

The treated effluent is proposed to be disposed via the brine return disposal infrastructure of the proposed WCDM desalination plant. However, the possibility exists that construction of the desalination plant might be delayed. Consequently, this EIA for the proposed SRMO Project investigates an alternative sea disposal option for sea disposal option for interim effluent (Scenario 1) until the WCDM desalination plant is commissioned (Scenario 2) — after which 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 be undesirable to have two marine outfalls located within Danger Bay due to cumulative environmental impacts).

Frontier Utilities had to identify suitable marine pipeline routing alternatives and associated marine discharge points in Danger Bay for Scenario 1 (see Screening study in Annexure 1 of Volume III of the EIA Report compiled by the CSIR). The preferred options for marine disposal were determined to be Options 1 (Preferred) and 2 (Alternative) (Figure 3-3) and continues directly south towards the sea after the SRMO pipeline reaches the site of the proposed WCDM desalination plant.

The section below provides a description of the terrestrial pipeline and marine outfall and its associated infrastructure, the pipeline routing and the composition of the effluent.

3.1 Pipeline design principals

The following design principles were incorporated into the design of the effluent pipeline:

- The SRMO pipeline route will follow a portion of the terrestrial corridor route selected for the WCDM desalination plant EIA fresh water pipeline route from Danger Bay (as part of the WCDM desalination EIA,) to the Besaansklip Reservoir. During the WCDM desalination EIA, significant advancements in the understanding of the ecologically feasible and unfeasible pipeline corridor options were determined and it is from this point of departure that this SRMO EIA was initiated. In total, approximately 21.5 km of the proposed pipeline corridor was

surveyed as part of the WCDM desalination EIA. As part of the SRMO EIA an additional 7 km was investigated (from the SP to the Besaansklip Reservoir Road). In addition an alternative routing of the pipeline to follow either the proposed Jacobsbaai Western Corridor or the Jacobsbaai Eastern Corridor[2], as per Figure 3-3, was investigated in the EIA;

- Frontier Utilities investigated alternative routings for the sea outfall infrastructure (see section 2.3.2 below). Option 1 (Preferred) and Option 2 (Alternative) in the north-west corner of Danger Bay were selected based on technical and environmental screening criteria (Annexure 1 of Volume III of the EIR);
- Five pump stations to be located along the pipeline corridor (Pumps stations A-E as indicated in Figure 3-1). It is estimated that each transfer pump station will require 315 kVA. The SBM confirmed that the 11 kV Transnet feeder has the necessary capacity to supply the required electricity to the pump station at Position C (see letter from SBM in Appendix B2). Eskom will provide electricity to the pump station at Position A and B (see letter from Eskom in Appendix B3). The SBM will provide electricity to the other three pump stations, i.e. at Positions C, D and E.
- A transfer tank at each pump station (with a volume of 15 m³) will serve as a surge and mixing tank for effluent from the current three participants of the SRMO Project (i.e. the proposed SP, the CAPF and the WWTW);
- The SRMO pipeline will extend from the pump station at the proposed SP site to the proposed interim disposal site (Scenario 1) or the proposed WCDM desalination plant outfall (Scenario 2) via a number of transfer pump stations along the route;
- The positioning of the final pump station located at (or near) the proposed WCDM desalination plant and the marine disposal pipeline site (Pump station E;); and
- The pipeline design excluded the transfer and disposal of effluent by future operations other than from the proposed SP, CAPF, WWTW and the WCDM desalination plant. It is envisaged that future disposal into the SRMO will be subjected to additional technical feasibility studies (i.e. effluent dispersion modelling), amendments, and new Environmental Authorisations that will be required for additional effluent outputs.

3.2 Details of pipeline outfall options:

The total length of the pipeline (from the high water mark to the point of discharge):

- For Option 1 (Preferred) =458 m
- For Option 2 (Alternative) =365 m

The shortest straight line distance from the high water mark to the discharge point:

- For Option 1(Preferred) =440 m

2 During the EIA process for the WCDM Desalination it has emerged that certain landowners will not be amiable to negotiate the potential for registering a servitude over their properties as residential development rights were issued by the Saldanha Bay Municipality for the said properties. The WCDM (as the project proponent) had no option but to find an alternative corridor route around these erven. In light of this and following discussions with the WCDM and botanical specialist Nick Helme, it was decided that the 'Jacobsbaai Road Western Corridor' should be re-evaluated as a potential alternative in light of the fact that the proposed 'Jacobsbaai Road Eastern Corridor' has proven technically unfeasible.

- For Option 2 (Alternative) =365 m

The depth of the discharge point (i.e. the depth at the end of the pipeline):

- 10 m below MSL

3.3 Terrestrial and marine pipeline description

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 environmental authorisations not investigated as part of this EIA). The terrestrial pipeline will be approximately 27 km long from the SP to the outfall in Danger Bay. The pipe will most likely be constructed from High density polyethylene (HDPE) or will be a glass reinforced plastic (GRP) pipe. The proposed terrestrial pipeline will be buried to minimize the risk of theft, vandalism and veld fire damage. The marine outfall will be low pressure mains and constructed in accordance with SABS 1200. The marine disposal pipeline will 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. Some excavation of underlying rock may be required for the burial of the pipeline through the beach, surf and offshore areas, which may necessitate the use of blasting methods.

3.4 Composition of effluent stream

The anticipated composition of the proposed SSP, CAPF and regional WWTW effluent stream, is provided in the section below:

3.4.1 Proposed Saldanha Separation Plant

The anticipated composition of the effluent generated by the proposed SSP is contained in Table 3-1.

Table 3-1: Composition of the Effluent Generated by the Proposed Saldanha Separation Plant

Constituent	Absolute Maximum Concentration (Short Term)	Unit	Maximum Load (kg)	
			Monthly	Annual
Magnesium (Mg)	0.6	mg/l	20	180
Aluminium (Al)	2.4	mg/l	80	500
Silicon (Si)	0.6	mg/l	20	150
Calcium (Ca)	1.2	mg/l	40	300
Titanium (Ti)	1.2	mg/l	40	300
Vanadium (V)	0.06	mg/l	<10	30
Chromium (Cr)	0.12	mg/l	<10	30
Manganese (Mn)	2.4	mg/l	80	500
Iron (Fe)	2.4	mg/l	80	500
Thorium (Th)	0.06	mg/l	<10	16
Uranium (U)	0.02	mg/l	<2	10
Cobalt (Co)	0.06	mg/l	<10	30

Nickel (Ni)	0.12	mg/l	<10	35
Copper (Cu)	0.024	mg/l	<10	30
Lanthanum (La)	165.44	mg/l	3 000	5 000
Cerium (Ce)	278.08	mg/l	3 000	5 000
Praseodymium (Pr)	29.23	mg/l	900	5 000
Neodymium (Nd)	98.85	mg/l	3 000	5 000
Samarium (Sm)	13.67	mg/l	420	2 000
Europium (Eu)	3.53	mg/l	110	750
Gadolinium (Gd)	8.25	mg/l	250	1 800
Terbium (Tb)	0.95	mg/l	30	200
Dysprosium (Dy)	4.41	mg/l	140	800
Holmium (Ho)	0.76	mg/l	20	180
Zinc (Zn)	0.6	mg/l	20	150
Lead (Pb)	0.06	mg/l	<10	20
Cadmium (Cd)	0.06	mg/l	<10	20
Arsenic (As)	0.012	mg/l	<5	<10
Bismuth (Bi)	0.012	mg/l	<5	<10
Strontium (Sr)	0.6	mg/l	20	150
Barium (Ba)	0.12	mg/l	<10	35
Sodium (Na)	60	g/l	2 000	16 000
Phosphorus (P)	0.6	mg/l	20	160
Sulfate Ion (SO_4^{-2})	0.6	mg/l	20	160
Potassium (K)	0.12	mg/l	<10	30
Soap, oil & grease	2.625	mg/l	100	700
Erbium (Er)	1.764	mg/l	80	360
Thulium (Tm)	0.252	mg/l	<10	50
Ytterbium (Yb)	1.26	mg/l	50	290
Lutetium (Lu)	0.189	mg/l	<10	45
Yttrium (Y)	23.436	mg/l	750	3 000
Chloride Ion (Cl^{-1})	72	g/l	2 200	14 800
Oxalic Acid ($H_2C_2O_4$)	420	mg/l	5 000	10 000
Naphthenic acid	50	mg/l	<10 000	20 000
P_5O_7				
Kerosene				
Temperature	20^oC			
pH	5-8.5			

Note: The absolute total monthly and total annual amounts of all the individual elements, as presented in Table 2.5, will not be more than 6 000 kg and 18 000 kg respectively, except for Sodium and Chloride.

Thorium (Th) and Uranium (U) are naturally occurring elements and are present in the Zandkopsdrift REE deposit near Garies. These elements will not be allowed to be transported to the SSP and will be precipitated out at the Zandkopsdrift Mine site near Garies.

In order to monitor radioactivity in the REE salts produced at Zandkopsdrift minerals processing plant, three separate monitoring systems are planned:

- Firstly, real time online radioactive monitoring will be conducted to ensure that REE salts produced at the mine, prior to shipment to the SSP, are within legislative and acceptable limits determined during the EIA. Should the online monitoring system determine that radio activity levels are not within specification, the REE salts produced will automatically be rejected at the Zandkopsdrift minerals processing plant and not be allowed to move to the packing and transport facility.
- Secondly, manual samples will be taken of the REE salts produced at the mine during each operating shift, at predetermined intervals, and tested at a laboratory (to be determined) to confirm the results of the real time monitoring instrumentation.
- Thirdly, REE salt samples will be tested for radioactivity at the National Nuclear Regulator (NNR).

The frequency of the different radioactive assessments (real time monitoring, manual sampling and NNR assessment) will be determined during the EIA.

On receipt of a REE Salt shipment at the SSP, additional radioactive tests will be completed to confirm that the product is within the required pre-determined specification limits:

- Firstly, real-time radioactive monitoring will be installed on the materials offloading system at the SSP. Any material found not to meet the specifications will automatically be diverted for return to the Zandkopsdrift Processing Facility, thereby not being processed any further at the SSP.
- Secondly, manual samples will be taken at the SSP of the REE salts received during each operating shift, at predetermined intervals, and tested at a laboratory (to be determined) to confirm the results of the real time monitoring instrumentation.

In summary it is not expected that radioactive material will be received by the SSP and if any does it will be returned to the Zandkopsdrift minerals processing plant.

The final radioactive monitoring will be performed by real time monitoring on the brine effluent stream from the SSP to the SRMO brine transfer tank to ensure that the brine effluent entering the SRMO system is within the prescribed limits of the Environmental Authorisation of the EIA. Should the limits be breached the system will automatically prevent the brine from entering the SRMO system.

Thus the risk of any accidental discharge is obsolete due to the number of control systems at both the supply and receiving portions of the projects. In addition it is expected that any radioactive elements that may be present will not report to the brine produces but rather the REE oxide product that will affect the quality of the SSP's production. Thus any radioactive material will depreciate the quality of REE produced which would lead to revenue losses and thus is not beneficial to Frontier

Separation to allow any radioactive material into the SSP and thus the reason for the monitoring of radio activity in the feed to the SSP.

3.4.2 Chlor-Alkali Production Facility

The anticipated composition of the effluent generated by the proposed CAPF is contained in Table 3-2.

Table 3-2: Effluent Generated by the proposed Chlor Alkali Production Facility

Effluent Stream Composition (mg/l)	Absolute Maximum Concentration (Short Term)	Unit	Maximum Load (kg)	
			Monthly	Annual
pH	6 to 8			
Temperature	20	^{o}C		
Total dissolved solids	63108.14	mg/l	109127	1309519
Total suspended solids	129.97	mg/l	225	2697
Sodium (Na)	24552.8	mg/l	42457	509480
Calcium (Ca)	591.48	mg/l	1023	12273
Magnesium (Mg)	30.73	mg/l	53	638
Sulphate Ion (SO_4^{-2})	11782.25	mg/l	20374	244486
Chloride Ion (Cl^{-1})	25165.14	mg/l	43516	522187
Carbonate (CO_3)	64.50	mg/l	112	1338
Hydroxide Ion (OH^{-1})	0	mg/l	0	0
Nitrate Ion (NO_3^{-1})	11.45038	mg/l	20	238
Chlorate Ion ClO3	0	mg/l	0	0

3.4.3 Regional Waste Water Treatment Works of the Saldanha Bay Municipality

It is assumed that the proposed regional WWTW of the SBM will treat the sewage to the General Limit refer to Table 2.7 below. The RHDHV design parameters allowed for a treatment capacity of 5 Ml/d equating to 57.9 l/s. The anticipated composition of the effluent from the SBM regional WWTW is contained in Table 3-3.

Table 3-3: Composition of the Effluent Generated from the proposed Regional Waste Water Treatment Works of the Saldanha Bay Municipality

SUBSTANCE/PARAMETER		WWTW GENERAL LIMIT
Faecal Coliforms	per 100ml	1 000
Chemical Oxygen Demand	mg/l	75 (i)
pH	-	5,5-9,5
Ammonia (ionized and unionised) as	mg/l	6

SUBSTANCE/PARAMETER		WWTW GENERAL LIMIT
Nitrogen		
Nitrate/Nitrite as Nitrogen	mg/l	15
Chlorine as Free Chlorine	mg/l	0.25
Suspended Solids	mg/l	25
Electrical Conductivity	mS/m	70mS/m above intake to a max of 150mS/m
Ortho-Phosphate as Phosphorus	mg/l	10
Fluoride	mg/l	1
Soap, Oil & Grease	mg/l	2.5
Dissolved Arsenic	mg/l	0.02
Dissolved Cadmium	mg/l	0.005
Dissolved Chromium (VI)	mg/l	0.05
Dissolved Copper	mg/l	0.01
Dissolved Cyanide	mg/l	0.02
Dissolved Iron	mg/l	0.3
Dissolved Lead	mg/l	0.01
Dissolved Manganese	mg/l	0.1

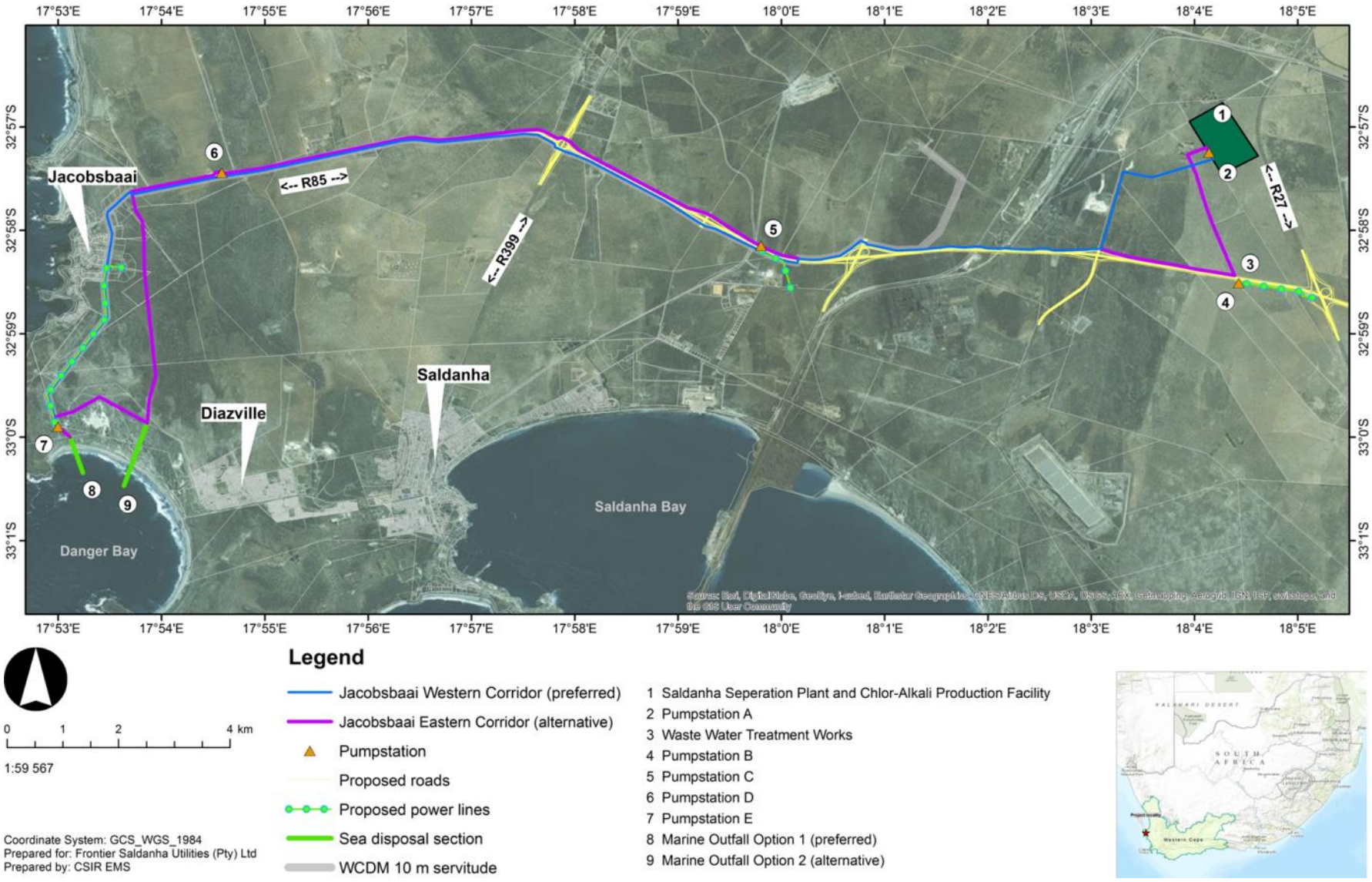

Figure 3-1: Aerial map indicating pipeline infrastructure

3.5 Alternatives

As per the Western Cape Provincial Department of Environmental Affairs & Development Planning EIA Guideline on Alternatives (DEA&DP, March 2013), the EIA Regulations require that alternatives to a proposed activity be considered. Alternatives are different means of meeting the general purpose and need of a proposed activity. This may include the assessment of site alternatives, activity alternatives, process or technology alternatives, temporal alternatives and the no-go alternative. The section below provides a summary of the alternatives that will be proposed and assessed in this EIA.

