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

FINAL EIA REPORT

CHAPTER 2:

PROJECT DESCRIPTION

CONTENTS

TABLES

FIGURES

2 PROJECT DESCRIPTION

2.1 BACKGROUND

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):

- a Rare Earth Element (REE) Separation Plant [referred to as the Saldanha Separation Plant (SSP)] proposed by Frontier Separation) (EIA being undertaken by AGES, Environmental Decision pending, Application Ref No. 16/3/1/2/F4/17/3004/13);
- a Chlor-Alkali Production Facility (CAPF) proposed by Chlor-Alkali Holdings Pty (Ltd) (CAH) (EIA 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).

Frontier Utilities appointed Royal HaskoningDHV (Pty) Ltd (RHDHV) and WorleyParsons (WP) to complete a Feasibility Study for the SRMO Project (Annexure 1 of Volume III of this report).

Figure 2.1 shows the overall layout of the SRMO Project, including the different routing and marine outfall alternatives that were included in this EIA. Please note as referred to in Chapter 1, although the Jacobsbaai Eastern Corridor (Alternative Route 1, Figure 2.1) was included and assessed as an alternative in this EIA, this alternative was deemed unfeasible. This is due to the fact that one of the affected land owners along the Jacobsbaai Eastern Corridor (Mr Smit of Forellendam (Pty) Ltd) objects to registering a servitude on his land. The Jacobsbaai Western corridor has therefore been selected as the preferred alternative for the proposed SRMO Project.

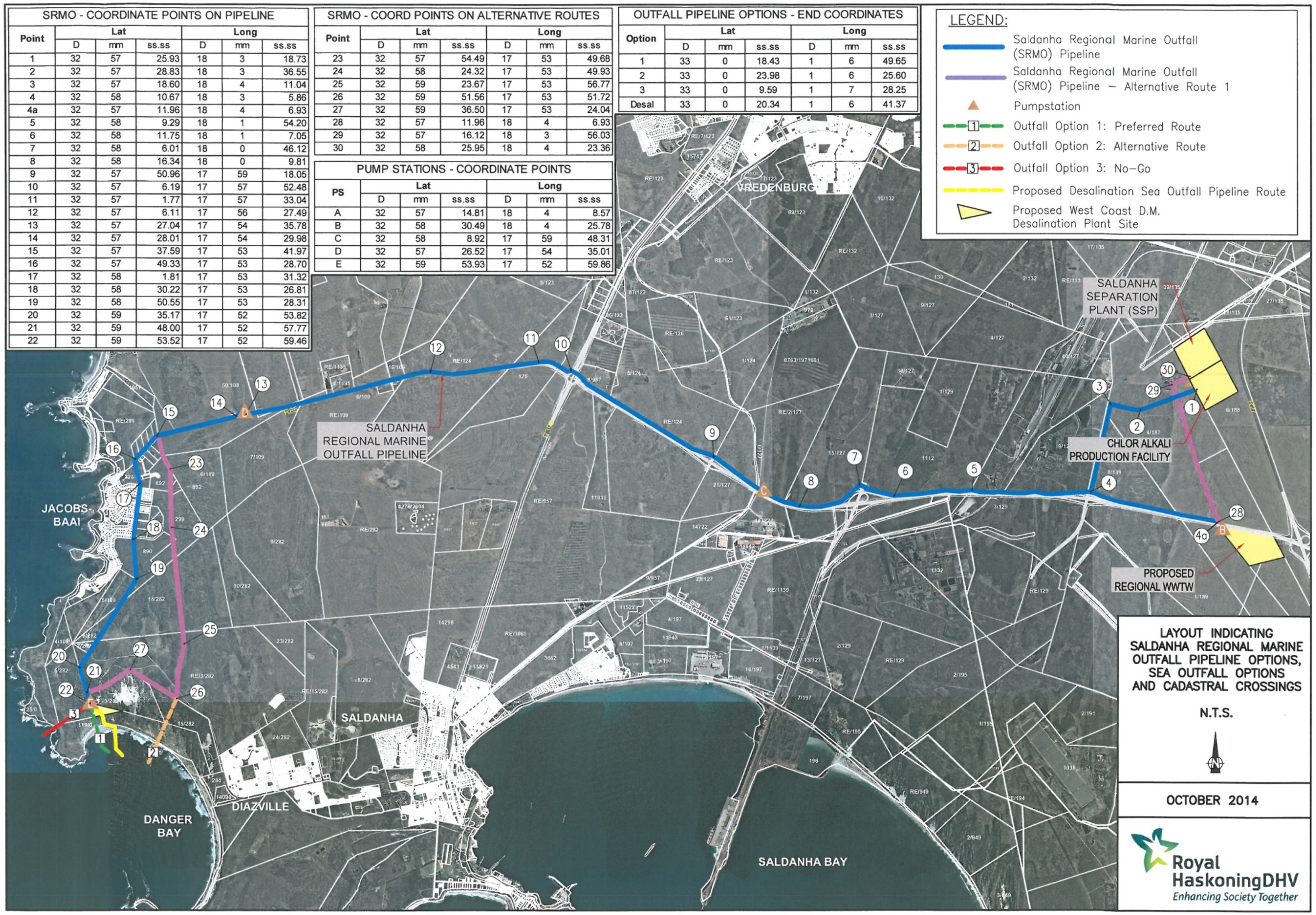
The treated effluent is proposed to be disposed via the brine return disposal infrastructure of the proposed WCDM desalination plant. However, the possibility exists that construction of the desalination plant might be delayed. Consequently, this EIA for the proposed SRMO Project investigates an alternative sea disposal option for interim effluent disposal (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). The preferred options for marine disposal were determined to be Options 1 (Preferred) and 2 (Alternative) (see Figure 2.3b) and continues directly south towards the sea after the SRMO pipeline reaches the site of the proposed WCDM desalination plant.

This chapter provides a description of the terrestrial pipeline and its associated infrastructure, the marine outfall, the pipeline routing and the composition of the effluent that was assessed as part of the EIA.

The section below provides a summary of what the project will comprise of:

- A terrestrial pipeline corridor (see Figure 2.1). This corridor will be approximately 27 km long from the proposed SSP proposed by Frontier Separation to the outfall in Danger Bay. The pipeline will have a diameter of approximately 900 mm and will be constructed from high density polyethylene (HDPE) or will be a glass reinforced plastic (GRP) pipe;
- Electrical corridors connecting to the pump stations. Either Medium Voltage (MV) cabling — which will be buried depending on the width of the pipeline servitude — will be utilised or Medium Voltage Overhead Lines (OHL) in traditional Delta A-Frame positions (wooden poles), at a height of 12 m, will be used;
- Five pump stations including brine transfer tanks, mechanical pumps, electrical distribution networks and standby generator located within the servitude located at positions A, B, C, D and E (refer to Figure 2.1 and 2.2);
- Gravel service and access roads to the pumps stations; and
- A marine outfall with diffuser system in Danger Bay.



SRMO - COORDINATE POINTS ON PIPELINE

Point	Lat			Long		
	D	mm	ss.ss	D	mm	ss.ss
1	32	57	25.93	18	3	18.73
2	32	57	28.83	18	3	36.55
3	32	57	18.60	18	4	11.04
4	32	58	10.67	18	3	5.86
4a	32	57	11.96	18	4	6.93
5	32	58	9.29	18	1	54.20
6	32	58	11.75	18	1	7.05
7	32	58	6.01	18	0	46.12
8	32	58	16.34	18	0	9.81
9	32	57	50.96	17	59	18.05
10	32	57	6.19	17	57	52.48
11	32	57	1.77	17	57	33.04
12	32	57	6.11	17	56	27.49
13	32	57	27.04	17	54	35.78
14	32	57	28.01	17	54	29.98
15	32	57	37.59	17	53	41.97
16	32	57	49.33	17	53	28.70
17	32	58	1.81	17	53	31.32
18	32	58	30.22	17	53	26.81
19	32	58	50.55	17	53	28.31
20	32	59	35.17	17	52	53.82
21	32	59	48.00	17	52	57.77
22	32	59	53.52	17	52	59.46

SRMO - COORD POINTS ON ALTERNATIVE ROUTES

Point	Lat			Long		
	D	mm	ss.ss	D	mm	ss.ss
23	32	57	54.49	17	53	49.68
24	32	58	24.32	17	53	49.93
25	32	59	23.67	17	53	56.77
26	32	59	51.56	17	53	51.72
27	32	59	36.50	17	53	24.04
28	32	57	11.96	18	4	6.93
29	32	57	16.12	18	3	56.03
30	32	58	25.95	18	4	23.36

