

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 4: NATIONAL AND INTERNATIONAL LEGISLATION



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4 APPROACH TO EIA, LEGISLATION, AND PUBLIC CONSULTATION

This chapter outlines the legal context and guidelines that apply to the proposed SRMO Project.

4.1 LEGISLATION, EIA GUIDELINES AND INTERNATIONAL CONVENTIONS

This section provides an overview of legislation, guidelines and information documents that have informed the scope and content of this Report and the approach to the EIA process.

4.1.1 National Legislation

4.1.1.1 The Constitution (Act 108 of 1996)

The Constitution which is the supreme law of the Republic of South Africa provides the legal framework for legislation regulating environmental management in general, against the backdrop of the fundamental human rights enshrined in that statute.

The most pertinent fundamental right in the context of coastal management is the environmental right (reflected in Section 24), which provides 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 through reasonable legislative and other measures that –
 - prevent pollution and ecological degradation;
 - promote conservation; and
 - secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

Section 24 of the Bill of Rights therefore guarantees the people of South Africa the right to an environment that is not detrimental to human health or well-being, and specifically imposes a duty on the State to promulgate legislation and take other steps that ensure that the right is upheld and that, among other things, ecological degradation and pollution are prevented.

The Constitution emphasises co-operative governance and provides the legal basis for allocating powers to different spheres of government. Schedule 4 (titled "Functional areas of concurrent national and provincial legislative competence") and Schedule 5

(titled “Functional areas of exclusive provincial legislative competence”) to the Constitution list the areas within which the tiers of national, provincial (Part A of the Schedule) and local (Part B of the Schedule) government have legislative mandates. In instances where provincial or local legislation are in conflict with national legislation, national legislation prevails.

4.1.1.2 National Environmental Management Act (Act 107 of 1998) (NEMA)

The National Environmental Management Act (Act 107 of 1998) (NEMA) provides for co-operative environmental governance through the establishment of national environmental management principles, and procedures for their incorporation into decisions affecting the environment. NEMA emphasises co-operative governance and assists in ensuring that the environmental right and related rights in the Constitution are protected. NEMA requires the Department of Environmental Affairs to be the lead agent in ensuring the effective custodianship of the environment.

In particular, the Act provides that sensitive, vulnerable, highly dynamic or stressed ecosystems require specific attention in management and planning procedures, especially where subjected to significant human resource usage and development.

NEMA sets out a range of national environmental management principles. These NEMA Principles and the principles of sustainable development were applied to the SRMO Project as can be seen in Table 4.1 below.

Table 4.1 The NEMA principles relevant to the SRMO Project and how it was addressed in the EIA.

NEMA Principle (Section 2 of Act 107 of 1998)	Relevant project objective	Compliance with NEMA Principles
Section 2 (2): Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.	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 <i>“Amendment to the Broad-Based Socio-Economic Empowerment Charter for the South African Mining Industry”</i> (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 Rare Earth Elements (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). 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 Saldanha Separation Plant (SSP) and the Chor-Alkali Holding (CAH) plants at Saldanha Bay.	Should the project proceed; the welfare of the affected people and their relevant needs will be prioritised through job creation and revenue generation at a local and national level. Job creation could add to the maintenance and growth of physical, psychological, developmental, cultural and social interests of the effected communities.
Section 2 (3): Development must be socially, environmentally and economically sustainable.		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 Utilities has identified a source of rare earths within South Africa and is developing the SSP and associated facilities near Saldanha Bay in order to meet the global need for these minerals. Accordingly, the economic and social sustainability of the proposed project is not only proven by a 64 year history, but is also likely to expand given the contraction of the Chinese market for rare earth metals. This EIA process found no environmental “fatal flaws” resulting from the