3.5.1 Marine outfall routing alternatives

A comprehensive screening study was undertaken by WorleyParsons and CSIR to identify suitable marine pipeline routing alternatives and associated marine discharge points for Scenario 11 (Annexure 1 of Volume III of the EIA report compiled by the CSIR). The study aimed to identify specific environmental, technical and financial constraints associated with the alternative pipeline routings and associated marine discharge positions.

Three potential marine outfall routing alternatives were identified i.e. Options 1, 2 and 3 (refer to Figure 3-2). It includes Option 1 (pipeline through sandy shoreline in the west of Danger Bay), Option 2 (pipeline through sandy shoreline in the centre of Danger Bay) and Option 3 (pipeline through rocky shoreline on the headland immediately west of Danger Bay (refer to Figure 3-2). Options 1 (preferred) and 2 (alternative) were deemed to be the most feasible options during the Scoping Phase, and were therefore assessed in the Marine Ecological Study (Annexure A in Volume II of the EIA Report). Marine outfall Option 3 was not deemed feasible, as the pipeline would need to cross a rocky coast, cobble terrace just above the high water mark and exposed granite east of this. The area has a very high sensitivity for both fauna and flora with low rehabilitation potential. The pipeline would traverse highly sensitive Saldanha Granite Strandveld. The marine outfall Option 3 was thus considered as a “no go” option and therefore not further assessed as part of this study. This option would also have required extensive blasting for the laying of the pipeline over the rocky coast.

More details on the marine outfall routing alternatives and its locations are provided in Section 2.3.2 in Chapter 2 of the EIA Report compiled by the CSIR.

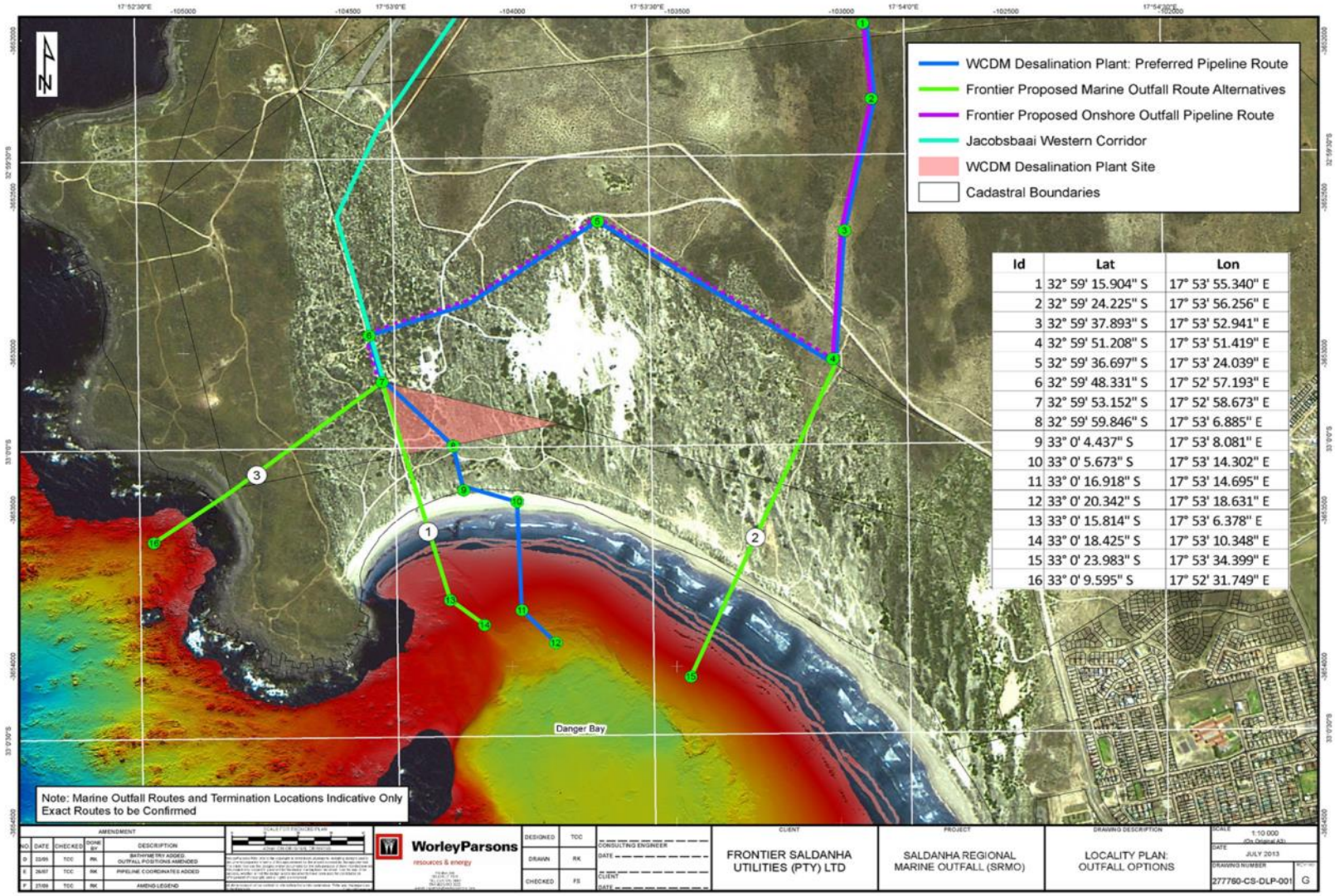

Figure 3-2: Infrastructure map indicating marine outfall alternatives

3.5.2 Pipeline routing alternatives

As mentioned previously, it is proposed that the SRMO transfer pipeline will follow to a large extent the same terrestrial corridor as that proposed in the EIA for the proposed WCDM desalination plant. In the Final Environmental Impact Assessment Report (FEIR) of the WCDM desalination plant, the 'Jacobsbaai Road Eastern Corridor' alternative represented 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 SRMOP.

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. The SRMO Project Draft Scoping Report therefore did not include this corridor as an alternative pipeline routing option.

Subsequent to discussions between WorleyParsons (on behalf of the WCDM) and landowners along the Jacobsbaai Eastern Corridor it has emerged that certain landowners will not be amiable to negotiate the potential for registering a servitude over their properties as residential development rights were issued by the Saldanha Bay Municipality for the said properties. The WCDM (as the project proponent) has no option but to find an alternative corridor route around these erven. In light of this and following discussions with the WCDM and botanical specialist Nick Helme, it was decided that the Jacobsbaai Western Corridor should be re-evaluated as a potential alternative in light of the fact that the proposed 'Jacobsbaai Road Eastern Corridor' has proven technically unfeasible. The CSIR has therefore lodged an application for an EA Amendment on 15 August 2014 to DEA&DP on behalf of WCDM. It is currently out for a 40-day commenting period 26 August – 06 October 2014. Following this, an additional 21-day commenting period will be allowed for. In this Amendment application the Jacobsbaai Road Western Corridor was re-evaluated and was put forward as the preferred pipeline routing alternative.

While the proposed Jacobsbaai Western Corridor was initially established as a no-go area when investigating corridor routing alternatives, it has to be considered that no-go areas (like any sensitivity mapping process) is about balancing trade-offs of environmental impact. As the 'Jacobsbaai Road Eastern Corridor' and 'Afrisam Corridor' have proved unfeasible subsequent to the EA for the WCDM desalination plant, the botanical specialist has agreed to reconsider the no-go status on the Jacobsbaai Road Western Corridor as part of the proposed EA Amendment.

In light of this, an additional alternative, the Jacobsbaai Road Western Corridor, was included in the Final Scoping Report and was assessed in the EIA phase of the SRMO Project (see Figure 1-2). Frontier Utilities and the WCDM wish to have their pipelines within the same corridor for environmental and technical reasons. This is considered to be the preferred and only pipeline routing option for the SRMO Project. This pipeline routing was assessed in the Terrestrial Ecological specialist study undertaken by Nick Helme. The study concluded that the both proposed pipeline routes (Jacobsbaai Western and Eastern Corridors) will have some negative botanical impacts which cannot be avoided or mitigated. Without mitigation the Jacobsbaai Western corridor will have a High negative botanical impact, which could be reduced to Medium negative with mitigation, or Low – Medium negative with a suitable biodiversity offset. 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.

Thus if rerouting of a portion of the Jacobsbaai Western Corridor is undertaken as

mentioned above, and all mitigation is put in place then there is no strongly preferred routing alternative from a botanical perspective.

3.5.3 Technological alternatives for brine disposal

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

a) disposal of brine 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 are mainly technical and financial, but some environmental criteria were also considered, e.g. visual impacts, ground water contamination, land sterilisation, air emission impacts etc. This led to the marine disposal alternative being selected as the only option considered feasible at this point.

The following conclusions and recommendations are made in the desktop trade-off study:

- disposal via any of the existing WWTWs is not possible due to the high salt concentration of the effluent being detrimental to the WWTW's bacterial breakdown process;
- evaporation ponds will require 45 hectares (ha) of ponds though 60 ha of land will have to be purchased for this option. The size and extent of the ponds will have a high visual impact on the area and ground water contamination will be a concern. Both the evaporation ponds and crystalliser options will produce 57 000 tons/year of waste salt (Phase 1 of the SP);
- CAH have indicated that they would accept moist salt provided that the heavy metal ions were reduced to <0.05 mg/l. This can be produced, however, it will also produce a salt precipitate requiring licensed disposal which has not been identified; due to Vissershok (the nearest licensed disposal site to Saldanha), not being willing to accept the waste salt (refer to letter dated 14 August 2013 in Appendix A of Annexure 3 of Volume III), the evaporation pond and both crystalliser options are not realistically feasible options;
- disposal by pipeline to a sea outfall is the lowest capital, lowest operating cost and least environmental impact at this stage of the study;
- effluent brine can be processed to precipitate metals to reduce the non-NaCl load on the effluent going to sea provided the precipitated salts can be disposed of in a licenced facility. However, such a facility has not yet been identified;
- it was thus determined that the most feasible solution is to dispose of the brine to sea; and
- in the event that there are objections to the composition of the effluent brine

(not falling within the guidelines e.g. DWAF 1995; ANZECC 2000 or others that may be applicable), polishing of the brine by metals precipitation should be pursued provided that the precipitated sludge can be disposed of to a licensed disposal facility. Use of lime as the alkali seems possible and should be further investigated.

3.5.4 Alternative electrical infrastructure options

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; or, alternatively, Medium Over Head Line (OHL) in traditional Delta A-Frame positions (wooden poles), at a height of 12 m, will be used. The SBM has confirmed in their letter dated 7 July 2014 that they will supply electricity to the 3 x 250 kVA pump stations intended to supply electricity to the proposed desalination plant of the WCDM (Appendix B2 of the EIR). Eskom has also confirmed in their letter dated 27 August 2014 that they will provide electrical supply of 250 kVA from their network to the proposed pump station at Site B at Langebaan. They noted that they have spare capacity at their substation at Langebaan for the pump station (Appendix B3 of Volume I of the EIR).

3.5.5 Alternative road infrastructure options

Two alternative access roads were evaluated (Figure 3-3):

- Alternative A – 1.44 km west of the TR77_1/TR85_1 intersection
- Alternative B – 2.84 km west of the TR77_1/TR85_1 intersection

ITS Engineers compiled a conceptual Access Management Plan for the industrial area during 2008, while in 2013 AECOM prepared a Road Network Plan for the Saldanha Municipal Area. Initial planning by ITS for access to the SP made use of Access Alternative A. However, due to AECOM's planning of the TR85/1 as an abnormal truck route with limited interchange access only, Alternative A were not supported by the Provincial Roads Authority. Based on the above Road Network Plan, Alternative B will be the preferred access.

At the time of completion of the Traffic Impact Assessment study the access position had been confirmed as that of Alternative B. All the intersections of Route Alternative B are currently operating at acceptable Levels-Of-Service (LOS) during all peak periods. Therefore no upgrades are proposed from an intersection capacity point of view. The available Shoulder Sight Distance (SSD) at both access alternatives was evaluated. The TR85/1 is relatively straight and flat and therefore a SSD of more than 300 meters is available. The servitude for the proposed access road will be 25 metres wide, which should be sufficient to accommodate further development on the larger property. Please note that the authorisation of the above access road is subject to a separate Basic Assessment Process (DEA&DP Reference: E12/2/4/1-F4/22-3001/12).

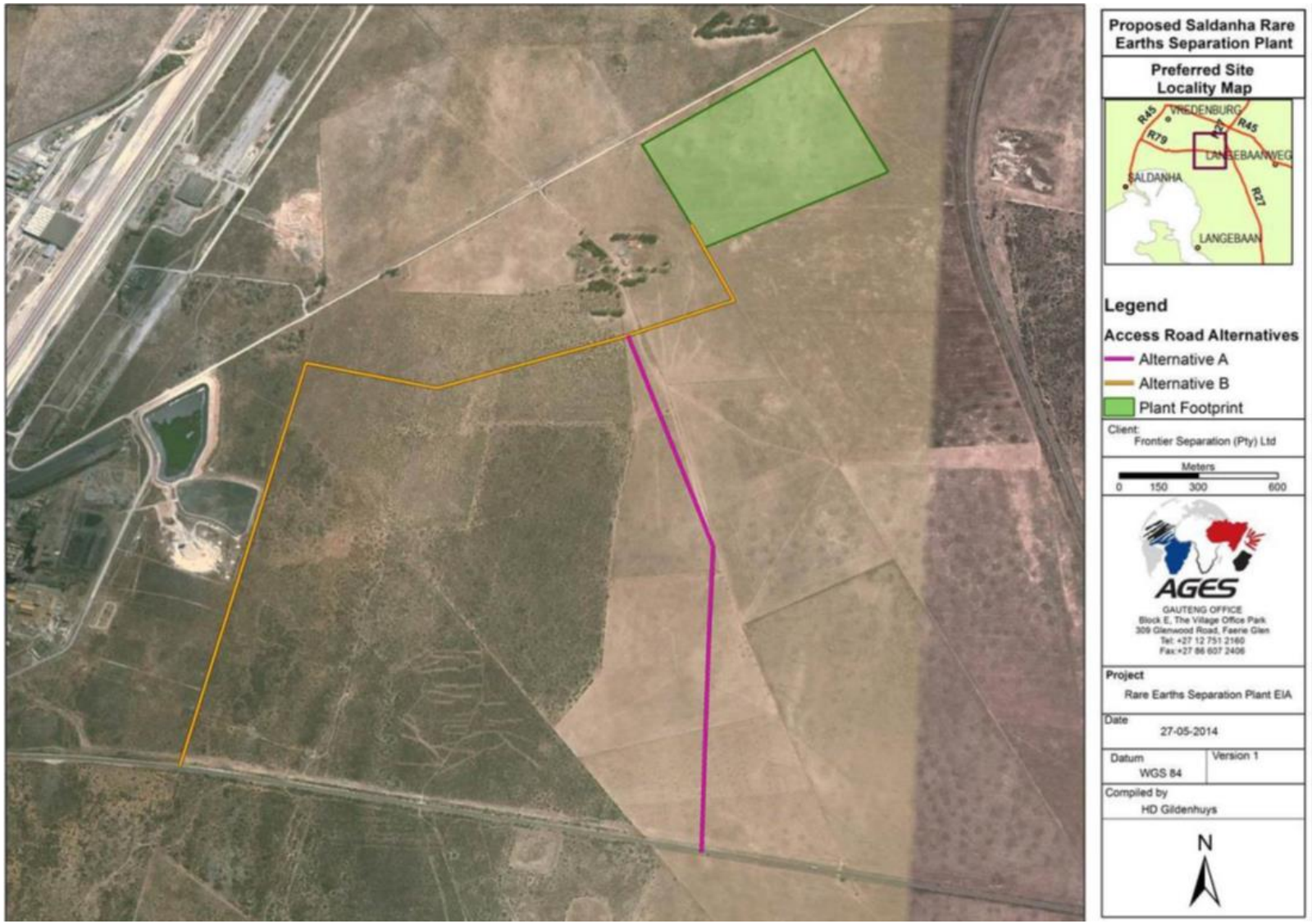

Figure 3-3: Alternative Access Road Route Alignments which were evaluated

4 LEGISLATIVE FRAMEWORK AND APPLICATION PROCESS

Section 24 of the Constitution of the Republic of South Africa (Act No 108 of 1996), states that everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations. To this end, legislation is continuously in the process of being promulgated to prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

4.1 Authorizations, Licenses and Permits associated with the project

Table 4-1 presents a summary of the relevant authorizations, permits and licenses that the project will require prior to commencement. All of the relevant legislation is not discussed in detail in this report. This report will only focus on the most pertinent legislation in terms of environmental impact management and water use licensing associated with the project.

For a full discussion of the environmental-legal requirements associate with this project, please refer to Chapter 4 of the EIA Report (Please refer to Chapter 4 of the EIR).

Table 4-1: Authorizations, licenses and permits required for the project

TYPE OF AUTHORISATION REQUIRED	COMPETENT AUTHORITY	REASON FOR AUTHORISATION
The National Environmental Management Act (No. 108 of 2008) General Environmental Authorisation	Western Cape Department of Environmental Affairs and Development Planning: Land Management	The proposed SRMO Project includes listed activities that require full Scoping and Environmental Impact Reporting (S&EIR) in terms of GN.R545, and includes listed activities which require basic assessments in terms of GN.R544 and GN.R546.
Integrated Coastal Management Act (No. 24 of 2008). Coastal Waters Discharge Permit	Department of Environmental Affairs Oceans and Coasts: Coastal Pollution Management	A concentrated brine solution with additional chemical constituents will be discharged into the sea.
The Sea-Shore Act (No. 21 of 1935). A lease for the portion of the sea-shore below the high water mark will need to be obtained	Western Cape Department of Environmental Affairs and Development Planning and/or Cape Nature	Sea pipeline intake and discharge facilities will traverse the sea-shore below the high water mark. A maximum of a 20 year lease with the potential for renewal will be applied for.
Servitudes for pipelines that traverse state owned land above the high water mark need to be applied for by Frontier Utilities	Department of Public Works	Terrestrial pipelines will traverse state owned state above the high water mark and authorisation for this will need to be obtained from the National Department of Public Works to register the servitude within this region of the coast.
National Environmental Management Act (No. 107 of 1998) GN. Regulation 1399:	Department of Environmental Affairs: Coastal Management Unit	The development of the pipeline traversing the sea shore will require an Off Road Vehicle licence in accordance with Regulation 1399.