PUMP STATIONS - COORDINATE POINTS

PS	Lat			Long		
	D	mm	ss.ss	D	mm	ss.ss
A	32	57	14.81	18	4	8.57
B	32	58	30.49	18	4	25.78
C	32	58	8.92	17	59	48.31
D	32	57	26.52	17	54	35.01
E	32	59	53.93	17	52	59.86

OUTFALL PIPELINE OPTIONS - END COORDINATES

Option	Lat			Long		
	D	mm	ss.ss	D	mm	ss.ss
1	33	0	18.43	1	6	49.65
2	33	0	23.98	1	6	25.60
3	33	0	9.59	1	7	28.25
Desal	33	0	20.34	1	6	41.37

Figure 2.1 Project layout of the proposed Saldanha Regional Marine Outfall Project

2.2 PIPELINE DESIGN AND DESCRIPTION

2.2.1 Pipeline design principles

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 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 SSP 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[1], as per Figure 2.1, 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 this FEIAR);
- Five pump stations to be located along the pipeline corridor (Pumps stations A-E as indicated in Figure 2.1). It is estimated that each transfer pump station will require 315 kVA. The Saldanha Bay Municipality (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 B5). Eskom will provide electricity to the pump station at Position A and B (see letter from Eskom in Appendix B4). 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 SSP, the CAPF and the WWTW);
- The SRMO pipeline will extend from the pump station at the proposed SSP 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; Figure 2.1); and

[1] The Jacobsbaai Eastern Corridor was assessed as a pipeline routing alternative in this EIA. However, as explained in section 1.4.2 of Chapter 1, this corridor is no longer feasible. This is as certain land owners along the 'Jacobsbaai Road Eastern Corridor' were not amiable to negotiate the potential for registering a servitude over their properties, in particular Erf 299 owned by Forrelendam (Pty) Ltd. Erf 299 currently has approved development rights for building a residential estate on the property.

- The pipeline design excluded the transfer and disposal of effluent by future operations other than from the proposed SSP, CAPF, WWTW and the WCDM desalination plant. It is envisaged that future disposal into the SRMO 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.

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 (Proffered) = 440 m
- 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

2.2.2 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 SSP 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 either 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.

2.3 DESCRIPTION OF PROPOSED SRMO PIPELINE ROUTING

2.3.1 Terrestrial pipeline routing

In addition to the pipeline route for the WCDM desalination plant, Frontier Utilities included the route of the pipeline from the SSP to the connection with the Besaansklip Reservoir pipe route, running adjacent to the Provincial Road R85 (Jacobsbaai Road).

The SRMO pipeline will originate at the site for the proposed SSP (see Figure 2.2). Please note the positions A, B, C, D and E mentioned in this section are indicated in Figure 2.2. The proposed CAPF will be also be located at Position A, adjacent to the SSP. The proposed SRMO transfer pump station for the SSP and CAPF will be located at Position A. A new access road to the SSP will be constructed from the R85 road, approximately 1.5 km from the R27 intersection.

Figure 2.2 Proposed Saldanha Regional Marine Outfall Pipeline Terrestrial Routing (Blue corridor at Jacobsbaai is the Jacobsbaai Western Corridor (Preferred Alternative); Purple corridor at Jacobsbaai is the Jacobsbaai Eastern Corridor[1])

Legend: Position A (32° 57' 15.19" S 18° 04 05.03" E)=SSP and CAPF; Position B (32° 58' 24.1" S 18° 04' 18.67 E)=WWTW; Position C (32° 58' 07.86"S 17° 59' 43.89" E) = transfer pump station; Position D (32° 57' 14.58" S 17° 55' 44.92" E) = Vodacom substation; Position E (33° 00' 06.36" S 17° 53' 03.16" E) = Proposed WCDM desalination plant

The proposed site location for the SSP and CAPF are directly adjacent to the R27. The pipeline will run in a southern direction approximately 2 km from the SSP (Position A) before turning west at the R85 intersection (Position B). A transfer pump station will be constructed for effluent produced by the proposed SBM regional WWTW in the proximity of Position B (the final layout will depend on the results of the impact assessment phase of investigation).

The pipeline will be located on the northern side of the R85 road although both sides of the roads were investigated by the environmental specialist studies. The pipeline will run approximately 10 m from and parallel to the existing WCDM bulk potable water supply pipeline to the Besaansklip Reservoir. The pipeline will run in a westerly direction

[1] See footnote 1 on Page 2-6.

until it crosses the WCDM bulk potable water pipeline, approximately 500 m before the main entrance to Tronox's Namakwa Sands Smelter. The pipeline will cross the service road of Tronox Namakwa Sands and the Sishen Saldanha railway line. The pipeline will continue in a westerly direction, approximately 10 m north of the existing road reserve boundary fence and cross the access road to the Transnet/Salkor yard. A transfer pump station will be constructed at Position C.

The pipeline will continue 10 m north of the existing road reserve boundary fence and will cross various farm access roads and other dirt roads before intersecting with the R399 main road which connects Saldanha Bay and Vredenburg. The pipeline routing will continue in a westerly direction across various farm access roads and other dirt roads to Position D. A Vodacom substation is located at Position D and allowance was made for the pipeline to circumvent the substation.

From Position D, the pipeline routing will continue in a westerly direction approximately 10 m north of the R85 road. Approximately 550 m east of Jacobs Bay, the pipeline will either turn south, across the R85 road and follow the Jacobsbaai Eastern Corridor[1] or alternatively continue further west before turning south to follow the Jacobsbaai Western Corridor

For the Jacobsbaai Eastern Corridor (which is not a feasible option for the SRMO Project), the pipeline will run approximately 5 m east of the existing boundary fence, before crossing the fence approximately 600 m from the link road to Jacobs Bay. The pipeline will continue in a southerly direction to a point located approximately 750 m from the sea, before it will turn north-west directly below the dune line close to Danger Bay. The pipeline will follow a cadastral boundary and will then turn south to the proposed location of the proposed WCDM desalination plant at Position E. At this site, the proposed SRMO pipeline will be linked to the disposal infrastructure of the proposed WCDM desalination plant. However, should the desalination plant not be constructed and/or operational yet, a transfer pump station will be constructed to pump the effluent from Position E to an interim marine outfall (Marine Outfall Option 1 and 2).

The pipeline in the Jacobsbaai Western Corridor (preferred corridor alternative) will continue in a southerly direction within the road reserve to Position E which will be the proposed location of the WCDM desalination plant or final SRMO transfer pump station for marine disposal. The proposed pipeline between Positions A and D (17 800 m) will be a pumping main system with the various transfer pump stations located on-route. The pumping main system will lift effluent to a high point, located at Position D. A manhole will be located at Position D to serve as transition from the pumping system to the gravity system. The manhole will be vented to allow air into the pressure and the gravity systems.

The proposed pipeline between Positions D and E (approximately 8 700 m) will be a pressurised gravity system, where it will connect to either the WCDM's desalination plant brine return disposal infrastructure or the disposal infrastructure of the final

[1] See Footnote 1 on Page 2-6.

transfer pump station of the SRMO Project (should the desalination plant not be constructed and/or operational yet as mentioned above).

Detailed coordinates of the proposed pipeline routing alternatives are provided in Figure 2.1.

2.3.2 Marine outfall locations

The proposed SRMO pipeline transfer system will transfer treated industrial effluent from the proposed SSP, the CAPF and the WWTW via the terrestrial pipeline route described above to the sea, discharging at approximately 10 m water depth (10 m below Mean Sea Level (MSL)).

Ideally, the brine will be co-discharged with the effluent discharge system of the proposed WCDM desalination plant; however, at this stage the date of construction for the desalination plant is not known. The discharge design parameters of the marine outfall will influence the mixing behaviour of the effluent in the near-field region, which will extend up to a few hundred meters away from the outfall location. In the near-field, a velocity discontinuity between the effluent and the ambient flow will arise from initial momentum flux and buoyancy flux of the effluent. This will cause turbulent mixing, which will lead to entrainment of seawater in the brine and thereby decrease differences in salinity, temperature or residual chemicals between the effluent and ambient water body.