NEMA Principle (Section 2 of Act 107 of 1998)	Relevant project objective	Compliance with NEMA Principles
		proposed project and identified relevant mitigation measures to mitigate potential impacts to acceptable levels. As such, the proposed project appears to be environmentally sustainable.
Section 2 (4)(a): Sustainable development requires the consideration of all relevant factors including the following:		
i. That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the “EIA Regulations” (GN No. R. 543, June 2010). Section 31 (l) of the EIA Regulations requires the assessment of all potentially significant impacts. Such a potentially significant impact investigated during this EIA process includes impacts on terrestrial ecology (Terrestrial Ecology specialist study in Appendix B of Volume II).	Chapter 8, section 8.2 of this EIA Report contains a summary of the terrestrial ecological impacts likely to result from the proposed project and proposes relevant actions to avoid such impacts, or where it cannot be avoided, suggests relevant mitigation measures to minimise its impact. The Terrestrial Ecology specialist study is included as Appendix B of Volume II.
ii. that pollution and degradation of the environment are avoided, or where they cannot be altogether avoided, are minimised and remedied;	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the “EIA Regulations” (GN No. R. 543, June 2010). Section 31 (l) of the EIA Regulations requires the assessment of all potentially significant impacts. Such a potentially significant impact investigated during this EIA process includes impacts on Marine Ecology (see Marine Ecology Specialist study included in Appendix A of Volume II of this report).	Appendix A of Volume II of this EIA Report contains the Marine Ecology specialist study which investigates the potential impacts likely to result from the proposed project and proposes relevant actions to avoid such impacts, or where it cannot be avoided, suggests relevant mitigation measures to minimise its impact.
iii. that the disturbance of landscapes and sites that constitute the nation’s cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the “EIA Regulations” (GN No. R. 543, June 2010). Section 31 (l) of the EIA Regulations requires the assessment of all potentially significant impacts. Such a potentially	Chapter 8, section 8.2 of this EIA Report contains the visual and heritage specialist studies which investigates the potential impacts likely to result from the proposed project and proposes relevant actions to avoid such impacts, or where it cannot be avoided, suggests relevant

NEMA Principle (Section 2 of Act 107 of 1998)	Relevant project objective	Compliance with NEMA Principles
	significant impact investigated during this EIA process includes visual and heritage impacts (including Palaeontology and Archaeology). These studies are included in Appendix D (Visual) and Appendix E (Heritage) in Volume II of this report.	mitigation measures to minimise its impact. These studies are included as Appendix D (Visual) and Appendix E (Heritage) in Volume II of this report.
iv. that waste is avoided, or where it cannot be altogether avoided, minimised and reused or recycled where possible and otherwise disposed of in a responsible manner;	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the “EIA Regulations” (GN No. R. 543, June 2010). Section 31 (l) of the EIA Regulations requires the assessment of all potentially significant impacts.	The Draft EMP contained in Section B of Volume I contains measures to avoid waste generation or to dispose of it in a responsible manner.
v. that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the “EIA Regulations” (GN No. R. 543, June 2010). Section 31 (l) of the EIA Regulations requires the assessment of all potentially significant impacts.	Non-renewable natural resources will not be depleted by the proposed SRMO Project.
vi. that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised;	N/A	N/A
vii. that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the “EIA Regulations” (GN No. R. 543, June 2010). Section 31 (l) of the EIA Regulations requires the assessment of all potentially significant impacts.	All specialists included a section on assumption and limitations in their specialist studies. Specialists also applied a risk-averse approach in their studies (Appendices A-F of Volume II of this report).
viii. that negative impacts on the environment and on people’s environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the “EIA Regulations” (GN No. R. 543, June 2010). Section 31 (l) of the EIA Regulations requires the assessment of all	The range of specialist studies commissioned for this EIA aimed to identify potential negative impacts on people’s environmental rights, to avoid such impacts where possible, and to minimise such impacts where it cannot