Regulations for the control of Vehicles in the Coastal Zone. Permission required		
A Permit to remove rare plant species if present	Cape Nature	Rare and endangered plant species may need to be relocated for the routing of the pipeline. Authorisation to undertake this activity will need to be obtained from the competent authority.
The National Heritage Resources Act (NHRA No. 25 of 1999)	Heritage Western Cape	The construction of the terrestrial pipeline may have the potential to excavate, alter of remove archaeological, palaeontological and historical material or objects. This should not be done without a permit issued by Heritage Western Cape
National Water Act (No. 36 of 1998) Integrated Water Use License Application (IWULA)	**Department of Water Affairs: Western Cape**	**There is the potential that the terrestrial pipeline may traverse areas within 500 m of wetlands. A Water Use License Application 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.**

4.2 The National Environmental Management Act (107 of 1998) (NEMA) and the Environmental Impact Assessment Regulations, 2010

In order to ensure that the environmental rights contemplated in Section 24 of the Constitution are realised, the NEMA sets out the provisions which are to give effect to the general objectives of Integrated Environmental Management (IEM), and provides the statutory mechanism of issuing environmental authorisations for the undertaking of activities that are listed in terms of the NEMA, which follow after the undertaking of an environmental impact assessment process.

Application for environmental authorization in terms of the project has been initiated. The Draft Environmental Impact Assessment Report (DEIR) was under public review as per the NEMA Regulations of 2010, until Tuesday 2 December 2014, after which the DEIR was updated with comments received. The Final EIR along with the IWULA will be submitted to the Department of Environmental Affairs and Development Planning (DEA&DP) and the Department of Water and Sanitation (DWS) for consideration. The following project reference numbers apply:

- DEA&DP Reference: 16/3/1/2/F4/17/3009/13
- DEA:O&C Reference: 2014/016/FRONTIER SALDAHNA

Once the DEA&DP has made a decision with regards to the NEMA application, the DWS will also be informed of this decision.

4.3 National Water Act (Act No 36 of 1998) (NWA)

The purpose of the NWA, as set out in section 2 thereof, is to ensure that the country's water resources are protected, used, developed, conserved, managed and controlled, in a way which, inter alia, takes into account the reduction and prevention of pollution and degradation of water resources.

A person may only use water without a license if

- such water use is permissible under Schedule 1, or
- if that water use constitutes a continuation of an existing lawful water use, or
- if that water use is permissible in terms of a general authorisation issued under section 39, or
- if a responsible authority waives the need for a licence, or
- if the water use has been authorised by a license issued in terms of the NWA.

This report is prepared in terms of an application for an integrated water use license (IWUL) in terms of the NWA for water uses specified herein

Refer to section 5 for detailed descriptions of the water uses applied for.

4.4 General Authorizations and Schedule 1 Water Uses

In terms of GN 1199 of 18 December 2009, the following water uses are excluded from general authorisations for impeding or diverting the flow of or altering the bed, banks, course or characteristics of a watercourse:

- the use of water in terms of section 21 (c) and (i) within a 500 metre radius from the boundary of any wetland;

The proposed pipeline in some cases traverses or occurs within 500 m of two wetlands and therefore an Integrated Water Use Licence (IWUL) must be applied for.

4.5 The Water Services Act (WSA) (ACT 108 of 1997).

The main aspects of the Water Services Act relevant to land-based pressures on the marine environment include:

- Right of access to basic water supply and basic sanitation necessary to secure sufficient water and an environment not harmful to human health or well-being;
- Management and control of water services, in general, including water supply and sanitation; and
- Regulation of industrial use of water, both in terms of use and disposal of effluent (possible overlap with Section 21 of the NWA).

4.6 The Integrated Coastal Management Act (Act 24 of 2008) (ICM)

The sections of the ICM (2008) specifically designed to deal with the leasing of state land in the coastal zone are provided for in the Act; however, they have not officially come into effect and this authorisation procedure still falls under the ambit of the Sea Shore Act (Act 21 of 1935). The most applicable component of the ICM (2008) is section 63 "Environmental authorisations for coastal activities" which deals with EIA's where the following is discussed.

63. (1) "Where an environmental authorisation in terms of Chapter 5 of the National Environmental Management Act is required for coastal activities, the competent authority must take into account all relevant factors, including –

(a) the representations made by the applicant and by interested and affected parties;
(b) the extent to which the applicant has in the past complied with similar authorisations;

(c) whether coastal public property, the coastal protection zone or coastal access land will be affected, and if so, the extent to which the proposed development or activity is consistent with the purpose for establishing and protecting those areas;
(d) the estuarine management plans, coastal management programmes and coastal management objectives applicable in the area;
(e) the socio-economic impact if the activity -
(i) is authorised;
(ii) is not authorised;
(iii) the likely impact of the proposed activity on the coastal environment including the cumulative effect of its impact together with those of existing activities;

(g) the likely impact of coastal environmental processes on the proposed activity; and

(h) the objects of this Act, where applicable.

(2) The competent authority may not issue an environmental authorisation if the development or activity for which authorisation is sought -

(a) is situated within coastal public property and is inconsistent with the objective of conserving and enhancing coastal public property for the benefit of current and future generations;

(b) is situated within the coastal protection zone and is inconsistent with the purpose for which a coastal protection zone is established as set out in section 17;

(c) is situated within coastal access land and is inconsistent with the purpose for which coastal access land is designated as set out in section;

(d) is likely to cause irreversible or long-lasting adverse effects to any aspect of the coastal environment that cannot satisfactorily be mitigated;

(e) is likely to be significantly damaged or prejudiced by dynamic coastal processes;

(f) would substantially prejudice the achievement of any coastal management objective; or

(g) would be contrary to the interests of the whole community.

(3) Notwithstanding subsection (2). The competent authority may issue an environmental authorisation in respect of an activity or a development that does not meet the criteria referred to in subsection (2)(a). (b) or (c) if—

(a) The very nature of the proposed activity or development requires it to be located within coastal public property, the coastal protection zone or coastal access land; or

(b) the proposed activity or development will provide important services to the public when using coastal public property, the coastal protection zone, coastal access land or a coastal protected area.

(4) If an application for an environmental authorisation cannot be approved by the competent authority because of a provision of subsection (2), but the competent authority believes that issuing the authorisation would be in the public interest, the competent authority may refer the application for consideration by the Minister in terms of section 64. 5

(5) The competent authority must ensure that the terms and conditions of any environmental authorisation are consistent with any applicable coastal management programmes and promote the attainment of coastal management objectives in the area concerned.

(6) Where an environmental authorisation is not required for coastal activities, the 10

Minister may, by notice in the Gazette list such activities requiring a permit or licence".

4.7 The Sea Shore Act (Act 21 of 1935)

The Sea-shore Act provides that ownership of the sea-shore (which includes the water and land between the low-water mark and the high-water mark in those estuaries that fall within the definition of “tidal lagoons” and/or “tidal rivers”) and the sea, vests in the State President insofar as it was not privately owned before the commencement of the Act (which occurred on 10 April 1935). All of the provisions of the Act have been assigned to the four coastal provinces under section 235(8) of the Constitution, except in so far as the Act regulates the sea-shore and the sea within ports or harbours (Proclamation R27/16346/6 dated 7 April 1995). This Act will govern leasing of land from the State over the shore (State owned land) (CSIR, 2014).

4.8 The Maritime Zones Act (Act 15 of 1994)

The Act provides for the demarcation of maritime zones of the Republic (e.g. internal waters, territorial waters, contiguous zone, maritime cultural zone, exclusive economic zone, continental shelf) and to provide for matters relating to installations, maritime casualties and self-defence.

5 WATER USES

5.1 Process followed

This document will form part of the supporting documentation for an Integrated Water Use Licence Application for the proposed pipeline. To ensure compliance with the NWA, the process illustrated in Figure 5-1 was followed.

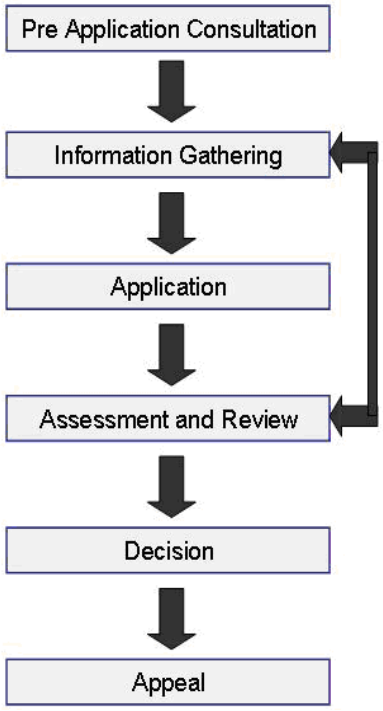

Figure 5-1: Water Use Licensing Application Process (DWS, 2007)

5.2 Technical and supporting documentation

The following documents accompany this application:

Table 5-1: Supporting Documents

Application forms	Appendix A
Proof of payment	Appendix B
EIA report and EMPr	Attached EIR
Wetlands Study Report	Appendix C of EIR
Title deeds	Appendix C
Certified Copy of ID	Appendix D
Business Registration Certificate	Appendix E

5.3 Application forms

Application forms are contained in Appendix A and summarized in Table 5-2 below.

Table 5-2: Application Forms associated with this application

Form/Water use	Description	Document reference
Registration	Registration	DW758
Supplementary	Property detail	DW901
	Property owner detail	DW902
Section 21c Section 21i	Impeding or diverting flow of water in a watercourse – construction of a pipeline, crossing Wetland 1 Altering the bed, banks or characteristics of a watercourse – construction of a pipeline, crossing Wetland 1	DW763 DW768
	Impeding or diverting flow of water in a watercourse – construction of a pipeline, crossing Wetland 2 Altering the bed, banks or characteristics of a watercourse – construction of a pipeline, crossing Wetland 2	DW763 DW768
	Supplementary Water Use Information for Section 21 (c) and (i) water uses	DW781 DW775

5.4 Proposed water uses that require licensing

Various water uses associated with the project will require water use licensing and/or registration in terms of Section 21 of the NWA. To follow is a brief summary of the water uses to be licensed as well as relevant information regarding the specific water use. Each of these water uses are discussed in more detail in the following subsections.

Table 5-3: Water uses requiring licensing

Water use	Action	Feature	Water use
21 (c)	Impeding watercourses	Construction of pipeline within 500m of Wetland 1 and 2	Impeding or diverting of a watercourse
21 (i)	Altering the bed, banks, course or characteristics of a watercourse	Construction of pipeline within 500m of Wetland 1 and 2	Altering the bed, banks, course or characteristics of a watercourse

5.4.1 Section 21c and 21i: Impeding or diverting of a watercourse; and altering the bed, banks or characteristics of a watercourse in terms of the NWA

The proposed SRMO transfer system will consist of a pipeline with transfer pump stations located along the pipeline route. The proposed pipeline will have a diameter of approximately 900 mm and will be approximately 27 km long from the SP to the outfall in Danger Bay. The pipe will most likely be constructed from High density polyethylene (HDPE) or will be a glass reinforced plastic (GRP) pipe. The proposed terrestrial pipeline will be buried to minimize the risk of theft, vandalism and veld fire damage. The marine outfall will be low pressure mains and constructed in accordance with SABS 1200. The marine disposal pipeline will 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. Some excavation of underlying rock may be required for the burial of the pipeline through the beach, surf and offshore areas, which may necessitate the use of blasting methods.

Two aquatic ecosystems that may be affected by the SRMO and associated infrastructure were identified along the Jacobs Bay road in the WCDM 10 m servitude. Both pipeline routing alternatives follow the same route along this section of the pipeline.

However due to the impacts associated with the delineated Wetland 1 on the southern side of the Jacobsbaai Road, it is proposed that the pipeline and electrical corridor will be routed along the northern section of the Jacobsbaai Road through the disturbed portion of an ephemeral pan.

In the case of Wetland 2, comprising the Bok River valley bottom wetland, installation of the pipelines would impact on the wetland over a highly localised area. As the proposed corridor development will occur within 500 m of these wetlands, an Integrated Water Use Licence Application (IWULA) will need to be submitted to the Department of Water and Sanitation (DWS). Activities associated with the pipeline construction will involve the excavation of a pipeline trench, stockpiling of excavated soil and compaction over the pipelines.

The general coordinates for the start, middle-and end-point for the proposed pipeline are as follows:

	Latitude (S)	**Longitude (E)**
• Starting point of the activity	32°57’25.93“	18°3‘18.73“
• End point of the activity		
– Option 1	33°0’18.43’’	1°6’49.65’’
– Option 2	33°0’23.98	1°6’25.60’’
– Option 3	33°0’20.34’’	1°6’41.37’’

Datum: WGS84

The general coordinates for the pipeline infrastructure which is proposed to be constructed within 500m of Wetland 1 and 2 and for which a water use licence is required is provided in Table 5-4 below:

Table 5-4: Water use per property for preferred pipeline route alignment alternative

Water use	Description	Property	Latitude (S)	Longitude (E)	No. on map
21c & i	Wetland 1 Crossing start	Jacobs Bay 109	32°57’12.62’’	17°55’52.05’’	W1_S
21c & i	Wetland 1 Crossing end	Jacobs Bay 109	32°57’14.71’’	17°55’41.69’’	W1_E
21c & i	Wetland 2 Crossing start	Phillips Kraal 125	32°57’2.67’’	17°57’24.25’’	W2_S
21c & i	Wetland 2 Crossing end	Phillips Kraal 125	32°57’2.71’’	17°57’23.07’’	W2_E

- The crossings at both the wetland will involve the following construction activities:
- Removal of topsoil and stockpiling
- Trench excavation
- Laying of pipe on imported stone bedding or concrete encasement if required
- Backfilling and compacting
- Construction of gabions on sides of pipeline and Reno mattresses on top of pipeline if required
- Replacement of in-situ excavated topsoil

The proposed pipeline crossings are conceptually illustrated in Figure 5-2.

5.4.2 Discharge of effluent in terms of the ICM

In terms of the ICM Act of 2008 a Coastal Waters Discharge Permit (CWDP) will be required from the Department of Environmental Affairs: Oceans and Coasts (DEA:O&C): Coastal Pollution Management. This permit will regulate the disposal of brine into the marine environment. An actual permitting procedure has not been implemented and as it stands at present: an applicant is permitted to release effluent into the marine environment once a formal application has been lodged (i.e. a decision on the permit or the permit itself is not required and the application itself is sufficient for interim measures). The Department of Environmental Affairs is in the process of formulating permitting and monitoring requirements for the formal issuing of the CWDP. Some of the criteria for applying for a CWDP will only be known after the EIA and detailed design phases are complete. For example, the following criteria are considered for the issuing of a CWDP:

- Scope of study area and features;
- Biogeochemical processes (water column and sediment);
- Marine ecology;
- Microbiological Factors;
- Hydraulic design;
- Achievable dilution;
- Sedimentation/re-suspension of solid phase particles;
- Compliance with environmental quality objectives;
- Pipeline construction and design;
- Monitoring programmes; and
- Contingency Planning.

In terms of Section 69 of the ICM Act anyone who wishes to discharge any effluent into the coast must apply to DEA for a Coastal Waters Discharge Permit (CWDP). An application for a CWDP dated 10 September 2014 was submitted to DEA: O&C by the CSIR on behalf of Frontier Utilities. DEA: O&C has issued the reference number: “2014/016/Frontier Saldanha” to the SRMO Project.

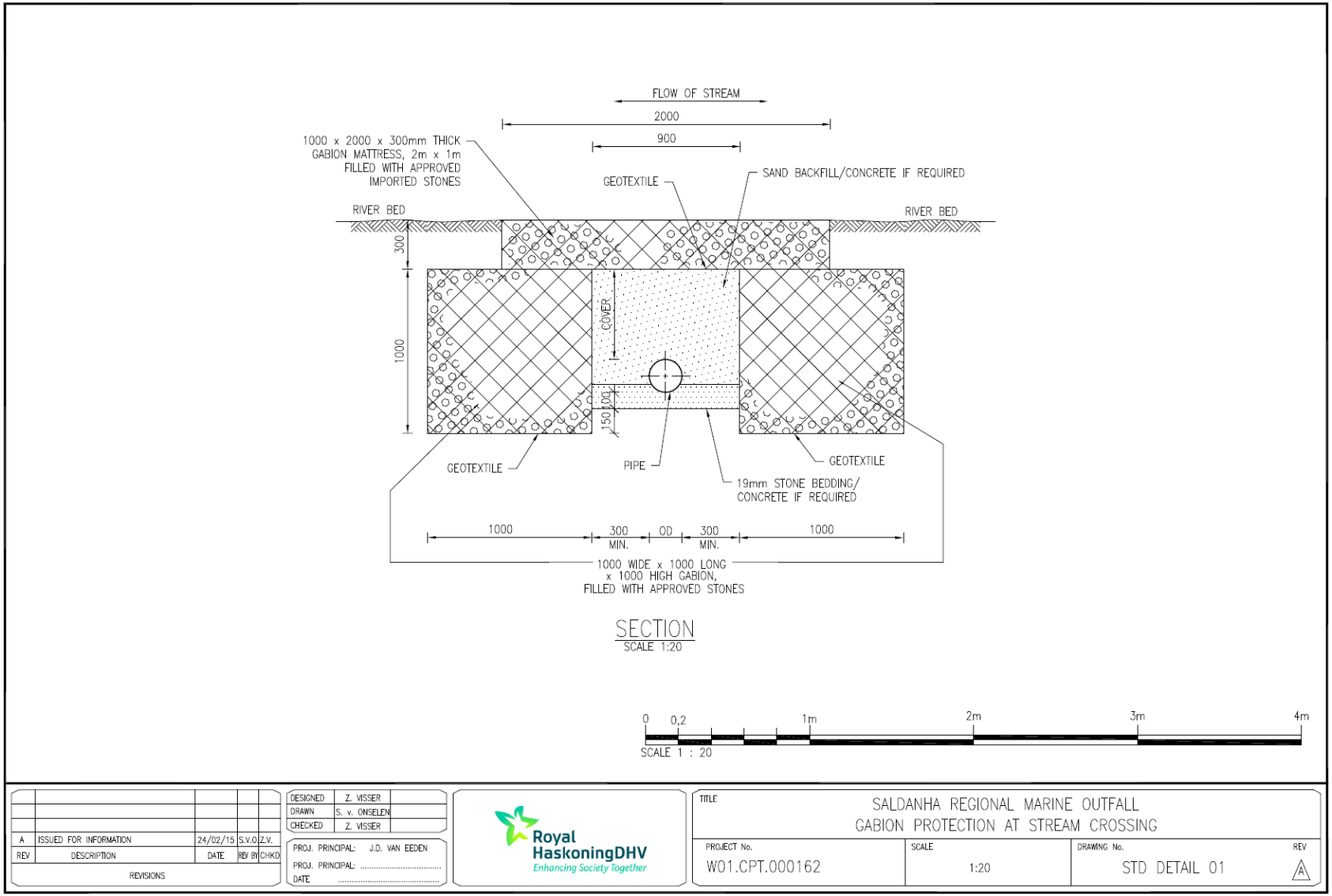

Figure 5-2: Pipeline design drawing indicating gabion protection at stream crossings

5.5 Affected Water Resources

There are 2 areas where watercourses or wetlands may be traversed by the pipeline and electrical corridor (Wetland 1 and Wetland 2). Wetland 1 comprises a relatively large, seasonally inundated depressional wetland. Excavation of a pipeline trench, stockpiling of excavated soil and compaction over the pipelines would have adverse implications for wetlands. These impacts would be considered highly undesirable in the case of the delineated Wetland 1 on the southern side of the Jacobsbaai Road. The impacts are likely to be permanent and of medium intensity, and although taking place within only a small portion of the wetland, would be considered as taking place at a regional scale, given the conservation importance of Wetland 1. Due to the impacts associated with the delineated Wetland 1 on the southern side of the Jacobsbaai Road, it is proposed that the pipeline and electrical corridor will be routed along the northern section of the Jacobsbaai Road through the disturbed portion of an ephemeral pan.