A comprehensive screening study was undertaken by WorleyParsons and CSIR to identify suitable marine pipeline routing alternatives and associated marine discharge points for Scenario 1 (Annexure 1 of Volume III). 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 2.3a). The preferred marine outfall alternatives are shown in Figure 2.3b. To determine the preferred route option, a matrix was developed consisting of relevant criteria separated into categories and subcategories against which each option could be measured. The assessment criteria categories identified as appropriate for the assessment were:

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

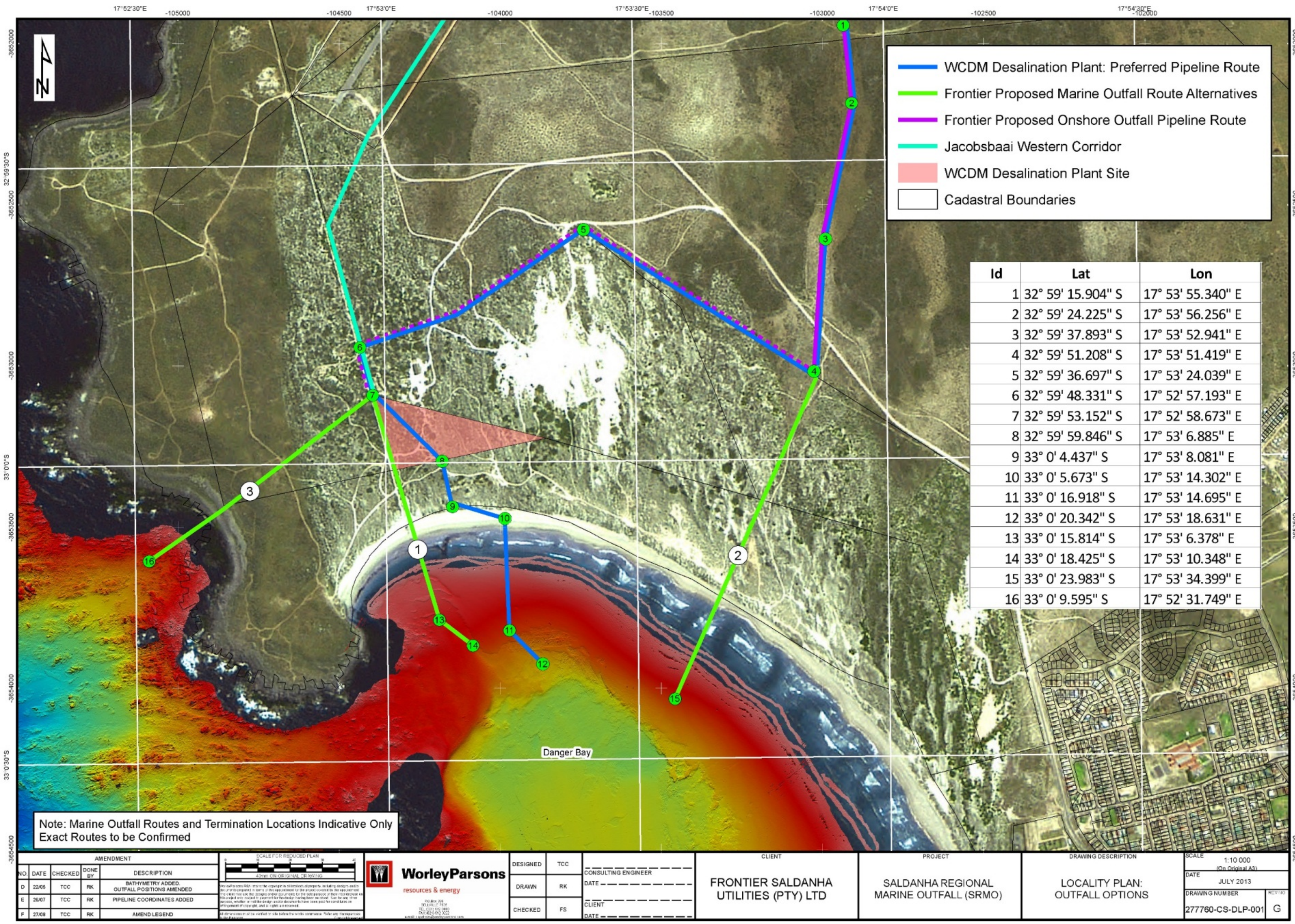


Figure 2.3a Frontier Utilities proposed marine outfall route alternatives

Note: Option 3 was not deemed feasible and was not assessed in the EIA process.

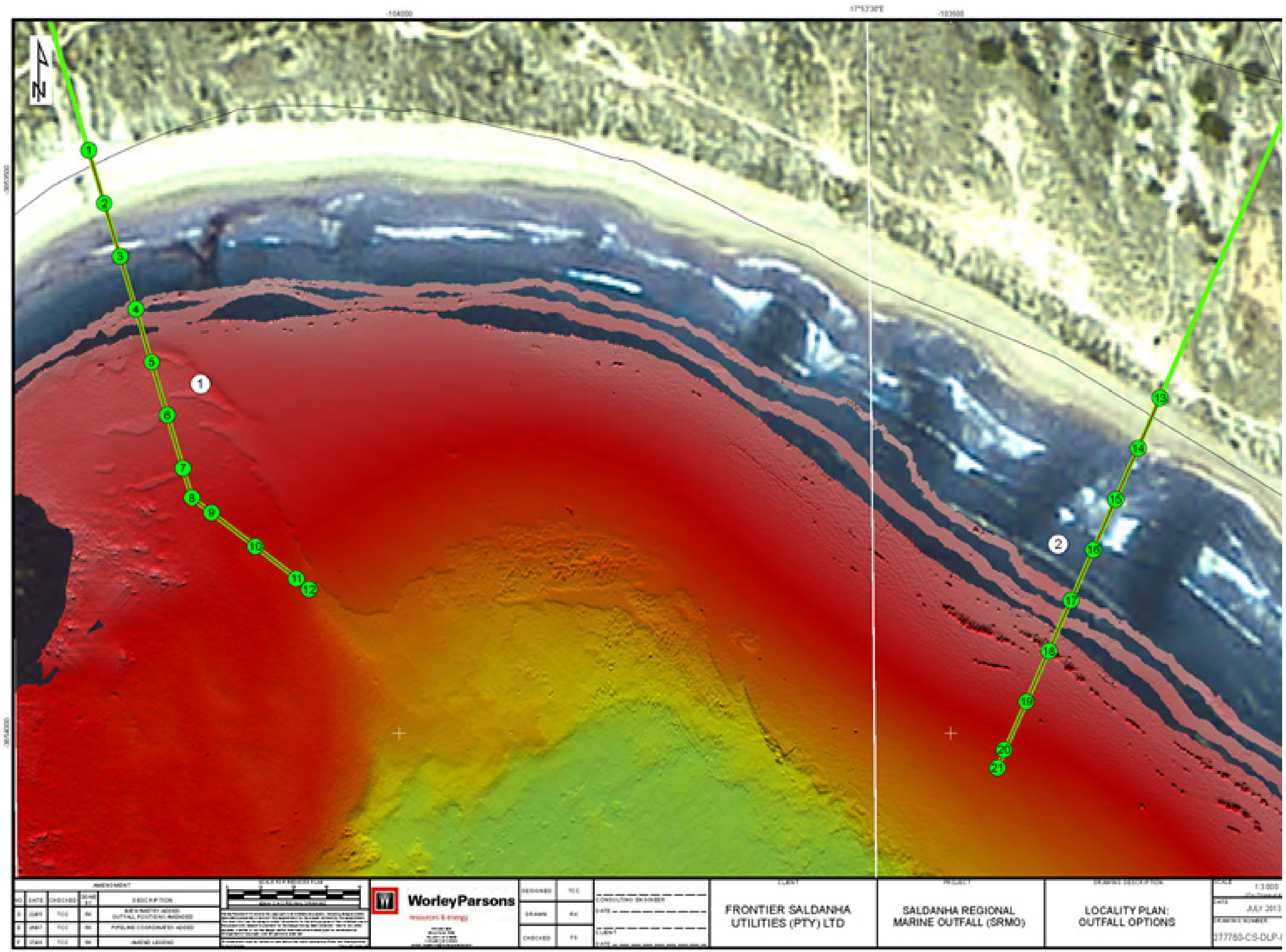


Figure 2.3b Locality map and preferred marine effluent pipeline options. Option 1 (Preferred), Option 2 (Alternative)