In the case of Wetland 2, comprising the Bok River valley bottom wetland, installation of the pipelines would be likely to trigger most of the above impacts, over a highly localised area, but nevertheless an area with implications for flow along the channel. As the proposed corridor development will occur within 500 m of these wetlands, an Integrated Water Use Licence Application (IWULA) will be submitted to the Department of Water and Sanitation (DWS) with the Final EIR (this approach was confirmed by Mr Warren Dreyer of DWS).

Groundwater regionally flows in a south-westerly direction across the site towards the coast. As groundwater regionally flows south-westwards, it flows away from both the Langebaan Road and Elandsfontein Aquifer Systems, as well as away from existing groundwater users in the area east of the Salkor Yard. According to the 1:250 000 Hydrogeological map of Cape Town the Electrical Conductivity of groundwater found in the region are between 150 – 300 mS/m.

According to the DWAF (1998), Quality Guidelines for Domestic Water Supplies, this range is classified as unacceptable for drinking purposes and represents saline conditions. The quality of the natural groundwater is a direct result of the closeness of these aquifers to the ocean. Ambient groundwater tends towards a Na-Cl character, which is common for groundwater along the coast (Aurecon, 2013).

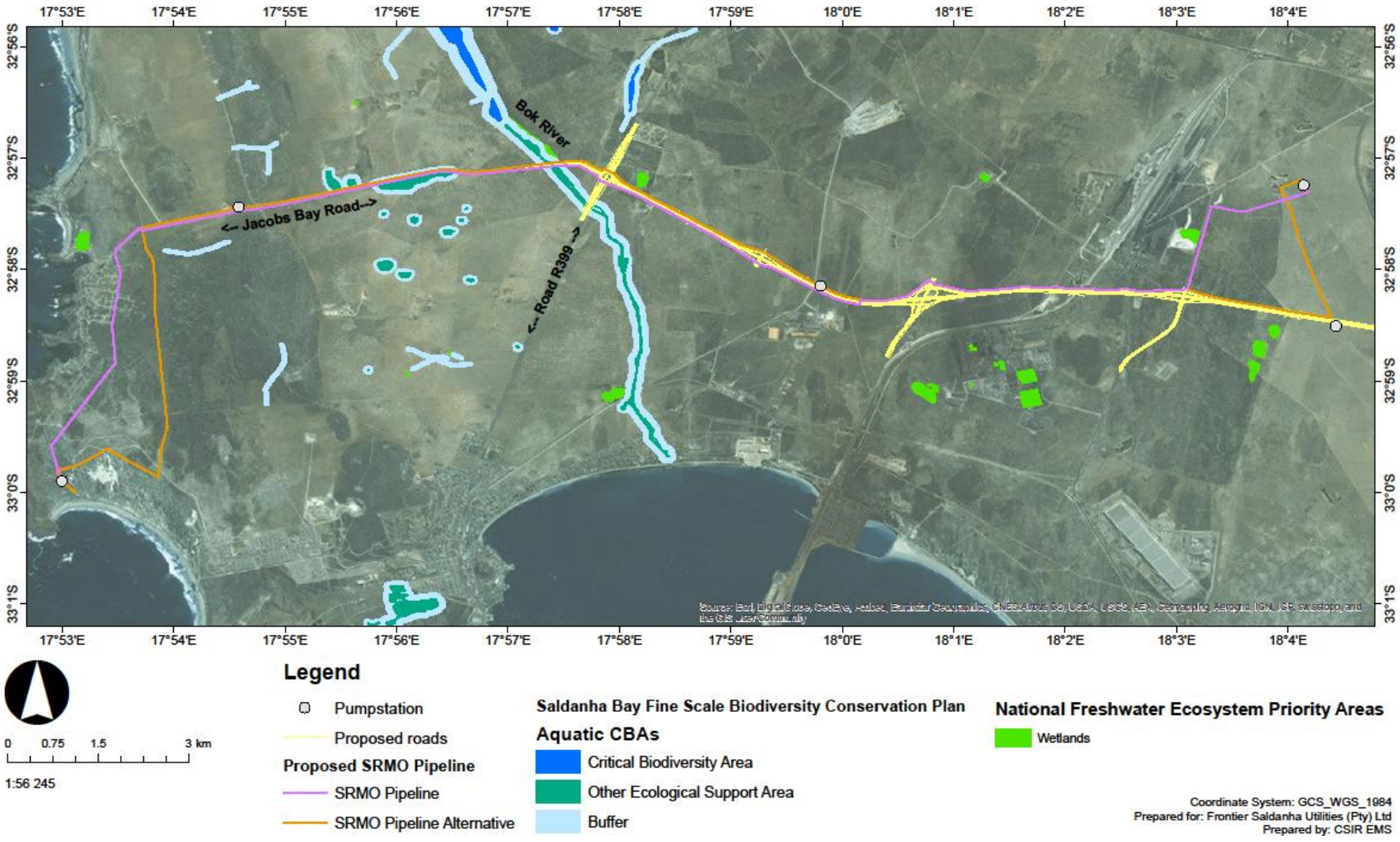

Figure 5-3: Aquatic ecosystems potentially affected by the proposed SRMO infrastructure

5.6 Required licence period

The proposed pipeline will be designed with a potential lifespan of approximately 30 years; however, it is envisaged that the WCDM desalination plant will be commissioned well within this period and that the marine component of the SRMO will be decommissioned and rehabilitated (i.e. there will be a shared outfall facility utilised by the WCDM desalination plant and the effluent emanating from the SRMO).

6 ENVIRONMENTAL BASELINE DESCRIPTION AND IMPACT ASSESSMENT

A brief description will be given of the surrounding environment. More detailed descriptions can be found in the EIA report attached to this report.

6.1 Biophysical environment

To follow is a brief description of the surrounding biophysical environment.

6.1.1 Topography

As reported by the visual specialist, Mr Henry Holland, the landscape along the pipeline and electrical corridor is flat to openly undulating coastal plains. Steep granite hills protrude from this landscape throughout the region and provide potential scenic viewpoints. The landscape character has a complex mixture of industrial, urban, agricultural and holiday resort elements. Having said that, areas around Danger Bay — although not pristine — are mostly free of industrial type developments and very few buildings exist there (in the absence of the proposed WCDM desalination plant).

The surface sedimentary geology of the low-lying areas consists mainly of calcretised and unconsolidated coastal and marine deposits; these are underlain by granite bedrock. Along the pipeline and electrical corridor, the soil is of low - medium agricultural potential according to the national Agricultural Geographic Information Systems database and the soils are greyish and sandy soils with minimal development potential, usually shallow, on hard or weathering rock, with or without intermittent diverse soils. Soils have good water holding potential but may be prone to erosion without appropriate mitigation. Lime will be present along most of the proposed pipeline corridor (CSIR, 2014).

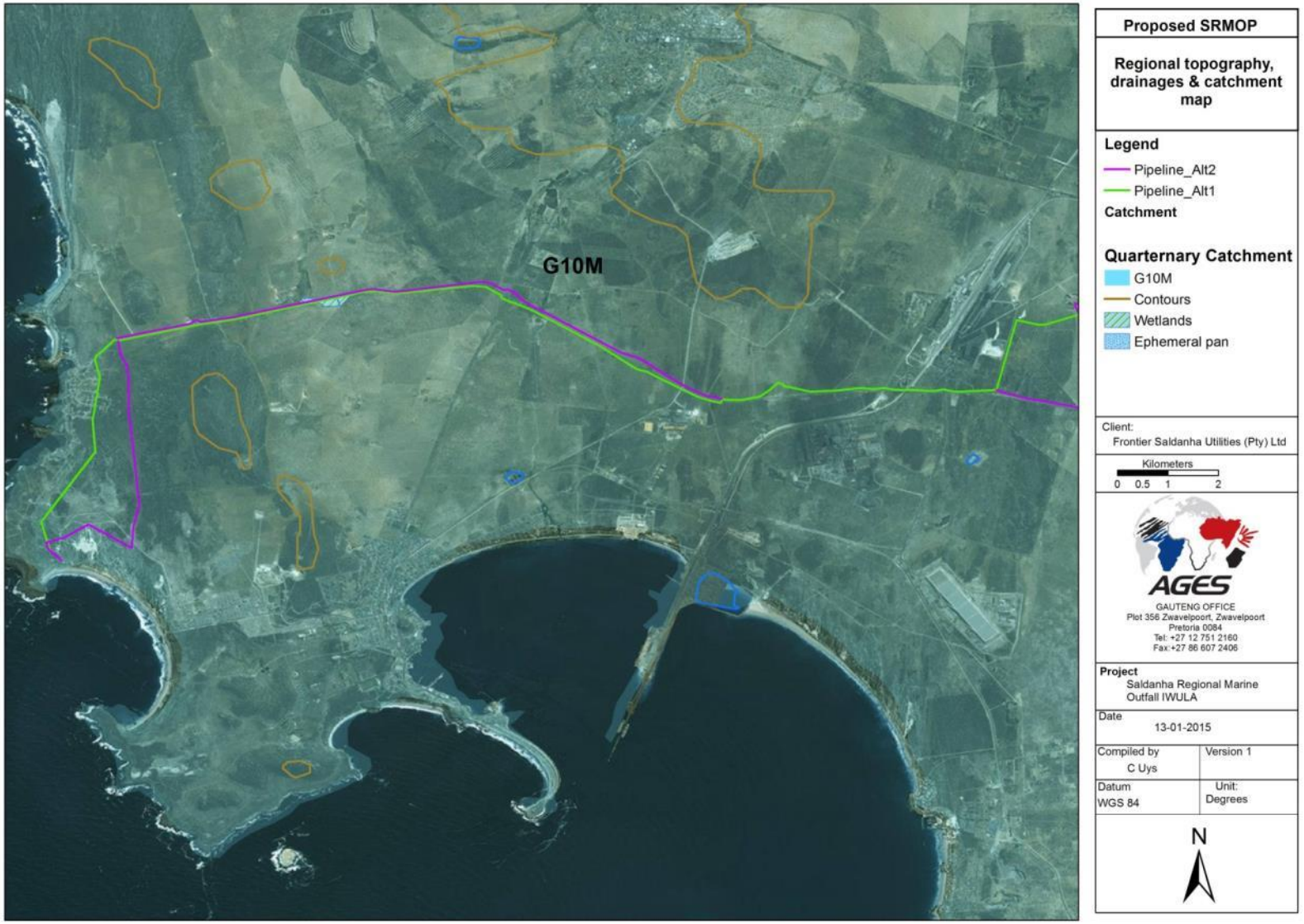

Figure 6-1: Regional topography, drainages and surface catchments

6.1.2 Flora

The study area is part of the greater West coast region, and lies within what may be termed the Saldanha Peninsula bioregion. This bioregion has a fairly distinct flora, and a particularly high number of locally and regionally endemic plant species, as well as plant Species of Conservation Concern (SCC) (Helme & Koopman 2007).

The study area lies within the Fynbos biome and the Core Cape Floristic Region (CFR). The latest data from the Red Data Book listing process undertaken for South Africa is that 67% of the rare or threatened plant species in the country occur only in the south-western Cape, and these total over 1 800 species (Raimondo et al. – 2009). It should thus be clear that the south-western Cape is a major national and global conservation priority, and is quite unlike anywhere else in the country in terms of the number of threatened plant species.

The study area is within the planning domain of the Saldanha Fine Scale Conservation Plan (Pence 2008), which has identified and mapped Critical Biodiversity Areas (CBAs) throughout the region. Critical Biodiversity Areas are regarded as essential areas for the achievement of regional conservation targets, and are designed to ensure minimum land take for maximum result (Maree & Vromans 2010). The Fine Scale Plan indicates that both pipeline route alternatives cross significant CBAs. As many as 25 different plant SCC are potentially found within 200 m of both proposed routes, usually where these cross CBAs.

The known or likely SCC within or close to the study area include Daubenya zeyheri (Vulnerable), Cephalophyllum rostellum (Endangered), Limonium acuminatum (Vulnerable), Limonium capense (Near Threatened), Passerina ericoides (Vulnerable), Lampranthus vernalis (Near Threatened), Ruschia langebaanensis (Threatened), Ruschia cupulata (Vulnerable), Drosanthemum marinum (Near Threatened), Agathosma thymifolia (Vulnerable), Otholobium bolusii (Vulnerable), Passerina filiformis ssp. glutinosa (Near Threatened), Arctopus dregei (Near Threatened), Aloe distans (endemic, should be regarded as a subspecies of A. perfoliata), Felicia elongata (Vulnerable), Romulea elliptica (Endangered), Romulea barkerae (Endangered), Moraea calcicola (Endangered), Cheiridopsis rostrata (Vulnerable), Anessorhiza calcicola (Vulnerable), Osteospermum calcicola (Vulnerable), Bulbinella calcicola (Critically Endangered), Sparaxis calcicola (not yet assessed), Moraea hainebachiana (Vulnerable), Zaluzianskya parviflora (Near Threatened) and Wiborgiella dahlgrenii (Endangered).

6.1.3 Fauna

Likely impacts on the terrestrial fauna are to a large extent expected to mirror the botanical impacts, mainly because the faunal species of concern are largely dependent on areas of remaining natural habitat. Two faunal SCC have been recorded from the study area (Breviceps rosei – SW coastal endemic, and Cordylus niger – Near Threatened), and a further six reptile SCC may occur (probably in low numbers) within the study area.

Highly mobile vertebrates like birds and most surface dwelling (non fossorial) mammals are not likely to be significantly or permanently impacted by pipeline construction, and are thus not further discussed. However, tortoises, frogs and snakes are a particular concern when trenches are dug, as they are liable to fall in and become trapped. There is a high density of tortoises in the area (pers. obs.), and the only species in the area is the widespread Angulate Tortoise (Chersina angulata).

Burrowing mammals like golden moles could theoretically be impacted by construction, and two species of concern could occur in the general study area - Grant's Golden Mole Eremitalpa granti (Vulnerable; EWT 2004) and Cape Golden Mole Chrysochloris asiatica (Data Deficient; EWT 2004). Their presence or abundance in the area is entirely unknown.

Most of the potential faunal SCC in the area are reptiles, with one frog. There are confirmed records of Rose's Rainfrog (Breviceps rosei) from the study area, and of the Black Girdled Lizard (Cordylus niger), but all the other six threatened reptiles are only potential occurrences, and probably occur at low densities.

The following faunal Species of Conservation Concern could potentially occur on site: Cape Sand Snake Psammophis leightoni (Vulnerable; Bates et al. 2014); Kasner's Dwarf Burrowing Skink Scelotes kasneri (west-coast endemic; Near Threatened; Bates et al. 2014); Gronovi's Dwarf Burrowing Skink Scelotes gronovii (west-coast endemic; Near Threatened; Bates et al. 2014); Blouberg Dwarf Burrowing Skink Scelotes montispectus (west-coast endemic; Near Threatened; Bates et al. 2014); and Southern Adder Bitis armata (Vulnerable; Bates et al. 2014).

No threatened butterfly species are known from any of the vegetation types occurring in the study area.

Mortality impacts on powerline infrastructure will particularly affect large terrestrial birds (e.g. Blue Crane, Ludwig's Bustard), commuting wetland birds (e.g. flamingo spp., waterfowl, shorebirds), and birds of prey (e.g. Martial Eagle Polemaetus bellicosus, Verreaux's Eagle Aquila verreauxii, Jackal Buzzard Buteo rufofuscus, Black Harrier, African Marsh Harrier Circus ranivorus, Peregrine Falcon Falco peregrinus, Lanner Falcon Falco biarmicus and Cape Eagle-Owl Bubo capensis), and will involve collision of flying birds with the overhead lines, and electrocution of birds perching on power poles and substations (CSIR, 2014).