Id	Lat	Lon
1	33° 0' 5.587" S	17° 53' 2.901" E
2	33° 0' 7.147" S	17° 53' 3.431" E
3	33° 0' 8.707" S	17° 53' 3.962" E
4	33° 0' 10.267" S	17° 53' 4.492" E
5	33° 0' 11.827" S	17° 53' 5.023" E
6	33° 0' 13.387" S	17° 53' 5.553" E
7	33° 0' 14.947" S	17° 53' 6.084" E
8	33° 0' 15.814" S	17° 53' 6.378" E
9	33° 0' 16.258" S	17° 53' 7.053" E
10	33° 0' 17.257" S	17° 53' 8.571" E
11	33° 0' 18.255" S	17° 53' 10.089" E
12	33° 0' 18.425" S	17° 53' 10.348" E
13	33° 0' 13.187" S	17° 53' 40.218" E
14	33° 0' 14.664" S	17° 53' 39.422" E
15	33° 0' 16.142" S	17° 53' 38.625" E
16	33° 0' 17.619" S	17° 53' 37.829" E
17	33° 0' 19.097" S	17° 53' 37.032" E
18	33° 0' 20.574" S	17° 53' 36.236" E
19	33° 0' 22.052" S	17° 53' 35.439" E
20	33° 0' 23.529" S	17° 53' 34.643" E
21	33° 0' 23.983" S	17° 53' 34.399" E

Marine outfall route: Option 1

The Option 1 route connects to the onshore pipeline at the north corner of the proposed WCDM's desalination plant site. The pipeline then follows a route south along and just inside the desalination plant footprint western boundary and through the dunes to the sea. It is proposed that the pipe will continue along the same alignment through the surf zone to deeper water, however at some point it would likely be necessary for the pipe to turn south east to a discharge point in a less sheltered part of the bay for adequate dispersion of the effluent.

The principal philosophy behind the initial selection of this route as an option was:

- By following the boundary of the desalination plant site the potential disruption to/from the desalination plant construction would be reduced;
- The north-west end of the bay represents the most sheltered area for ease of construction for the pipeline; and
- The route represents the shortest direct route to the sea from the connection point.

Figure 2.4a Marine outfall route: Option 1

Marine outfall route: Option 2

The connection point for the Option 2 route would form an effective continuation of the desalination plant proposed pipeline route directly to the sea, southeast of the desalination plant site.

The principal philosophy behind the initial selection of this route as an option was:

- The total length of pipeline (onshore and offshore combined) to be constructed at this stage would be significantly reduced;
- A route avoiding the desalination plant and associated pipelines would minimise the potential disruption to/from the desalination plant construction; and
- Discharging the effluent into a significant distance from the desalination plant intake pipeline would reduce any potential recirculation issues for the desalination plant intake.

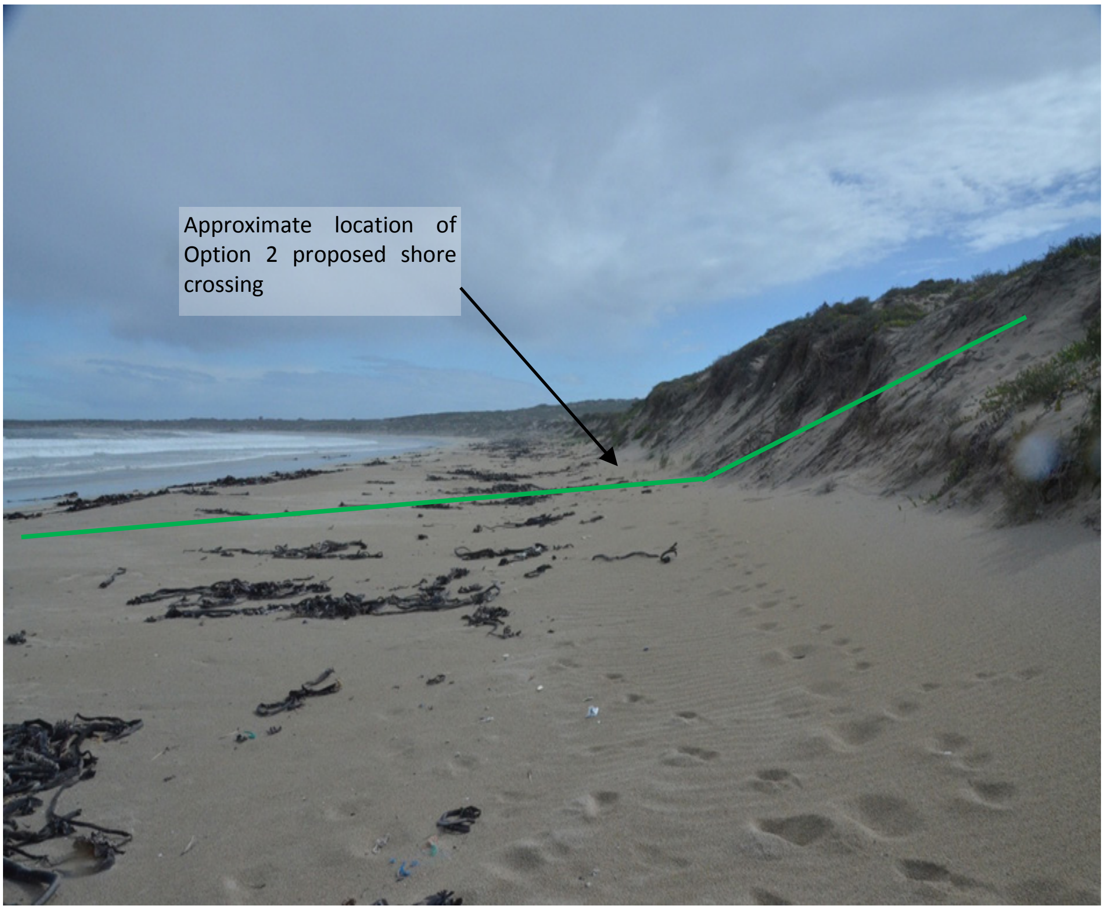


Figure 2.4b Marine outfall route: Option 2

Marine outfall route: Option 3

The connection point for the Option 3 route to the onshore pipeline is the same as for Option 1. The pipeline would follow a route west to enter the small rocky bay to the west of Danger Bay.

The principal philosophy behind the initial selection of this route as an option was:

- A route avoiding the desalination plant and associated pipelines would minimise the potential disruption to/from the desalination plant construction; and
- Discharging the effluent into a separate bay would avoid any potential recirculation issues for the desalination plant intake.