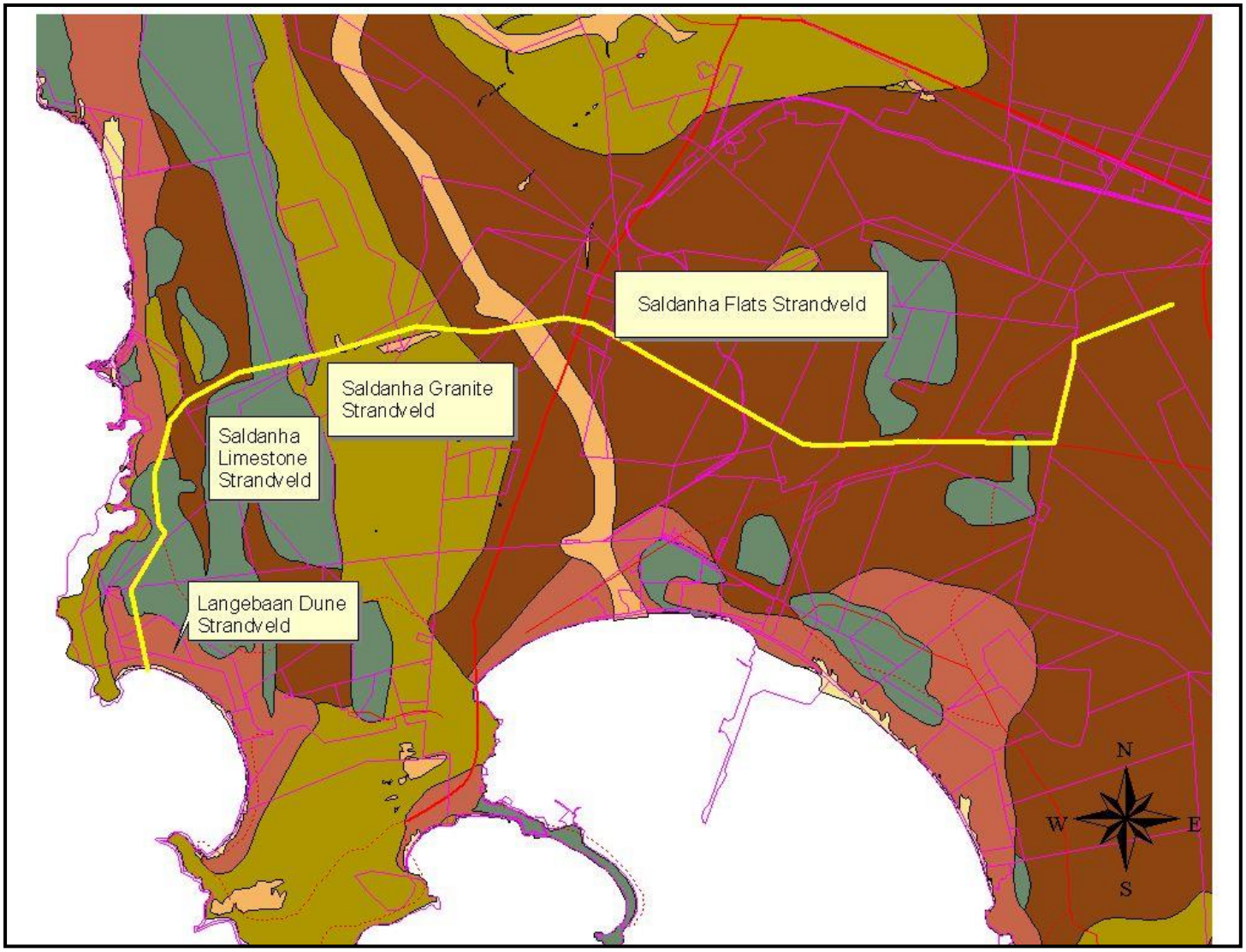

Figure 6-2: Extract of the Cape Nature Fine Scale Vegetation Map (Helme & Koopman 2007) for the area, showing the four main vegetation types crossed by the route (yellow line)

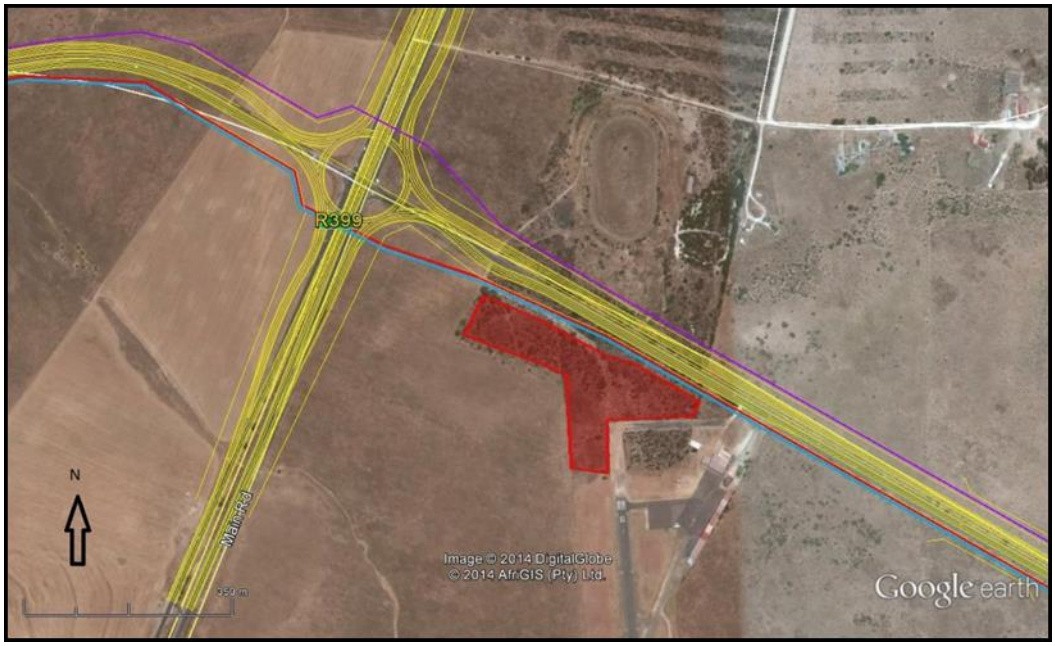

Figure 6-3: Map showing the Very High Sensitivity botanical area (red shading and outline) between the proposed pipeline and the airfield, just east of the Vredenburg – Saldanha road

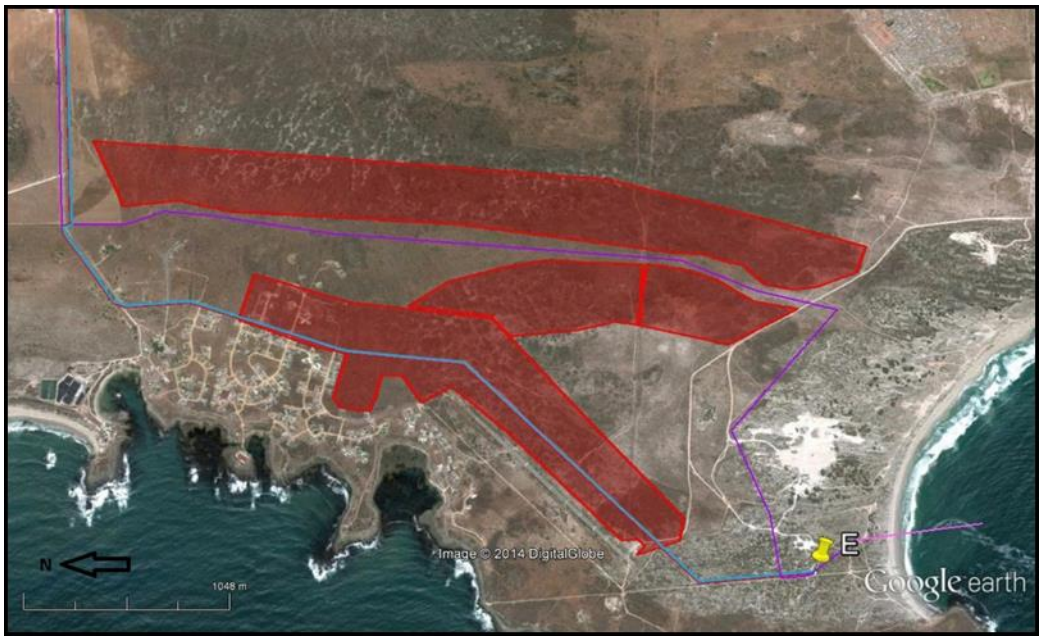

Figure 6-4: Map showing the Very High Sensitivity botanical areas (red shading and outline) within 200 m of the routes through the Jacobsbaai area. Unshaded areas within 200 m of the routes are of Low or Medium botanical sensitivity

Figure 6-5: The blue shaded area is a sensitive wetland and botanical area just south of the Jacobsbaai road. This area would be negatively impacted by the blue route alternative

6.1.4 Surrounding land uses

The eastern portion of the pipeline will be roughly adjacent to the existing ArcelorMittal Smelter in the Saldanha industrial zone (approximately 1 km north-east). The eastern portion of the pipeline is therefore in the immediate area of heavy industrial land uses which are integrated with significant infrastructure — primarily in the form of the nearby iron ore terminal, road networks and high capacity power provision installations.

The western portion of the Jacobsbaai Eastern Corridor pipeline will run parallel to the Jacobsbaai Road through degraded farmlands. When the corridor turns to the south before the town of Jacobsbaai, the route will traverse areas characterised by coastal vegetation disturbed in places by activities such as sand mining and previous farming developments. The Jacobsbaai Western Corridor will be located within the road reserve and will transverse a sensitive limestone area. A gravel road links Jacobsbaai and Diazville and there are a number of 4X4 tracks in the area leading to the coast used primarily by fishermen and other recreational users. The character of the area is primarily that of a rugged and largely undeveloped coastline — but with human settlements and activities relatively nearby.

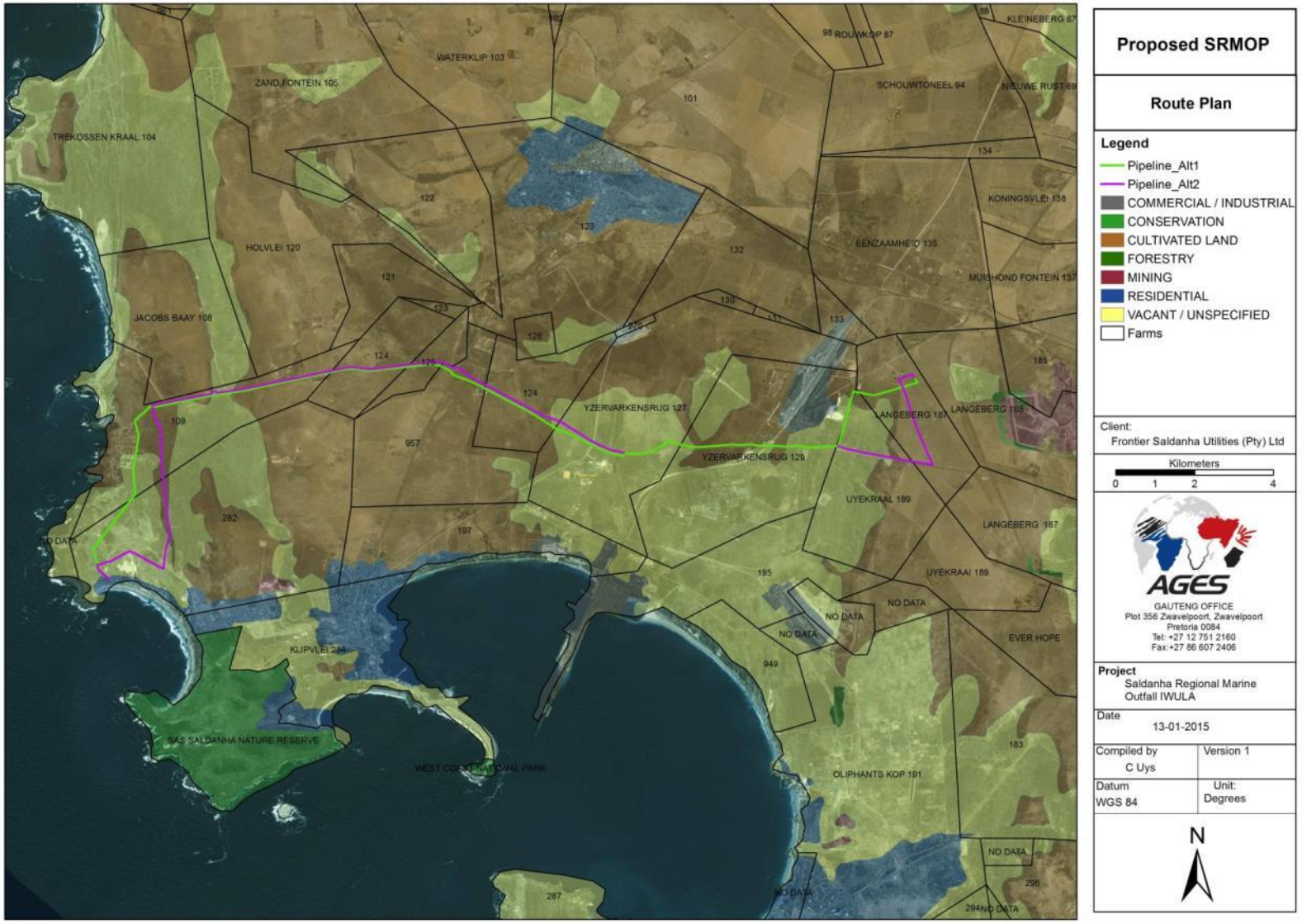

Figure 6-6: Route Plan indicating land use of properties

6.1.5 Climate

The climate of the Saldanha Bay area is mild to cool and is strongly influenced by the cold Benguela Current that moves up the west coast of southern Africa. Temperatures in the area are mostly less than 20°C and rarely exceed 30°C. The area has a semi-arid Mediterranean climate with an average annual rainfall of approximately 300-330 mm. Most of the rainfall occurs in winter, with summers generally being dry.

Coastal fogs caused by the interaction between cold marine air (the result of the Benguela Current) and the warmer land mass are common, particularly in autumn. There is a strong seasonality in the winds over Saldanha Bay, reflecting the changes in the synoptic weather patterns prevailing at different times during the year. Southerly winds pre-dominate in this region for most of the year, modulated by short periods of calm conditions or north-westerly winds which are associated with the propagation of coastal lows southwards along the west coast of southern Africa and weather fronts passing south of the sub-continent. Only in the mid-winter months do north to north-westerly winds predominate (CSIR, 2014).

6.1.6 Ecoregion context

An ecoregional classification produced by Kleynhans et al. (2005) divided the country's rivers into 31 distinct ecoregions, or groups of rivers which share similar physiography, climate, geology, soils and potential natural vegetation. The present site lies in the South Western Coastal Belt Ecoregion. This ecoregion is characterised by the following broad attributes:

- Comprises mainly plains with a moderate to low relief;
- Dominant vegetation type is West Coast Renosterveld although significant areas of Fynbos, Succulent Karoo and Thicket occur;
- Mean annual precipitation is Moderate in a limited area in the south, decreasing to low in the north;
- Drainage density is low;
- Stream frequency is low/medium; and
- Mean annual temperatures are moderate/high.

6.1.7 Catchment context

The proposed SRMO pipeline routing options lie within DWS quaternary catchment G10M, in the Berg River Water Management Area. One of the wetlands assessed in this study (Wetland 1; Figure 1-3) lies within minor catchments, which either dissipates or drains directly into the sea to the west. The other assessed area (Wetland 2) is situated in the catchment of the Bok River (Figure 1-4), which flows south into Saldanha Bay.

6.1.8 Wetlands

Data from the National Freshwater Ecosystem Priority Area (NFEPA) and the wetland impact assessment study undertaken by Dr Liz Day as part of the WCDM desalination EIA indicated that there are 2 areas where watercourses or wetlands may be traversed by the pipeline and electrical corridor (Wetland 1 and Wetland 2); these are shown in Figure 1-3 and Figure 1-4 below.

Wetland 1 is classified as a Strandveld Depression (Job et al. 2008). Strandveld depression wetlands such as this occur primarily on the Saldanha Peninsula and just north of the lower Berg River, and are described as being primarily reliant on precipitation rather than groundwater or surface flow, and usually brackish to saline. In the present case, the wetland appears to function as a perched system, and did not connect to any channelled outflow. During periods of particularly high surface runoff, it is likely that the wetland expands its extent of inundation into the surrounding farmland, rarely overtopping to the extent that it drains into

the adjacent watersheds.

Wetland 2 is classified as a Strandveld Valley Bottom Wetland, which are located almost exclusively on the Saldanha Peninsula, and comprising seasonal wetlands, associated with lower foothill and lowland rivers. They are generally fed by hillslope seeps lying on higher ground and are not particularly groundwater-dependent. Most of the valley bottoms have a well-defined channel, but it is likely that historically they lacked a channel and water flowed as diffuse flow through marshy areas. Strandveld valley bottoms tend to be saline, and occur on neutral to alkaline sands or granite-derived soils.

Groundwater regionally flows in a south-westerly direction across the site towards the coast. As groundwater regionally flows south-westwards, it flows away from both the Langebaan Road and Elandsfontein Aquifer Systems, as well as away from existing groundwater users in the area east of the Salkor Yard. According to the 1:250 000 Hydrogeological map of Cape Town the Electrical Conductivity of groundwater found in the region are between 150 – 300 mS/m.

According to the DWAF (1998), Quality Guidelines for Domestic Water Supplies, this range is classified as unacceptable for drinking purposes and represents saline conditions. The quality of the natural groundwater is a direct result of the closeness of these aquifers to the ocean. Ambient groundwater tends towards a NaCl character, which is common for groundwater along the coast (Aurecon, 2013).

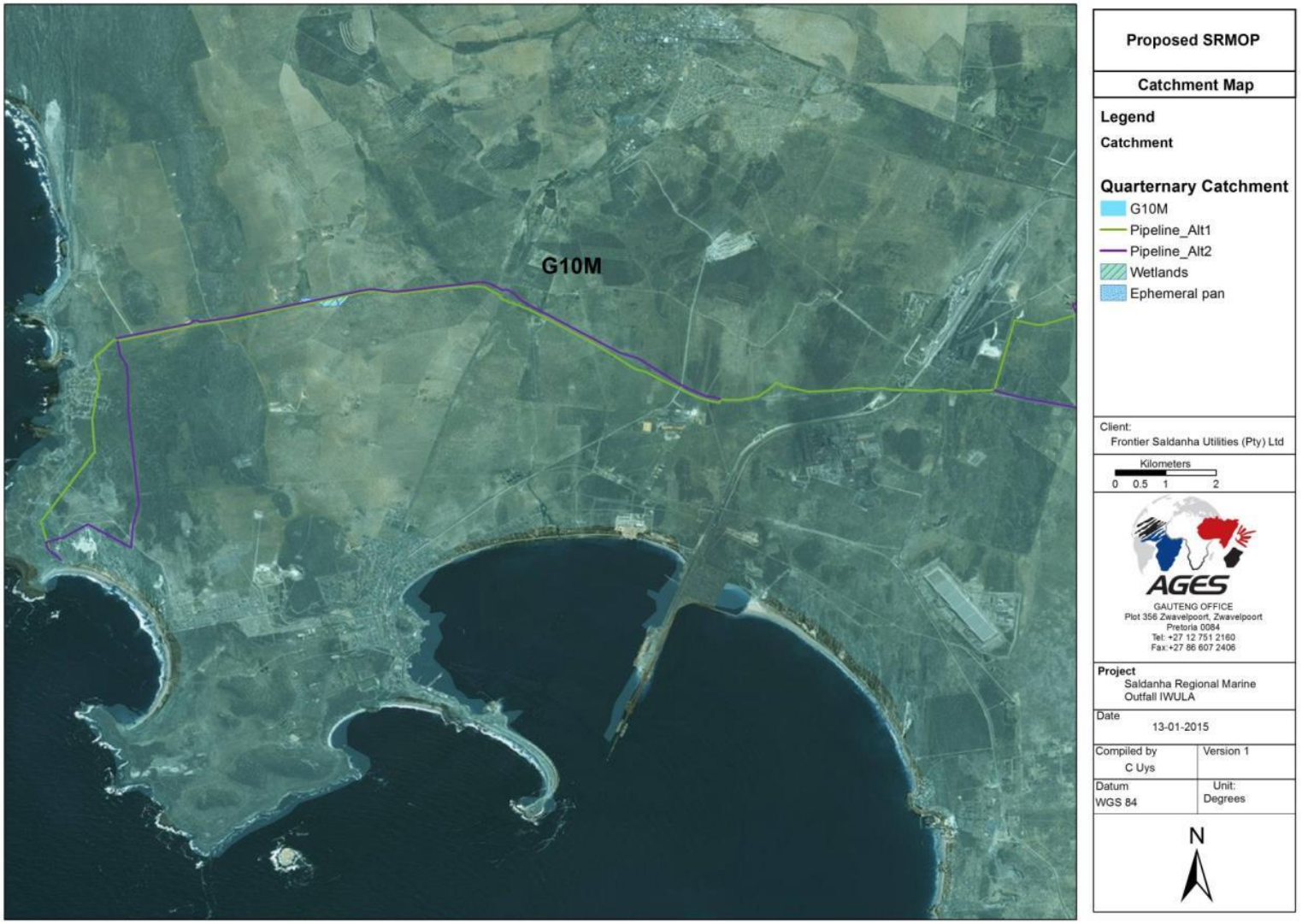

Figure 6-7: Catchment area

6.2 Social and Socio Economic Baseline Conditions

This section examines key socio-economic characteristics of the study area, which is essential as it provides both qualitative and quantitative data related to the economies under observation, creating a baseline against which the impacts can be assessed. The information is presented in terms of a National / Provincial, Regional and Local Scale.

6.2.1 National / Provincial Social and Economic Conditions

The Western Cape is South Africa's fourth largest province (www.southafrica.info), only slightly smaller than the Free State Province. It covers a total area of 129 462 square kilometres. The province is made up of one metropolitan municipality (City of Cape Town) and five district municipalities, namely West Coast, Eden, Cape Winelands, Overberg and Central Karoo.

A variety of diverse cultural backgrounds gives the province a cosmopolitan flavour, creating a demographic profile quite different from the national pattern. The Western Cape is topographically and climatically varied. The Western Cape's natural beauty, famous hospitality, cultural diversity, excellent wine and rich cuisine make it one of the world's greatest tourist attractions. It is also home to two Unesco World Heritage Sites, namely the Cape Floral Kingdom and Robben Island.

The Western Cape economy contributes roughly 14,5% to South Africa's GDP (www.southafrica.info). The province has the lowest unemployment rate in the country (www.westerncape.gov.za). Many of South Africa's major insurance companies and banks are based in the Western Cape, as well as most of the country's petroleum companies and the largest segment of the printing and publishing industry. The clothing and textile industry remains the most significant industrial source of employment in the province. As a spin-off of the massive Saldanha Steel project, the Saldanha-Vredenburg area is emerging as a new industrial area (www.southafrica.to).

Export-grade fruit such as apples, table grapes, olives and peaches are cultivated in the province. A variety of vegetables is cultivated in the eastern part of the Western Cape, while wheat is grown in the Swartland and Overberg districts. The inland Karoo region and the Overberg district around Bredasdorp produce wool and mutton, as well as pedigree Merino breeding stock (ww.southafrica.info). Other animal products include broiler chickens, eggs, dairy products, beef and pork. The province also exports horses, ostrich meat, leatherware and ostrich feathers. The rich fishing grounds at the west coast produce snoek, Cape lobster, abalone, calamari, octopus, oysters and mussels (Aucamp, 2014).

6.2.2 Regional Social and Economic Conditions

The West Coast District Municipality is bordered by the City of Cape Town Metropolitan Municipality, the Cape Winelands District Municipality, the Northern Cape Province and the Atlantic Ocean and covers an area of 31 099 km2 (www.westcoastdm.co.za). Five local municipalities fall under the West Coast District, namely Matzikama, Cederberg, Bergrivier, Saldanha Bay and Swartland. Main towns in the area include Malmesbury, Moorreesburg, Piketberg, Vredenburg, Clanwilliam and Vredendal.

The key growth sectors in the district include agriculture, fishing, manufacturing, tourism and mining (West Coast District Municipality IDP 2012 – 2016). Agriculture consists primarily of wheat, canola, rooibos tea, fruit, grapes, wine, export-ready

vegetables, poultry, fresh milk, dairy products, beef, mutton, lamb and pork products. The highest growth potential in the region lies in fishing with value-added processing and expansion into mariculture and aquaculture activities. Other fishing activities include deep-sea fishing, line fishing and lobsters.

Manufacturing is the second most prominent economic sector and includes agro-processing, fish or marine resource processing and mineral processing. Potential for growth exists in the food processing, non-metallic mineral products, iron, basic steel and non-ferrous metal industries. The landscape is well suited for wind farms and solar powered infrastructure investment to meet regional and national electricity needs. The deep-water port and the infrastructure, as well as location of the port at Saldanha Bay, make it a crucial role player in the oil and gas industry and presents a growth opportunity for the region. South Africa's major ore terminal is at the Port of Saldanha with mining activities in the area including limestone, diamonds and phosphate (Aucamp, 2014).

6.2.3 Local Social and Economic Conditions

The Saldanha Bay Local Municipality is located on the West Coast of South Africa, approximately 140 km north of Cape Town and it forms part of the West Coast District Municipality. The municipality is bordered by the Atlantic Ocean in the west, the Bergrivier Local Municipality in the north and the Swartland Municipality in the east. The Saldanha Bay LM covers an area of 2 015 km2 and has a coastline of 238 km (www.saldanhabay.co.za). Saldanha Bay has the largest natural port in Africa and the area is earmarked as a regional point for the development of the Western Cape Province (Saldanha Bay Municipality IDP 2012 - 2017). The municipality includes a number of large rural areas, as well as the following towns: St Helena Bay, Jacobsbaai, Paternoster, Cape Columbine Nature Reserve (Tietiesbaai), Saldanha, Hopefield, Vredenburg and Langebaan.

The main contributors to Saldanha Bay LM's GDP are manufacturing (30%), transport (16%), services (15%), trade (13%), finance (12%), agriculture (7%) and construction (5%). The industrial, tourism and agricultural sectors are seen as the main drivers of the economy of the Saldanha Bay LM (Saldanha Bay Municipality IDP 2012 - 2017). The area is known for mussels, lobster, abalone and other seafood. St Helena Bay is one of the world's principal fishing centres and there are twelve fish-processing factories in the surrounding area, as well as a fishery in the Paternoster area. The town of Saldanha is home to a large variety of fishing vessels and hosts many industries, for example crayfish, fish, mussels, oysters, seaweed and many more. The town is also important for export and has a huge iron ore quay. The Saldanha Bay harbour as well as Saldanha Steel, a state of the art steel mill, plays an important role in the Sishen-Saldanha iron ore project. There is a concentration of heavy steel and mineral industries and supporting services within the municipal area. Mining activities such as mining of lime scales and sand are taking place in the area; many of the mining operations are currently located in relative close proximity to the Saldanha and Langebaan areas. Agricultural activities in the area include grain, dairy, meat, honey and waterblommetjies, with Hopefield serving as the agricultural hub in the area. Saldanha is also the location of the South African Military Academy as well as SAS SALDANHA, a naval training unit. From a tourism perspective, the area is known for its scenery and offers activities and attractions such as whale and dolphin watching, marine bird life, penguins, large colonies of seals, hiking trails, fishing trips, wildflowers in Spring and a variety of water sport activities like sailing, windsurfing, surfing, fishing, diving and paddling. There are also a number of annual events like Paternoster Jazz on the rocks, Offshore Regatta, West Coast Marathon, Fynbos

Blommeskou and a few others taking place.

The Saldanha Bay LM has experienced a number of development initiatives over the past three decades that influenced industrial development and contributed to the broadening of the economic base of the municipal area. The municipality is of the opinion that these opportunities should be exploited by the Saldanha Port and that there is a definite need to spatially identify and quantify future industrial land needs related to future port expansion, downstream processing and predicated light industrial growth and the ultimate realisation of an Industrial Development Zone (IDZ). The application for the Saldanha Bay IDZ was gazetted for public comment in November 2012. President Jacob Zuma officially launched the IDZ on 31 October 2013 (Aucamp, 2014).

6.2.4 Conclusion / Summary with respect to the baseline social and socio-economic conditions

The proposed Jacobsbaai Eastern Corridor pipeline development will be situated partly in the Saldanha industrial zone for the eastern portion, while the western portion will run through degraded farmlands and coastal vegetation disturbed in places by activities such as sand mining and previous farming developments. The Jacobsbaai Western Corridor will be located within the road reserve and will transverse a sensitive limestone area.

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 Saldanha Bay area has long been recognised as an area of significant 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). The growth potential of the Saldanha Bay municipal area with its proximity to Cape Town land natural deep water harbour have also resulted in it being recognised as a Presidential Development Growth Node.

It is an area that has experienced a steady influx of people and rapid industrial development in the last two decades. As such, a number of social challenges are already present in the community, and Frontier may contribute to some of the challenges. It is unrealistic to expect Frontier to mitigate existing impacts, but it can play an important role in contributing to solutions. With all the development in the area the SBLM should approach the situation strategically and act as a conduit for joined efforts by industry to mitigate impacts. It is therefore important for Frontier to have a good relationship with the SBLM and engage with them from an early phase to align efforts.

The proposed SRMO Project would be a pre-requisite for the development of the SP as the latter would only be technically feasible if process effluent can be legally disposed of. The benefits associated with the SP 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 which 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 (CSIR, 2014).

Please refer to the Section 27 Motivation contained in Section 10 of this report for a description of the socio-economic benefits associated with this project.

6.2.5 Proposed servitudes

It is proposed that a combined servitude be registered by the WCDM and Frontier Utilities, together with other participating industries, after completion. This servitude will be wide enough to accommodate the existing infrastructure and the proposed SRMO pipeline. The required width of the servitude was estimated to be approximately 10 m, however will be confirmed after the positioning of the SRMO pipeline has been finalised.

The pipeline servitude will not require rezoning, however, the pump stations sites may require rezoning. The preferred option would be to position the pump stations along the pipe route within the 20 m servitude area (CSIR, 2014).

6.2.6 Wayleave application

After the finalisation of the SRMO pipeline corridor, application for wayleave will be submitted to the relevant authorities who include inter alia:

- Eskom;
- West Coast District Municipality;
- Tronox Namakwa Sands;
- Transnet;
- Saldanha Bay Municipality; and
- Provincial Roads Department.

6.2.7 The applicant's right to the properties

The proposed pipeline occurs along various properties belonging to private landowners; refer to the Table 6-1 below:

Table 6-1: Properties and landowners adjacent to the proposed pipeline

Farm	SG Code	Landowner
RE of Jacobs Bay 108	C04600000000010800000	J M Pienaar Trust
Portion 7 of Jacobs Bay 108	C04600000000010800007	Jacobsbaai Tortoise Reserve Pty Ltd
RE of Jacobs Bay 109	C04600000000010900000	Fastpulse Trading 63 Pty Ltd
Portion 1 of Jacobs Bay 109	C04600000000010900001	Pienaar Nicolaas Everhardus
		Pretorius Hendrik Johannes
Portion 7 of Jacobs Bay 109	C04600000000010900007	National Portland Cement Co Ltd
Portion 16 of Jacobs Bay	C04600000000010900016	Pretorius Hendrik Johannes

109		
RE of Farm 119	C04600000000011900000	Republiek van Suid-Afrika (Openbare Werke/Grondsake)
Re of Farm 124	C04600000000012400000	Centrepoint Farmsteads Pty Ltd
Portion 1 of Farm 124	C04600000000012400001	Siltha Inv Holdings Pty Ltd
RE pf Phillips Kraal 125	C04600000000012500000	Pienaar Nicolaas Everhardus
		Centrepoint Farmsteads Pty Ltd
Portion 2 of Yzervarkensrug 127	C04600000000012700002	Siltha Inv Holdings Pty Ltd
Portion 6 of Yzervarkensrug 127	C04600000000012700006	Transnet Freight Rail (Depot Engineer)
Portion 15 of Yzervarkensrug 127	C04600000000012700015	Tronox (Namakwa Sands)
Portion 36 of Yzervarkensrug 127	C04600000000012700036	West Coast Development Trust
Portion 1 of Yzervarkensrug 129	C04600000000012900001	Republiek Van Suid-Afrika
Portion 3 of Kliprug 282	C04600000000028200003	Saldanha Bay Municipality
Portion 5 of Kliprug 282	C04600000000028200005	Republiek Van Suid-Afrika (Openbare Werke/Grondsake)
Portion 13 of Kliprug 282	C04600000000028200013	Consolidated Limeworks Pty Ltd
Portion 18 of Kliprug 282	C04600000000028200018	Wwf South Africa
RE of Farm 957	C04600000000095700000	Bill Pienaar Trust
Portion 8 of Farm 957	C04600000000095700008	Du Toit & Farrells Raceway CC
RE of Farm 1112	C04600000000111200000	Tronox (Namakwa Sands)
RE of Farm 1135	C04600000000113500000	Loubser Nicolaas Hendrik
RE of Farm 1135	C04600000000113500001	Transsand Cc
299	C04600180000029900000	Forellendam Pty Ltd
306	C04600180000030600000	Benno Alph Piehl
307	C04600180000030700000	E C Swanepoel Familietrust
889	C04600180000088900000	No Data - Subdiv Jacobsbaai
890	C04600180000089000000	Jacobsbaai Developers Pty Ltd
892	C04600180000089200000	Matflor Pty Ltd

Figure 6-8: Surrounding Communities

7 IMPACT ASSESSMENT

7.1 Impact Assessment Methodology

The identification of potential impacts should include impacts that may occur during the construction and operational phases of the activity. The assessment of impacts is to include direct, indirect as well as cumulative impacts.

In order to identify potential impacts (both positive and negative) it is important that the nature of the proposed activity is well understood so that the impacts associated with the activity can be assessed. The process of identification and assessment of impacts will include:

- Determine the current environmental conditions in sufficient detail to provide a baseline against which impacts can be identified and measured;
- Determine future changes to the environment that may occur if the activity does not proceed;
- An understanding of the activity in sufficient detail to understand its consequences; and
- The identification of significant impacts which are likely to occur if the activity is undertaken.

As per DEAT Guideline 5: Assessment of Alternatives and Impacts the following methodology is to be applied to the predication and assessment of impacts. Potential impacts should be rated in terms of the direct, indirect and cumulative:

- Direct impacts are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.
- Indirect impacts of an activity are indirect or induced changes that may occur as a result of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.
- Cumulative impacts are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.
- Spatial extent – The size of the area that will be affected by the impact:
    - Site specific
    - Local (less than 2 km from site)
    - Regional (within 30 km of site)
    - National
    - International (important for migrant birds)
- Intensity – The anticipated severity of the impact:
    - High (severe alteration of natural systems, patterns or processes)
    - Medium (notable alteration of natural systems, patterns or processes)

  - Low (negligible alteration of natural systems, patterns or processes).
  - Duration – The timeframe during which the impact will be experienced:
  - Temporary (less than 1 year)
  - Short term (1 to 6 years)
  - Medium term (6 to 15 years)
  - Long term (the impact will cease after the operational life of the activity)
  - Permanent (mitigation will not occur in such a way or in such a time span that the impact can be considered transient).

- Reversibility – The "reversibility" of the environmental impacts of the proposed development after project cessation or decommissioning ('High' representing a 'positive' value and 'Low' representing a 'negative' value):
  - High (the alteration of natural systems can be reversed to an extent that represents similar or better environmental conditions, pre-development - through rehabilitation)
  - Medium (alteration of natural systems can be reversed to some extent)
  - Low (it is unlikely that the alteration of natural systems can be reversed)
- Irreplaceability – The "replaceability" of the natural characteristics in the area that may be impacted upon the proposed development:
  - High (high irreplaceability means that the opportunity to replace or restore systems that are affected by the proposed development will be in very short supply and the site will not recover to its original state
  - Medium (alteration of natural systems, patterns or processes may be able to be replaced)
  - Low (the site does most likely not represent a particularly sensitive system and can be replicated or replaced).

Using the criteria above, the impacts will further be assessed in terms of the following:

- Probability –The probability of the impact occurring:
  - Improbable (little or no chance of occurring)
  - Probable (less than 50% chance of occurring)
  - Highly probable (50 – 90% chance of occurring)
  - Definite (greater than 90% chance of occurring).
- Significance – Will the impact cause a notable alteration of the environment?
  - **Low to very low** (the impact may result in minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making);
  - **Medium** (the impact will result in a moderate alteration of the

environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated); and

- **High** (the impacts will result in a major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making).