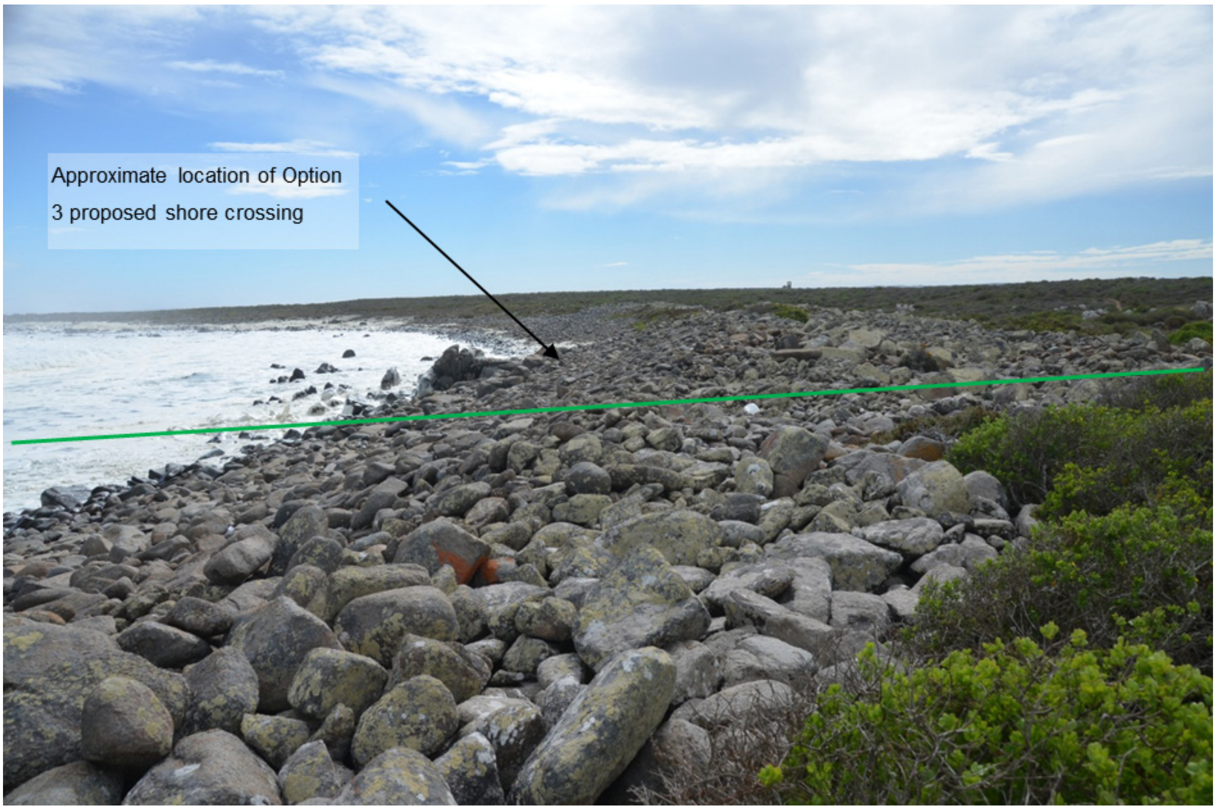


Figure 2.4c Marine outfall route: Option 3

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

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

In general, WorleyParsons expect effective dispersion of the effluent from Option 1 and Option 2. At this stage it is assumed that the outfall will need to be located at -10m Chart Datum to allow adequate dispersion of the effluent. Furthermore, they have assumed that the pipeline may need to head towards the southeast to discharge into a slightly less sheltered area. The shore crossing (the most vulnerable part of the pipeline) is in a relatively sheltered location.

Previous analysis of the shoreline stability in Danger Bay indicates a reasonably stable shoreline. Therefore it is not expected that the pipeline will be particularly vulnerable to exposure due to long-term coastal erosion and the pipeline should be relatively well protected in the event of major storms in excess of the design storm event. The appropriate method for erosion protection for the pipeline will be determined during the preliminary design phase.

2.4 ASSOCIATED INFRASTRUCTURE OF PROPOSED SRMO PIPELINE

2.4.1 Effluent storage tanks

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

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

Effluent will be transferred from each independent facility to the SRMO pipeline infrastructure via pumps (see Figure 2.1 and 2.5). Online quality control instruments will be used to continuously monitor the quality of each facility's effluent and although no radioactive materials will be processed at the SSP (refer to section 2.4.7.1) as a final precaution an continuous radio activity detector would be installed on the SSP effluent feed lines to the SRMO system as a precautionary measure. If the effluent of a particular facility/ies does not meet the required quality standards and requirements an automated valve will close to prevent the effluent from entering the SRMO transfer tank (15 m^3) (see Figure 2.5). Effluent that does not comply with the relevant standards will therefore not be pumped and disposed of at Danger Bay. It is therefore crucial that each facility that intends to use the SRMO pipeline must have its own effluent storage tank on site to ensure that it will be able to store effluent that is non-compliant.

In addition to continuous monitoring, samplers will be set to collect liquid samples automatically at regular timed intervals to produce a daily composite for off-site laboratory analysis to ensure compliance of specified marine disposal requirements.

The effluent quality will be continuously monitored online for constituents that the Marine Ecology study ((Appendix A of Volume II of this report) determines detrimental to the environment including:

- pH;
- Conductivity;
- Turbidity;
- Oxidation reduction potential (as a surrogate for oxidising biocides); and
- Temperature.

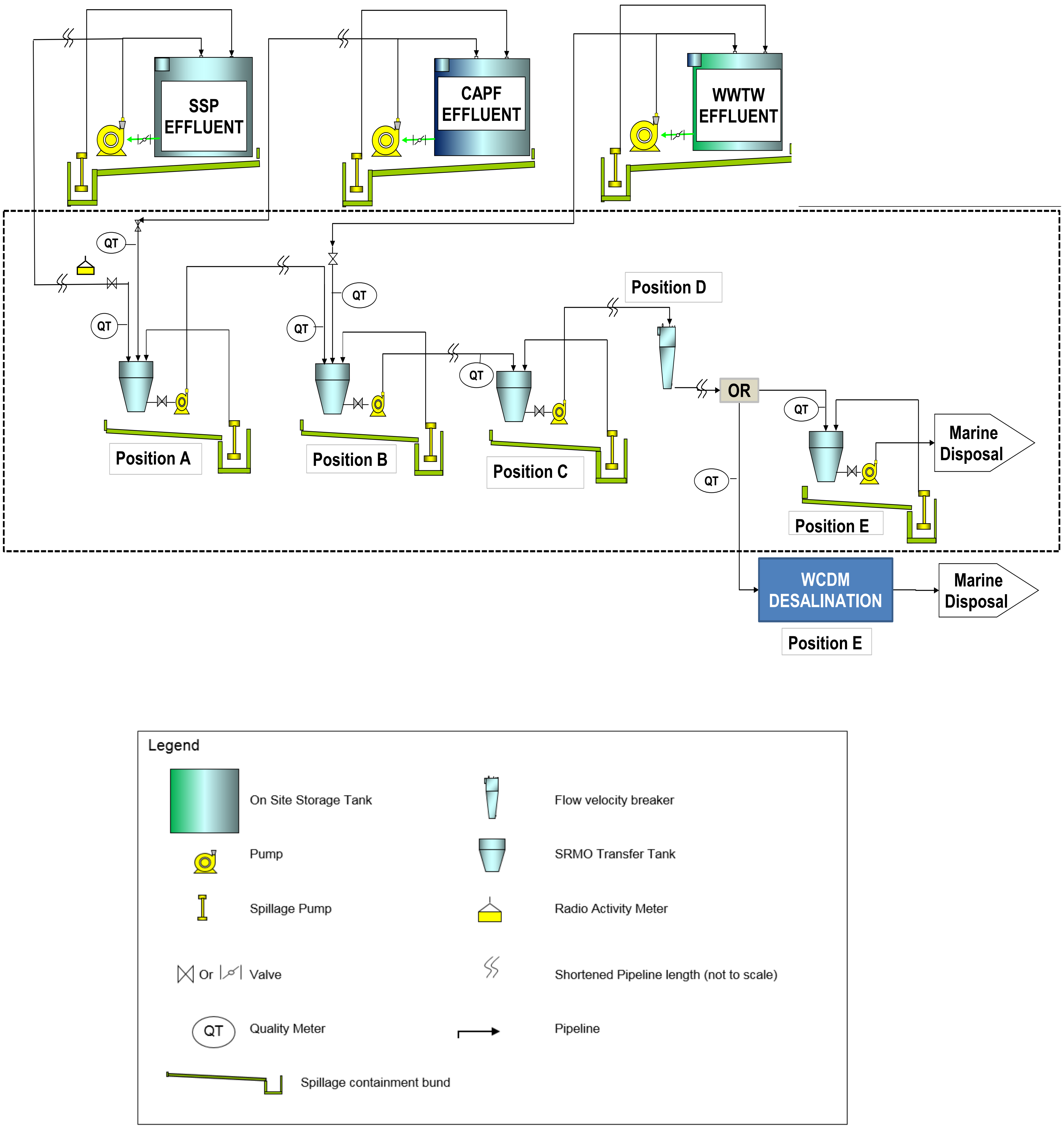


Figure 2.5 Flow Diagram of effluent streams from the proposed Saldanha Separation Plant, Chlor Alkali Production Facility and the regional Waste Water Treatment Works to the marine disposal point.

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 2.6). 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.