- Status - Whether the impact on the overall environment will be:
  - positive - environment overall will benefit from the impact
  - negative - environment overall will be adversely affected by the impact
  - neutral - environment overall not be affected.
- Confidence – The degree of confidence in predictions based on available information and specialist knowledge:
  - Low
  - Medium
  - High
- Management Actions and Monitoring of the Impacts (EMP)
  - Where negative impacts are identified, mitigation measures will be identified to avoid or reduce negative impacts. Where no mitigation measures are possible this will be stated;
  - Where positive impacts are identified, measures will be identified to potentially enhance positive impacts; and
  - Quantifiable standards for measuring and monitoring mitigation measures and enhancements will be set. This will include a programme for monitoring and reviewing the recommendations to ensure their ongoing effectiveness.

Table 7-1: Impact Rating

below is to be used by specialists for the rating of impacts.

Other aspects to be taken into consideration in the assessment of impact significance are:

- Impacts will be evaluated for the construction and operation phases of the development. The assessment of impacts for the decommissioning phase will be brief, as there is limited understanding at this stage of what this might entail. The relevant rehabilitation guidelines and legal requirements applicable at the time will need to be applied;
- The impact evaluation will, where possible, take into consideration the cumulative effects associated with this and other facilities/projects which are either developed or in the process of being developed in the local area;
- The ‘no-go alternative’ (‘no-development alternative’) must be considered;
- The Western and Eastern Jacobsbaai Road Corridors must be

assessed;

- The Marine Ecological study must also assess the co-disposal option with the West Coast District Municipality Desalination Plant.
- The impact assessment will attempt to quantify the magnitude of potential impacts (direct and cumulative effects) and outline the rationale used. Where appropriate, national standards are to be used as a measure of the level of impact.

7.2 Wetland impact

Ms Luanita van der Walt (CSIR) prepared the Wetlands Study for the SRMO EIA. This study was adapted from the Freshwater Ecological Study that was done by Dr Liz Day of Freshwater Consulting cc for the Saldanha Desalination plant of the WCDM (Day, 2013).

The proposed SRMO pipeline routing corridors lie within DWS quaternary catchment G10M, in the Berg River Water Management Area. Two aquatic ecosystems were identified along the Jacobsbaai road (within the 10 m servitude of the WCDM) which may potentially be affected by the proposed SRMO Project. These two wetlands were assessed in the Freshwater Ecology study and are referred to as Wetland 1 and Wetland 2. Wetland 1 lies within minor catchments, which either dissipates or drains directly into the sea to the west. Wetland 2 is situated in the catchment of the Bok River which flows south into Saldanha Bay. Both pipeline routing alternatives (Jacobsbaai Western and Eastern corridors) follow the same route along this section of the pipeline (CSIR, 2014).

7.2.1 Identification of impacts

The following potential impacts were identified:

- 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 (CSIR, 2014).

7.2.2 Assessment of impacts

The above impacts would be considered highly undesirable in the case of the delineated wetland 1 on the southern side of the Jacobs Bay Road. The impacts are likely to be permanent and of medium intensity, and although taking place within only a small portion of the wetland, would be considered as taking place at a regional scale, given the conservation importance of Wetland 1. The overall significance of the above impacts in this area would be considered negative and high before mitigation and negative and low after mitigation.

In the case of the wetlands north of wetland 1, on the northern side of the Jacobsbaai Road, although the impacts would still be negative, their scale and intensity would all be low, given the extent of degradation that has already occurred in this area. The overall significance of the above impacts in this area would be considered negative

and medium to low.

In the case of wetland 2, comprising the Bok River valley bottom wetland, installation of the pipelines would be likely to trigger most of the above impacts, over a highly localised area, but nevertheless an area with implications for flow along the channel. Creation of a raised mound over the pipeline to ensure sufficient cover would potentially result in pooling of flows upstream of the culvert. The intensity of these impacts is considered low, and they would occur at a very local scale. They would however affect a system earmarked for long-term improvement and would thus be considered negative and of medium significance without mitigation. After mitigation, the impacts are rated as negative and of low significance (CSIR, 2014).

7.2.3 Management actions and mitigation measures

The following mitigation measures are recommended:

- Avoidance of wetland 1 on the southern side of the road, by routing the pipelines along the northern side of the Jacobsbaai Road only;
- Compilation of, and strict adherence to, a construction phase EMPr which outlines measures to:
    - prevent the passage of sediment or other contaminated material into adjacent wetlands;
    - minimise the disturbance footprint; and
    - ensure that all wetlands south of the road are treated as no go areas – including the wetland margins in the southern road reserve.
- Managing the timing of construction through wetland areas such that it takes place outside of the wet season, and preferably during late summer / autumn, so that the period before plants re-establish in the wet season is limited; and
- Rehabilitation of disturbed areas so that pre-construction levels are achieved, and such that the pipeline does not result in the creation of a longitudinal raised mound – this measure could entail spreading of excess fill into disturbed terrestrial areas; fill should not be spread into any wetland areas (CSIR, 2014).

Table 7-1: Impact Rating

Nature of impact	Status (negative of positive)	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceability	Significance (no mitigation)	Mitigation/Management Actions	Significance (with mitigation)	Confid level
CONSTRUCTION PHASE											
Jacobs Bay Corridor (assuming unmitigated alternative is along southern side of the road)											
Wetland 1 Wetland disturbance, compaction and infilling	**Negative**	**Regional**	**Permanent**	**Medium**	**High**	**Low**	**High** – Wetland 1 is considered of high ecological importance	**High**	• Avoidance of wetland 1 by routing pipeline along northern side of road • Implement measures to prevent contamination of wetlands with construction material and minimise disturbance footprint, as per CEMP • Time construction within wetland areas for outside of the wet season • Rehabilitate disturbed areas north of the road such that pre-construction levels are retained along the pipeline corridor and wetlands are not thus infilled	**Low**	**Medium** – Visual assessments only
Wetland 2 Wetland disturbance, compaction and infilling	**Negative**	**Local**	**Permanent**	**Low to Medium**	**High**	**Medium to High**	**Medium to High** – system earmarked for rehabilitation	**Medium**	• Implement measures to prevent contamination of wetlands with construction material and minimise disturbance footprint, as per CEMP • Time construction within wetland areas for outside of the wet season • Rehabilitate disturbed areas such that pre-construction levels are retained along the pipeline corridor and wetlands are thus not infilled	**Low**	**Medium** – Visual assessments only

8 ENVIRONMENTAL MANAGEMENT AND MONITORING

DEAT (2004) defines environmental auditing as “a process whereby an organisation’s environmental performance is tested against its environmental policies and objectives.” Monitoring and auditing is an essential environmental management tool which is used to assess, evaluate and manage environmental and sustainability issues:

In order to ensure that the objectives of sustainable development and integrated environmental management are met and in order to obtain data which can inform continuous improvement of environmental practices at the site (adaptive management), monitoring and reporting will be an essential component of the proposed operations.

Monitoring and management actions associated with the project are contained in the EMPr (refer to Section B of the EIR) as well as in the various specialist reports associated with this project. This section provides a summary of the critical monitoring aspects associated with the relevant water resources.

8.1 General Monitoring and Management

The Environmental Control Officer (ECO) will be responsible for overseeing the implementation of the EMP during the construction and operations phases, and for monitoring environmental impacts, record-keeping and updating of the EMP as and when necessary.

During construction, the Environmental Control Officer will be responsible for the following:

- Meeting on site with the Construction Manager prior to the commencement of construction activities to confirm the construction procedure and designated activity zones;
- Weekly or bi-weekly (i.e. every two weeks) monitoring of site activities during construction to ensure adherence to the specifications contained in the EMP, using a monitoring checklist that is to be prepared by the ECO at the start of the construction phase;
- Preparation of the monitoring report based on the weekly or bi-weekly site visit;
- Conducting an environmental inspection on completion of the construction period and ‘signing off’ the construction process with the Construction Manager.

During operation, the Environmental Control Officer will be responsible for:

- Overseeing the implementation of the EMP for the operation phase;
- Ensure that the necessary environmental monitoring takes place as specified in the EMP;
- Update the EMP and ensure that records are kept of all monitoring activities and results.

During decommissioning, the Environmental Control Officer will be responsible for:

- Overseeing the implementation of the EMP for the decommissioning phase;
- Conducting an environmental inspection on completion of decommissioning and ‘signing off’ the site rehabilitation process.

8.2 Measures for the prevention of spillages and leakages

All transfer pumps will be fitted with variable speed drives. This allows for an automated flow control system whereby a high-water level in the transfer tank will result in a maximum pump speed and flow rate, whilst a low water level will result in a minimum pump speed and flow

rate.

Should the high-water level be reached in the transfer tank and continue to rise due to a pump that is malfunctioning or the inflow to the transfer tank is more than the outflow, alarm 1 will be activated (See Figure 8-1). When the transfer tank is about to overflow, alarm 2 will be activated. At this point, feeding pipes to the transfer tank will close to effect effluent storage at the individual storage tanks on site. Should the transfer tank overflow the spillages will be contained in a bunded area. The bunded areas will be constructed with lined and impermeable floors.

Flow and pressure instruments will be installed on the pipeline and monitored continuously via a programmable logic control (PLC) system. Software will be utilised to compute a real time mass flow measurement and a compensated volume balance of the system will be determined. The volume balance will be continuously monitored to determine any loss of volume of the system. Thus a real time leak detection system will be established. A similar leak detection system is utilised in the petroleum industry for buried pipelines. Furthermore, a scheduled maintenance pressure test will be performed as an additional preventative measure to detect any leaks (CSIR, 2014).

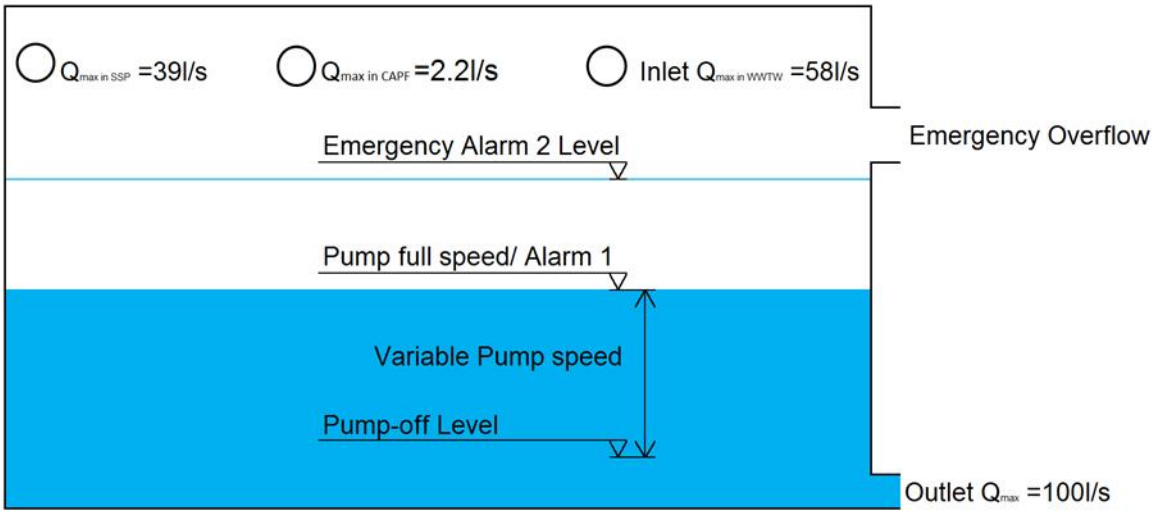

Figure 8-1: Transfer tank level indicators for Design Philosophy

The pump station transfer tanks (comprising a volume of 15 m3 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.

Pressure transmitters will be installed in the main suction and delivery lines of the pump station. A pressure transmitter will have a stainless steel body, with a diaphragm type element.

The pressure transmitters will also act as a protective measure for the pump sets. When the pressure in the pipeline reduces excessively, the pump sets will be automatically tripped by the PLC.

A generator with a fuel tank (diesel; capacity of 600 litres) will be installed at each pump station. The generator will be installed in a dedicated standby generator room, inside the pump station building. The generator will be installed within a bunded area to ensure fuel is contained in the event of spillage. The bunded wall will be designed to contain 110 % of the maximum fuel that can be stored in the fuel tank of the generator (CSIR, 2014).

9 PUBLIC PARTICIPATION

Public Participation is one of the most important aspects of the environmental impact assessment and environmental authorization processes. This stems from the requirement that people have the right to be informed about potential decisions that may affect them and that they must be afforded an opportunity to influence those decisions. Effective public participation also improves the ability of the competent authority to make informed decisions and result in improved decision-making as the views of all parties are considered.

The Public Participation Process:

- Provides an opportunity for interested and affected parties (I&AP) to obtain clear, accurate and comprehensive information about the proposed activity, its alternatives or the decisions and the environmental impacts thereof;
- Provides I&APs with an opportunity to indicate their viewpoints, issues and concerns regarding the activity, alternatives and/or the decisions;
- Provides I&APs with the opportunity to suggest ways of avoiding, reducing or mitigating negative impacts of an activity and for enhancing positive impacts;
- Enables an applicant to incorporate the needs, preferences and values of the affected parties into the activity;
- Provides opportunities to avoid and resolve disputes and reconcile conflicting interests;
- Enhances transparency and accountability in decision – making.

Public Participation therefore allows interested and affected parties (I&APs) the opportunity to give their viewpoints and influence the process and the decisions of the competent authority.

The following process was undertaken to facilitate the public participation for the proposed project thus far. Reference is also made to the proposed future consultations that would take place in subsequent project phases.

9.1 Pre-application Meeting and Site Visit

A pre-application meeting for the SP IWULA during which the proposed SRMOP was also discussed took place with the DWS and DEA:O&C on the 14th of July 2013. Please refer to Appendix H of the EIR for the minutes of the meeting. Another focus group meeting was held with DEA:O&C on the 4th of August 2014 and 20th of August 2014. Please refer to Chapter 6 of the EIR.

A site visit took place with the DWS on 25 November 2014 for the proposed SP and SRMOP. The site visit was conducted by Mr Warren Dreyer from DWS who is the responsible official for both the proposed SP IWULA and the SRMOP IWULA.

9.2 Newspaper Advertisement

Advertisements, notifying the public of the Environmental Authorisation application process and requesting I&AP's to register their comments with the CSIR, was placed in local and provincial newspapers, i.e. the "Weslander "(5 September, 2013) and the "Burger" (6 September, 2013); in accordance with regulation 54(2)(c) of the EIA Regulations.

9.3 Site notices

In order to inform surrounding communities and adjacent landowners of the proposed development, notice boards (in accordance with regulation 54(2)(a) and 54(3) of the EIA Regulations) were erected at the following places on the 6 September 2013:

Site Notice No:	Placement:	Coordinates:
Site Notice 1	R27 West Coast Road	32° 58' 28'' S, 18° 5' 8'' E
Site Notice 2	Trunk Road R85 – Farm Gate	32° 59' 19'' S, 18° 5' 14'' E
Site Notice 3	Trunk Road R85 – Farm Gate	32° 59' 41'' S, 18° 4' 54'' E
Site Notice 4	Trunk Road R85/Transnet – Salkor Road	32° 59' 57'' S, 18° 4' 24'' E
Site Notice 5	R85 & R399 Intersection	32° 55' 45'' S, 17° 58' 25'' E
Site Notice 6	Jacobsbaai & Swartriet Roads	32° 57' 12'' S, 17° 53' 42'' E
Site Notice 7	Jacobsbaai	32° 59' 14'' S, 17° 54' 23'' E
Site Notice 8	Tabakbaai	33° 00' 39'' S, 17° 56' 10' E
Site Notice 9	Saldanha Bay Public Library	33° 00' 10'' S, 17° 56' 48'' E

9.4 Direct Notification of Identified I&APs

Relevant organs of state and I&AP were directly informed of the proposed development. A Background Information Document (BID) and Comment Form was emailed to I&APs on the 6th of September, 2013.

9.5 I&APs comments on submissions

In accordance with the EIA Regulations of 2010 and in the interest of promoting an open and transparent approach to the EIA process, registered I&APs are afforded reasonable opportunity to comment on all draft and final submissions made to competent authorities. This included the following:

9.6 Review of Draft EIR and EMP

This process entailed the release of the Draft EIR for a 40-day public and authority review period. Relevant organs of state and I&APs were informed of the review process in the following manner:

- Advertisements placed in one local and one regional newspaper;
- A letter (Letter 4) to all I&APs (including authorities), with notification of the 40-day public review period for the Draft EIR and invitation to attend the Public Open Day;

The Draft EIR and Draft EMP was made available and distributed through the following mechanisms to ensure access to information on the project and to communicate the outcome of specialist studies:

- Copies of the report was placed at the Saldanha Bay and Louwville (Vredenburg) Public Libraries and at the Jacobsbaai Ratepayers and Residents Association office;

- Relevant organs of state and I&APs on the database received notification of the Draft EIR via email or letters where possible;
- Relevant organs of state and key I&APs were provided with a hard copy and/or CD of the report; and
- Report was placed on the project website: www.csir.co.za/eia/frontier_marine_outfall_pipeline.html

9.7 Review of Final EIR and EMP

The Final EIR, including the Comments and Responses Trail and EMP, will be made available to all registered I&APs for a 30 day review period. A letter will be sent to all I&APs on the project database notifying them of the release of the Final EIR. The Final EIR will be distributed as follows:

- Copies of the report will be placed at the Saldanha Bay and Louwville (Vredenburg) Public Libraries and at the Jacobsbaai Ratepayers and Residents Association office;
- All I&APs (including organs of state) on the database will receive notification of the Final EIR via email and letters where possible;
- Relevant organs of state and key I&APs will be provided with a hard copy and or CD of the report; and
- Report to be placed on the project website: www.csir.co.za/eia/frontier_marine_outfall_pipeline.html

9.8 Public Meetings

A Public Open Day was held on the 30th of October 2013 at the Protea Hotel in Saldanha Bay. Please refer to Appendix H of the EIA Report for the notes from the Public Open Day Meeting as well as the attendance register.

9.9 Key Issues

Public participation is an on-going and iterative process which will continue throughout the EIA process. The key issues that have been identified through consultation with I&APs thus far include:

- Issues related to Terrestrial Biodiversity, including vegetation (Critical Biodiversity Areas (CBAs));
- Issues related to Water Quality and impacts on Marine ecology;
- Issues related to Pipeline Routes and servitude;
- Issues related to Landownership;
- General issues;
- Issues related to Waste and Waste Water Management;
- Issues related to Road Networks;
- Issues related to Aquaculture and Marine Ecology;
- Issues related to Heritage;
- Issues related to Rare Earths;

- Issues related to environmental impacts;
- Issues related to Integrated coastal management, coastal public property, coastal protection zone & coastal access; and
- Issues related to Water.

These concerns have been addressed through several mitigation measures that will be implemented in the planning, construction, operational and decommissioning phases. For the full overview of correspondence with the various stakeholders, please refer to Appendix G of the EIR.

10 SECTION 27 MOTIVATION

The purpose of the Section 27 motivation is to provide assessment information with regards to equity, the need to redress the results of past racial and gender discrimination, and economic empowerment of historically disadvantaged individuals. Considerations as per section 27 of the National Water Act (Act 36 of 1998) follow:

10.1 (a) Existing lawful water uses in terms of section 35

This report supports the application for a new Integrated Water Use Licence, and there are no existing water uses along the proposed pipeline route apart from existing pipelines which cross water courses along the route.

10.2 (b) The need to redress the result of the past racial and gender discrimination

Frontier Saldanha Utilities (Frontier Utilities) is committed to complying fully with the requirements and spirit of the Broad Based Socio Economic Empowerment Charter and the Employment Equity Act 55 of 1998. The Company will apply non-discriminatory employment practices in which employees are treated the same at all levels, regardless of their background, race, gender or disability. Frontier Utilities commits to, and supports the principles of employment, development and advancement of HDSAs.

With Frontier Utilities' project being a new operation, the recruitment process will be aimed at achieving a minimum of 40% HDSAs in management and 10% women overall during the construction phase. It is envisaged that this will be achieved by the following:

- Appointment of suitably qualified HDSAs through targeted advertising and adherence to unbiased selection criteria;
- Identifying HDSAs and female employees who have the potential to be fast-tracked, particularly in supervisory and management positions;
- Accelerated training for new HDSAs and female recruits with high potential and implementation of job mentoring and coaching;
- Implementing management development training programmes to enhance skills and develop the potential of HDSAs and women;
- Implement measures to create a corporate culture which recognizes diversity in the workplace and harnesses the potential of all employees through programmes for all staff, including management, promoting employment equity and sensitizing employees with regard to issues such as race, gender, disability and religion.

Furthermore, Frontier Utilities supports the transformation and alignment of the objectives in relation to procurement as set out in the Broad Based Socio Economic Empowerment Charter and is committed to the establishment and growth of Small and Medium Enterprises. The net result of this initiative will be to drive greater levels of spend with HDSA suppliers. A vital component of this plan will be to ensure that HDSA procurement spend in the Saldanha Bay and Western Cape region is maximized.

10.3 (c) Efficient and beneficial use of water in the public interest

All water will be used as described by DWS's Best Practice Guidelines.

10.4 (d) The socio-economic impact of the water use or uses if authorised or of the failure to authorise the water use or uses

The proposed pipeline cannot commence without the IWUL and thus the employment opportunities and socio-economic upliftment which is expected as a result of the proposed pipeline (refer to the Economic Assessment Report, Appendix F of the Environmental Impact Assessment Report), will not be realized if the pipeline is not developed. The construction and operational phase of the project would both result in spending injections that would lead to increased economic activity best measured in terms of impacts on employment and associated incomes focusing on the local area and region. Construction expenditure would constitute a positive injection of new investment. Preliminary estimates indicate that a total of approximately R113 million would be spent on all aspects of construction over 12 to 18 months.

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.

Approximately 164 temporary construction jobs with duration 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 the local area falling within the Saldanha Bay Municipal area 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.

Furthermore, the proposed SRMO Project would be a pre-requisite for the development of the proposed Chlor Alkali Production facility (CAPF) and the Rare Earth Separation Plant (SP) as the both facilities would only be technically feasible if process effluent can be legally disposed of. The benefits associated with the CAPF and the SP can therefore be viewed as indirect or facilitated benefits of the SRMO Project.

Should the water use license be refused the proposed development will not take place and the possible economic benefits and social upliftment related to both the pipeline, the CAPF and the SP will not be realised.

10.5 (e) Any catchment management strategy applicable to the relevant water resource

The Saldanha region is located in Water Management area number 19 The Berg. The entire Saldanha region and the proposed pipeline are located in quaternary drainage region G10M. Please refer to Figure 6-7.

The Berg water management area commands the south-western corner of South Africa. The Berg River is the only major river in the water management area, although there are several smaller rivers and streams draining to the ocean. High mountain ranges characterise the east and south-east of the water management area, from where most of the runoff originates, the most well-known being Table Mountain and the Cape Peninsula mountains in the south-west. Sandy lowlands, with minimal runoff, extend across the central and western part of the water management area (National Water Resource Strategy, 2004).

10.6 (f) The likely effect of the water use to be authorised on the water resource and on other uses

The EIA for the proposed SRMO Project is inclusive of several completed studies aimed to determine the possible effects of the project on the potentially affected water resources in the region (and consequently the effect on other users of these water resources). These studies include:

- Wetland Impact Assessment: CSIR, 2014.
- Terrestrial Ecology Study: Nick Helme Botanical Surveys, 2014.

The most relevant conclusions from these studies in terms of the potential impacts of the project on water resources in the vicinity of the pipeline are summarized in Table 10-1.

Table 10-1: The likely effect of the water use to be authorised on the water resource and on other uses

Identified Impact	Impact Assessment	Proposed Mitigation
• 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.	The identified impacts would be considered highly undesirable in the case of the delineated wetland 1 on the southern side of the Jacobs Bay Road. The impacts are likely to be permanent and of medium intensity, and although taking place within only a small portion of the wetland, would be considered as taking place at a regional scale, given the conservation importance of Wetland 1. The overall significance of the above impacts in this area would be considered negative and high before mitigation and negative and low after mitigation. In the case of the wetlands north of wetland 1, on the northern side of the Jacobsbaai Road, although the impacts would still be negative, their scale and intensity would all be low, given the extent of degradation that has already occurred in this area. The overall significance of the above impacts in this area would be considered negative and medium to low. In the case of wetland 2, comprising the Bok River valley bottom wetland, installation of the pipelines would be likely to trigger most of the identified impacts, over a highly localised area, but nevertheless an area with implications for flow along the channel. Creation of a raised mound over the pipeline to ensure sufficient cover would potentially result in pooling of flows upstream of the culvert.	The following mitigation measures are recommended: • Avoidance of wetland 1 on the southern side of the road, by routing the pipelines along the northern side of the Jacobsbaai Road only; • Compilation of, and strict adherence to, a construction phase EMPR which outlines measures to: – prevent the passage of sediment or other contaminated material into adjacent wetlands; – minimise the disturbance footprint; and – ensure that all wetlands south of the road are treated as no go areas – including the wetland margins in the southern road reserve; • Managing the timing of construction through wetland areas such that it takes place outside of the wet season, and preferably during late summer / autumn, so that the period before plants re-establish in the wet season is limited; and • Rehabilitation of disturbed areas so that pre-construction levels are achieved, and such that the pipeline does not result in the creation of a longitudinal raised mound – this measure could entail spreading of excess fill into disturbed terrestrial areas; fill should not be spread into any

	The intensity of these impacts is considered low, and they would occur at a very local scale. They would however affect a system earmarked for long-term improvement and would thus be considered negative and of medium significance without mitigation. After mitigation, the impacts are rated as negative and of low significance.	wetland areas.

The impact of the pipeline development on the wetlands should be minimised due to the proposed mitigation and management measures to be implemented.

10.7 (g) The class and resource quality objectives of the water resource

More information with regards to the resource quality objectives is to be provided by the Department.

The area in which the proposed pipeline is located has two wetland features within 500m of the proposed pipeline route. In addition, an artificial dam and quarry is also located along the proposed pipeline route alignment.

Water level depths in the area are approximately between 2.7 and 4.1 m below ground level.

With regards to water quality:

The very high salt loads in the groundwater render the water unacceptable. The water quality analyses of the water found at the separation plant site in the eight groundwater monitoring boreholes confirms high sodium, magnesium, chloride, EC and TDS values.

10.8 (h) Investments already made and to be made by the water user in respect of the water use in question

Investments with regards to time and money spent on the project up to now includes the compilation of the scoping and EIA report, public participation processes and associated specialist studies, as well as investment made in terms of the pipeline design. Associated costs up to now amounts to more than R6.7m. Further investments will be made once authorizations are in place and construction commences.

10.9 (i) The strategic importance of the water use to be authorised

This water use is not identified as a strategic water use as described by the Department.

10.10 (j) The quality of water in the water resource which may be required for the reserve and for meeting international obligations

No water quality or other raw date exists for the wetlands. According to the State Saldanha Bay and Langebaan Lagoon report for 2013/2014, regular monitoring of microbiological indicators at 20 stations in the Bay (10 in Small Bay, 5 in Big Bay and 5 in Langebaan Lagoon) was initiated by the Saldanha Bay Water Quality Trust (SBWQT) in 1999 and has continued since this time with the assistance of the SBM. These data indicate that chronic problems with faecal coliform pollution were present in the early parts of the record but that conditions have improved considerably since this time. Currently, the situation in Small Bay remains a concern, with three sites exceeding the 80th percentile levels and five sites exceeding the 95th percentile levels for safe mariculture practices, and two sites exceeding the 80th percentile levels for safe recreational activities in 2014. An increasing trend in faecal coliform counts in Langebaan is also cause for concern, and although microbial counts are still within the recreational use guidelines, this is the only site outside of Small Bay that exceeded the mariculture guidelines. Given the current importance and likely future growth of both the mariculture and tourism industries within Saldanha Bay, it is imperative that whatever efforts have been taken in recent years (e.g. upgrading of sewage and storm water facilities to keep pace with development and population growth) to combat pollution by faecal coliforms in Small Bay should be increased and applied more widely. Continued monitoring of bacterial indicators (intestinal

Enterococci in particular), to assess the effectiveness of adopted measures, is also required and should be undertaken at all sites on a bimonthly basis.

Concentrations of trace metals in marine organisms (mostly mussels) in Saldanha Bay have historically been monitored on a routine basis by the Department of Environmental Affairs (DEA) and by mariculture farm owners. DEA discontinued mussel watch programme in Saldanha Bay in 2007, but this has now been incorporated into the State of the Bay surveys. Data suggest that concentrations of trace metals are high along the shore (particularly for lead near the Multipurpose Quay) and are frequently or even consistently above published guidelines for foodstuffs. Concentrations of trace metals in the cultured mussel in the Bay offshore are much lower though, and are currently not of concern. The high concentrations of trace metals along the shore points to the need for management interventions to address this issue, as metal contamination poses a very serious risk to the health of people harvesting mussels from the shore. It is vitally important that this monitoring continues in the future and that data are made available to the public for their own safety (Anchor Environmental; 2014).

Frontier Utilities is a member of the Saldanha Bay Water Quality (SBWQ) Forum and the Forum has extended their monitoring campaign to include the Danger Bay area.

10.11 (k) The probable duration of any undertaking for which a water use is to be authorised

The proposed pipeline will be designed with a potential lifespan of approximately 30 years; however, it is envisaged the WCDM desalination plant will be commissioned well within this period and that the marine component of the SRMO will be decommissioned and rehabilitated (i.e. there will be a shared outfall facility utilised by the WCDM desalination plant and the effluent emanating from the SRMO). The SRMO will also service other industrial developments in the area and the IWUL may have to be extended at a later stage.

11 CONCLUSION AND RECOMMENDATION

The following Section 21 Water Uses are associated with the proposed SRMOP, and form part of this IWUL Application. These water uses are each fully discussed in Section 5 of this report.

Table 11-1: Water Uses applied for

Water use	Action	Feature	Description
21 (c)	impeding the flow of water in Wetland 1 and 2	Pipeline crossing Wetland 1 and 2	impeding or diverting the flow of water in a watercourse
21 (i)	altering the banks of Wetland 1 and 2	Pipeline crossing Wetland 1 and 2	altering the bed, banks, course or characteristics of a watercourse

Numerous specialist studies have been associated with the EIA Phase of this project, including a Wetland Impact Assessment (Van der Walt, 2014).

The above study found that, routing the pipeline corridor along the Jacobs Bay Road (WCDM 10 m servitude) would potentially affect wetlands in the area of Wetlands 1 and 2.

Impacts associated with the pipeline construction would be considered highly undesirable in the case of the delineated wetland 1 on the southern side of the Jacobs Bay Road. The impacts are likely to be permanent and of medium intensity, and although taking place within only a small portion of the wetland, would be considered as taking place at a regional scale, given the conservation importance of Wetland 1. The overall significance of the above impacts in this area would be considered high.

In the case of the wetlands north of wetland 1, on the northern side of the Jacobs Bay Road, although the impacts would still be negative, their scale and intensity would all be low, given the extent of degradation that has already occurred in this area. The overall significance of the above impacts in this area would be considered medium to low.

In the case of wetland 2, comprising the Bok River valley bottom wetland, installation of the pipelines would be likely to trigger impacts over a highly localised area, but nevertheless an area with implications for flow along the channel. Creation of a raised mound over the pipeline to ensure sufficient cover would potentially result in pooling of flows upstream of the culvert. The intensity of these impacts is considered low, and they would occur at a very local scale. They would however affect a system earmarked for long-term improvement and would thus, without mitigation measures, be considered of at least medium significance.

The study recommended that Wetland 1 on the southern side of the road be avoided, by routing the pipelines along the northern side of the Jacobsbaai Road through the disturbed portion of an ephemeral pan. Although the assessed pipeline corridor along the Jacobsbaai Road will still cross through Wetland 2 (which is of high conservation importance), effective mitigation is considered possible in all cases.

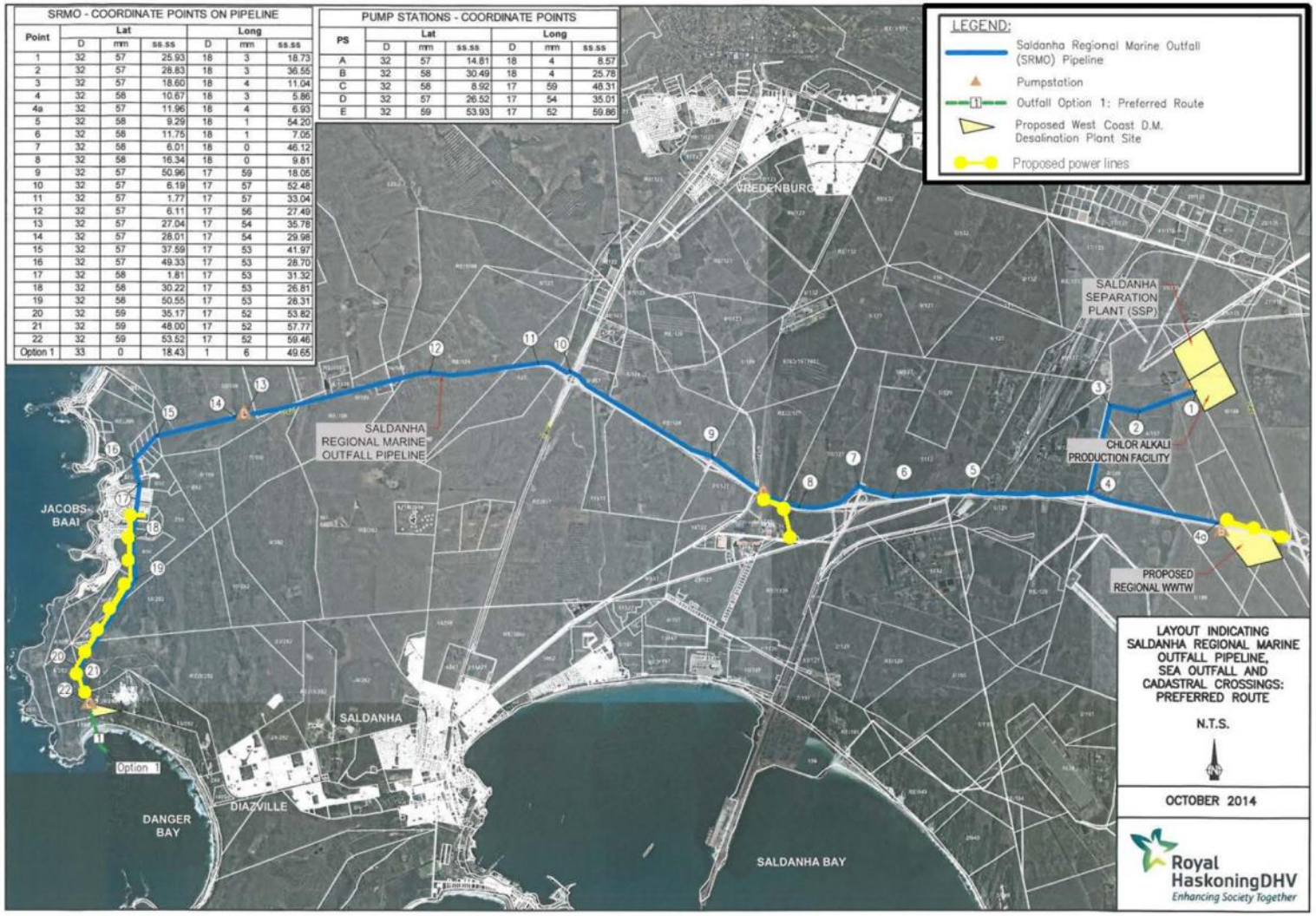

Figure 11-1: Final layout of proposed SRMOP pipeline route

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13 APPENDICES

14 APPENDIX A: APPLICATION FORMS

15 APPENDIX B: PROOF OF PAYMENT

16 APPENDIX C: TITLE DEEDS

17 APPENDIX D: CERTIFIED ID COPY

18 APPENDIX E: BUSINESS REGISTRATION CERTIFICATE