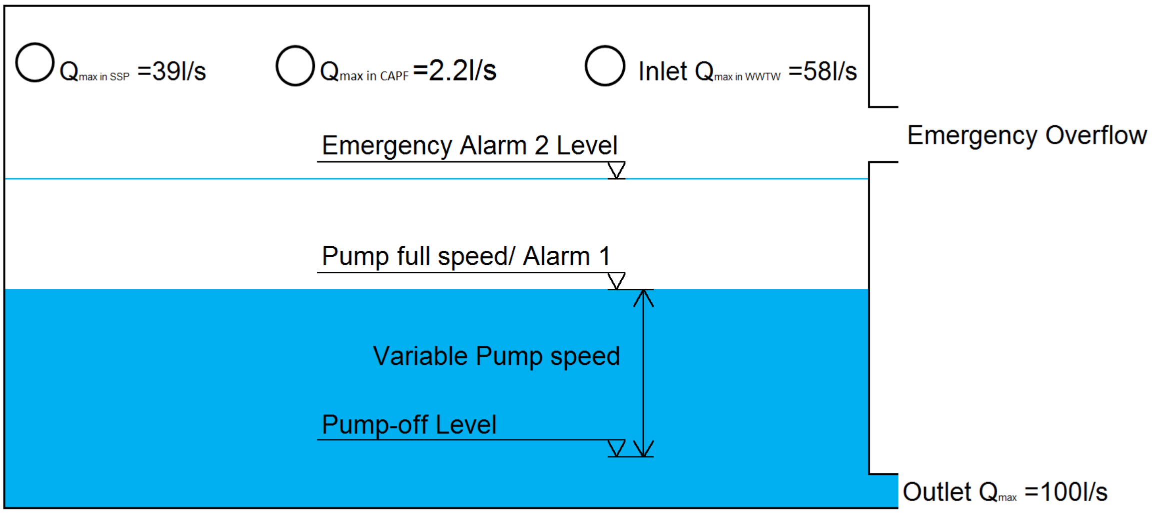


Figure 2.6 Transfer tank level indicators for Design Philosophy

2.4.2 Pump stations

Five pump stations with associated transfer tanks are proposed along the pipeline corridor (marked A to E in Figure 2.2). These structures will not be taller than 5 m. Figure 2. 7 and Figure 2. 8 show examples of pump stations and associated transfer tanks. Please refer to Appendix B9 of Volume I of the FEIAR for the proposed layout and dimensions of a pump station and transfer tank.

The following design parameters apply to the pump stations:

- the transfer pump stations will be located within (or as close as possible) to the servitude or it will be located on a separate site that may require rezoning;
- the access roads will be 5 m wide and not more than 100 long, with turning radii of to allow maintenance vehicles entry and exit;
- the pump stations will be fenced off with double swing gates for access control;
- the pump station will comprise of a concrete building;
- the pump stations will be remotely monitored and controlled via a centralized off site control room;
- security measures (*e.g.* burglar proofing) will be installed to secure the pump station and a concrete roof will be constructed; and
- a bunded storage facility will be provided and designed to accommodate the industrial effluent requirements (since separate EIAs will have to be performed each time a new industry utilises the facility, the EIA requirement may prescribe to update the Engineering Design during which time the size of the bunded area may change).

Figure 2.7 An example of a pump station building (*Source*: Huffcutt)

Figure 2.8 Transfer tank of similar size to those proposed for the SRMO Project. (*Source*: H2L group)

Each pump station site will be investigated with regard to access and storm water management to ensure minimal impact on the environment. Access to the pump stations will be taken from secondary existing access road and where this is not possible, access will be taken directly from the provincial road TR85 (Figures 2.9 (i)-(iv). The necessary way leaves and approvals will be applied for from the relevant Provincial Roads Department. It is anticipated that the access roads will be gravel roads with concrete edgings with sufficient turning radii to allow maintenance vehicles easy entry and exit from the pump station.

The pump station located at Position A will share an access road with the SSP.

The pump station located at Position B will share an existing access directly of the TR85 with the proposed regional WWTW.

Figure 2.9 (i) Access road to Pump station B utilising existing access from TR85

The pump station located at Position C will get access off the existing secondary access road linking the TR85 with the Witpilaar Rail Station access road.

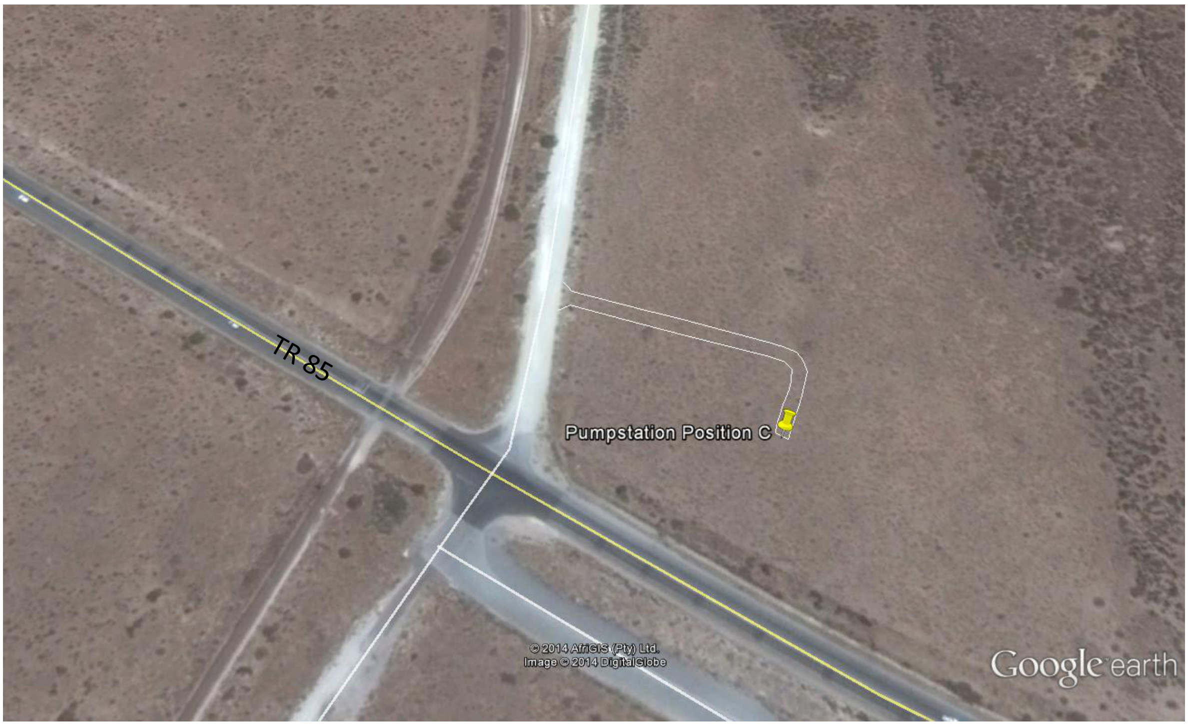


Figure 2.9 (ii) Access road to Pump station C utilising existing minor road

It is anticipated that the pump station located at Position D will share an access with the existing Vodacom substation.

Figure 2.9 (iii) Access road to Pump station D via existing access road

The pump station located at Position E will share an access with the desalination plant and current existing roads in the area.

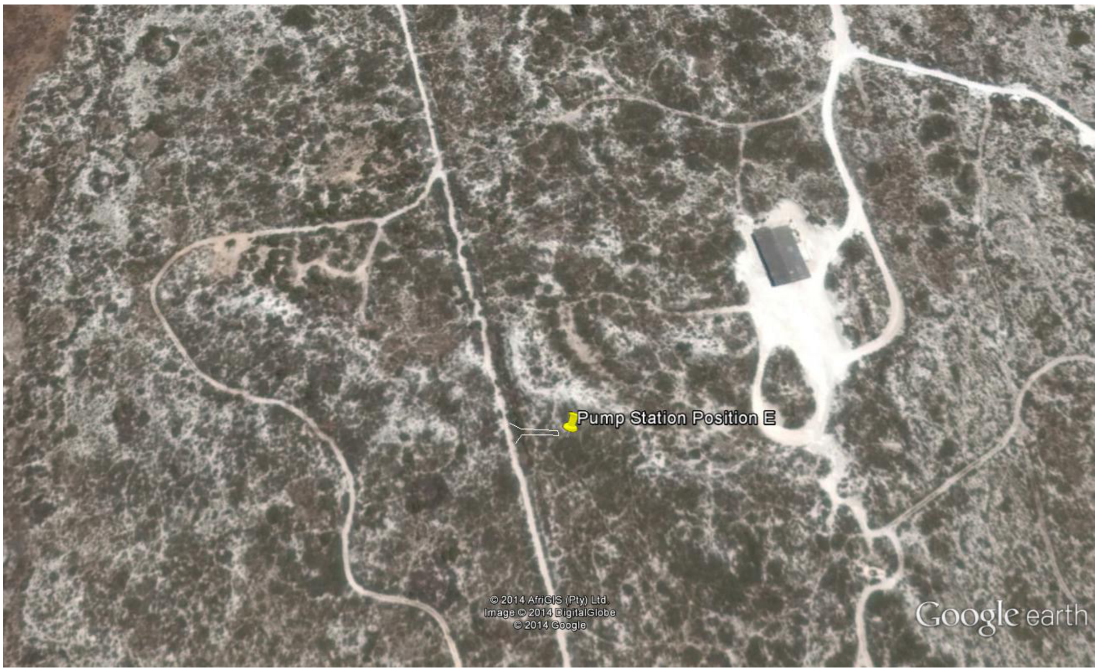


Figure 2.9 (iv) Access road to Pump station E

2.4.3 Pump station transfer tanks

The pump station transfer tanks (comprising a volume of 15 m^3 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. 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) (600 litre capacity) 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.

2.4.4 Auxiliary equipment

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

2.4.5 Electrical supply and infrastructure

This section describes the electrical supply and requirements of the pump stations associated with the SRMO Project. It is estimated that each transfer pump station will require 315 kVA. Figure 2.10 shows the positions of the power lines that will be constructed as part of the SRMO Project.

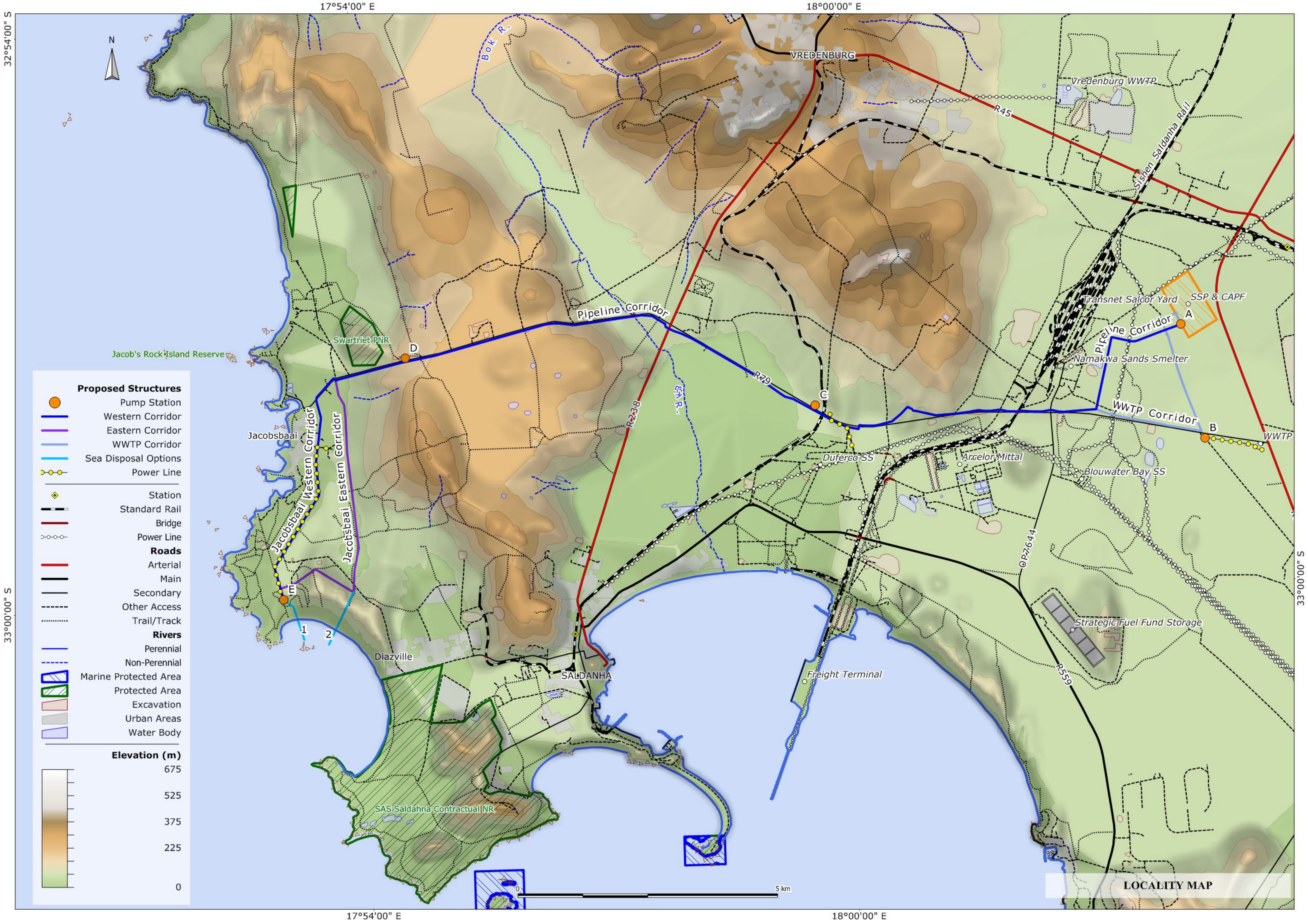


Figure 2.10 Locations of the proposed power lines that will be constructed as part of the SRMO Project

2.4.5.1 Bulk electrical supply

RHDHV investigated the supply of bulk electrical services to the different pump stations located at various positions along the proposed pipeline route. Due to the different transfer pump stations locations, electricity will be supplied by either Eskom or the SBM.

Eskom will provide electricity to the pump station at Position A and B (see letter from Eskom in Appendix B4). The SBM will provide electricity to the other three pump stations, *i.e.* at Positions C, D and E.

There are two options to supply electricity to the pump stations, i.e. via Medium Voltage (MV) underground cabling or MV Overhead lines (OHL). All designs and installations need to comply with the specifications of the relevant electricity provider.

The section will discuss the proposed methods of electricity supply.

2.4.5.1.1 Position A

Since the transfer pump station is located in the vicinity of the SSP and the CAPF, power at 11kV would be supplied from either the SSP or the CAPF to the SRMO transfer pump station at Position A via either MV cabling or MV Overhead Lines.

2.4.5.1.2 Position B

The 11 kV OHL Langebaan Feeder No 2 is located approximately 1.6 km from Position B and is operated by Eskom. Eskom confirmed that the Langebaan Feeder No 2 has the capacity to supply electricity to the pump station. There is a possibility to implement an overhead line or a MV cabling system to supply electricity to the pump station at Position B.

Option 1 – Medium Voltage cabling: The MV cable option will allow a portion of the cable to run along the pipeline and will be buried, depending on the width of the pipeline servitude. The second section of the cable will run along the road where a road crossing will be required. Wayleave approvals (approval from authorities to construct in their existing servitudes) will be required for the installation of the cable at Position B.

Option 2 - Medium Voltage Overhead Lines:
The alternative to the MV underground cable is an OHL from the point of supply at the Langebaan Feeder No 2 (Eskom Feeder). The OHL will need to be extended from the Langebaan Feeder No 2 to Position B. The proposed OHL will be subject to the relevant servitude approvals and the outcomes of the EIA process.

2.4.5.1.3 Position C

The proposed pump station at Position C is in close proximity to the following potential three Eskom connection points:

- 11 kV OHL Transnet Feeder
- 66 kV Duferco Substation
- 66 kV OHL Duferco Feeder.

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 B5). The point of supply is located approximately 500 m from the proposed Position C.

The installation of an OHL to the proposed pump station at Position C will be problematic as the Duferco 66 kV power line runs in close proximity to the pump station at Position C and these lines will need to be crossed. Due to the short distance and the crossing of the 66 kV Duferco feeder, the overhead line option will not be considered to supply electricity to the pump station at Position C.

Option 1 - Medium Voltage cabling: The MV cable will be installed from the 11 kV Transnet feeder. The cable route will require various servitude and wayleave approvals as the new supply cable will need to cross servitudes that belong to various other parties.

2.4.5.1.4 Position D

The proposed pump station at Position D is at close proximity to the 11 kV Jacobs Bay feeder, operated by the SBM. The Jacobs Bay feeder is approximately 400 m from the proposed pump station at Position D and due to the short distance, the installation of an underground MV cable is recommended.

Option 1 - Medium Voltage cabling: The MV cable will be installed from the 11 kV Jacobs Bay feeder. The cable route will require wayleave approvals, as the new supply cable will need to cross some existing roads and possible underground services.

2.4.5.1.5 Position E

The proposed pump station at position E is in close proximity to the following two potential connection points of the SBM:

- 11 kV OHL Jacobs Bay Feeder
- 11 kV Diazille area supply.

The 11 kV Diazille area supply is not recommended for any additional loading as it was reported by the SBM that the line is experiencing voltage regulation problems. The SBM recommends that the 11 kV Jacobs Bay feeder be utilised for the new pump station at Position E.

The Jacobs Bay feeder is located approximately 4 km from the proposed pump station at Position E. An overhead line or underground cable system can be installed to supply electricity to Position E.

Option 1 - Medium Voltage cabling: The MV cable will to a large extent follow the pipeline route. This will require the widening of the servitude. Initial geotechnical investigations reported that the soil conditions are not favourable due the rocky nature of the terrain, which will cause excessive excavation rates, consequently the MV underground cable option will not be feasible.

Option 2 - Medium Voltage Overhead Lines: The alternative to the MV underground cable is an overhead line from the supplier point at the 11 kV Jacobs Bay feeder. The route for the overhead line will follow the pipeline and some further studies will be required to assess the servitude requirements for the pipeline and overhead line system.

2.4.5.1.6 Miniature Substation

A miniature substation (minisub) will be provided at each of the proposed pump stations. The minisub will comply with the following parameters as specified in Table 2.1:

Table 2.1 Miniature Substation Parameters

PRIMARY VOLTAGE	11 KV
No-Load Secondary Voltage	420 V
System Voltage (Motor and Pump sets)	400 V
Rated Power	315 kVA
Frequency	50 Hz
Vector Group	Dyn 11

2.4.5.2 Medium Voltage Overhead Lines, Cables and LV Power Cables

The details of the MV overhead lines and MV underground cables that will feed the respective pump stations are discussed below.

2.4.5.2.1 Medium Voltage Overhead Lines

The overhead lines structures and conductors will be in accordance with the electricity provider's standards. The parameters will be as follow:

Table 2.2 Overhead Lines Structures and Conductors Parameters

STRUCTURE GEOMETRY	DELTA A-FRAME
Material	Wooden pole
Pole Height	12 m
Outer phases Height	9 m
Centre phases Height	10 m
Phases offset from centre	0.6 m
Depth of burial	1.8 m
Conductor	Fox

Figure 2.11 below represents the typical geometry of an overhead line.

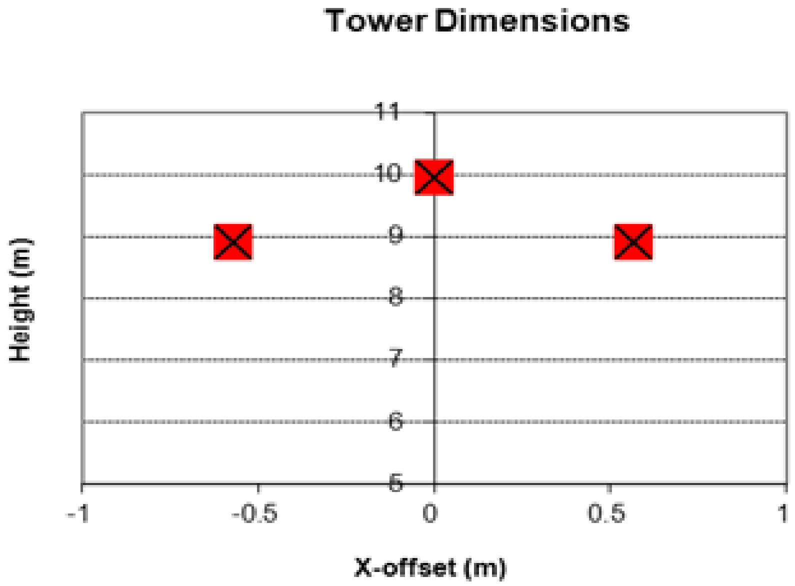


Figure 2.11 Typical Geometry of an Overhead Power line

2.4.5.2.2 Installation of Medium Voltage Overhead Lines

The installation of the overhead lines will be dependent on the various wayleave approvals, outcomes of the EIA processes and the relevant electricity suppliers.

2.4.5.2.3 Medium Voltage Cables

Medium voltage cables will be in accordance with the relevant electricity provider's standards. All MV underground cables will be supplied by the relevant electricity provider.

2.4.5.2.4 Installation of Medium Voltage Cables

Medium voltage cables will only be installed where the pump station positions are in close proximity of the supply point or where an overhead line is not practically possible.

All MV underground cables will be supplied and installed by the relevant electricity provider.

2.4.6 Effluent flows

A hydrodynamic marine dispersion modelling study was undertaken by WorleyParsons as part of the EIA to model the rates of effluent dispersion in Danger Bay originating from the combination of effluent streams from the separate industries listed below (Annexure 2 of Volume III). The SRMO Project will discharge approximately 8 - 9 Mega litres per day (Mℓ/day) of treated effluent:

- Effluent discharge from the proposed Frontier Separation SSP, located on Portion 6 of the Farm Uiekraal (effluent discharge of 3.4 Mℓ /day);
- Effluent discharge from the proposed new Chlor-Alkali process plant operated by CAH (190 kℓ /day) located adjacent to the Frontier Separation SSP on the same property; and
- Effluent discharge from a proposed WWTW for the region (5 Mℓ/day discharge) that is located on a different property than the SSP and CAPF.

Note: The EIA will exclude the transfer and disposal of effluent by future operations (other than those referred to above) since the quantities and constituents of such effluent streams are not available at this stage. Should other operations or projects require the use of the proposed effluent transfer system, the appropriate authorisations, permits or amendments will have to be obtained by the relevant project proponents.

The anticipated flow rates (as designed for by RHDHV in the pre-feasibility study) for each of the three effluent streams mentioned above are listed in Table 2.3:

Table 2.3 Anticipated Design flow rates from proposed effluent streams

PROPOSED EFFLUENT STREAM *	RHDHV PREFEASIBILITY DESIGN			
		UNITS		UNITS
Saldanha Separation Plant	38.9	l/s	3.4	Ml/day
Chlor Alkali Production Facility	2.2	l/s	0.2	Ml/day
Regional Waste Water Treatment Works	57.9	l/s	5.0	Ml/day
Other Industries	0	l/s	0	Ml/day
Total Flow rate	**98.94**	**l/s**	**8.55**	**Ml/day**
*this excludes the effluent from the proposed West Coast District Municipality Desalination plant. However, this was modelled as part of the overall EIA.				

For completeness of the marine dispersion modelling and Marine Ecology assessment five different variations of modelling parameters were investigated to determine the cumulative or solitary impact if alternative combinations of contributers dispose effluent via the SRMO Project.

The five Marine Modelling scenarios investigated include:

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

A summary of these modelling scenarios modelled and used in the Marine Ecological assessment are presented in Table 2.4.

Table 2.4 The discharge combinations simulated in the hydrodynamic and water quality modelling study.

Modeling Scenario	Process Description	Discharge (Ml/d)	Salinity (PSU)	Temperature (°C)	Outfall Position
1	SSP	3.36	104.35	20.0	Option 1 & 2
2	SSP + CAPF	3.55	102.16	20.0	Option 1 & 2
3	SSP + CAPF + WWTW	8.55	42.44	20.0	Option 1 & 2
4	SSP + CAPF + WCDM DP	41.95	64.00	17.3	WCDM Brine Return
5	SSP + CAPF + WWTW + WCDM DP	46.95	57.20	17.5	WCDM Brine Return

2.4.7 Composition of effluent stream

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

2.4.7.1 Proposed Saldanha Separation Plant

The anticipated composition of the effluent generated by the proposed SSP is contained in Table 2.5.

Table 2.5 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°C			
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 EA 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 receive 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.

2.4.7.2 Chlor-Alkali Production Facility

The anticipated composition of the effluent generated by the proposed CAPF is contained in Table 2.6.

Table 2.6 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

2.4.7.3 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 2.7.

Table 2.7 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 Nitrogen	mg/l	6
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

2.5 PROPOSED SERVITUDES AND WAYLEAVE APPLICATIONS

2.5.1 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.

2.5.2 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.

2.6 DECOMMISSIONING PHASE

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 (either Option 1 or 2 outfall locations) 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).

All requirements of the Environmental Management Programme (EMP) and EIA regarding the rehabilitation and restoration of terrestrial and/or marine ecosystems will need to be undertaken after the SRMO Project has been decommissioned.