NEMA Principle (Section 2 of Act 107 of 1998)	Relevant project objective	Compliance with NEMA Principles
minimised and remedied.	potentially significant impacts.	be altogether prevented (Appendices A-F of Volume II of this report).
Section 4 (b): Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the “EIA Regulations” (GN No. R. 543, June 2010). Section 31 (l)(i) of the EIA Regulations requires the assessment of cumulative impacts.	The best environmental option or alternative were informed by the specialist studies that were undertaken as part of the EIA process. The specialist studies deal with the cumulative impacts expected to result from the proposed project (Appendices A-F of Volume II of this report).
Section 4 (c): Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the “EIA Regulations” (GN No. R. 543, June 2010). Chapter 6 of the EIA Regulations requires rigorous public participation in order to ensure the rights of all effected parties are considered and to avoid discrimination.	Chapter 5, section 5.3 of this EIA Report explains the public participation process followed during this EIA process. The purpose and aim of this process is to ensure transparency and to avoid any form of discrimination, both in terms of ability to participate in decision-making, and in terms of distribution characteristics of project impacts. The potential negative impacts were assessed in the specialist studies contained in Appendices A-F in Volume II of this FEIAR.
Section 4 (d): Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination.	N/A	N/A

NEMA Principle (Section 2 of Act 107 of 1998)	Relevant project objective	Compliance with NEMA Principles
Section 4 (e): Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the "EIA Regulations" (GN No. R. 543, June 2010). Section 33 (a) through (k) of the EIA regulations stipulate the contents of the Draft Environmental Management Programme (Draft EMP). The purpose of the Draft EMP is to ensure that adequate management actions and required mitigation measures are implemented throughout the life cycle of the proposed project. This also requires the identification of liable parties/individuals for both implementation and legal accountability purposes.	Section B of Volume I of this EIA Report contains the Draft EMP for the proposed development and clearly ascribes responsibility for the environmental health and safety consequences of the proposed project. It also lists monitoring requirements to reduce or avoid environmental impacts.
Section 4 (f): The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured.	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the "EIA Regulations" (GN No. R. 543, June 2010). Chapter 6 of the EIA Regulations requires rigorous public participation in order to ensure the rights of all effected parties are considered and to avoid discrimination.	Chapter 5, section 5.3 of this EIA Report explains the Public Participation Process followed during this EIA process. Chapter 7, section 7.3, explains the Public Participation Process followed following the release of the Draft EIR.
Section 4 (g): Decisions must take into account the interests, needs and values of all interested and affected parties, and this includes recognising all forms of knowledge, including traditional and ordinary knowledge.	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the "EIA Regulations" (GN No. R. 543, June 2010). Chapter 6 of the EIA Regulations requires rigorous public participation in order to ensure the rights of all effected parties are considered and to avoid discrimination.	Chapter 5, section 5.3 of this EIA Report explains the Public Participation Process followed during the Scoping process. Chapter 7, section 7.3 of this EIA Report explains the Public Participation Process followed during the EIA process. The Comments & Responses Chapter of this EIA Report (Chapter 6) further illustrates the consideration of interests, needs and values of relevant interested and affected parties.

NEMA Principle (Section 2 of Act 107 of 1998)	Relevant project objective	Compliance with NEMA Principles
Section 4 (h): Community wellbeing and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the “EIA Regulations” (GN No. R. 543, June 2010). Chapter 6 of the EIA Regulations requires rigorous public participation in order to ensure the rights of all effected parties are considered and to avoid discrimination.	As part of the public participation component of this EIA several Focus Group Meetings were held with members of the community and two Public Open House Meetings were held on 30 October 2013 and 13 November 2014 in Saldanha Bay. The attendance registers and notes of the Public Open House Meetings and the Focus Group Meetings are provided in Appendix H and I respectively. The purpose of these meetings was not only to share project related information, but also to educate the community regarding the basic environmental processes present in the study area and how the proposed project might impact on these processes.
Section 4 (i): The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the “EIA Regulations” (GN No. R. 543, June 2010). Section 31 (l) of the EIA Regulations requires the assessment of all potentially significant impacts. One such potentially significant impact investigated during this EIA process is the disruption or change of the socio-economic environment.	Appendix F of Volume II of this EIA Report contains the Economics specialist study which investigates the potential socio-economic impacts likely to result from the proposed project.
Section 4 (j): The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the “EIA Regulations” (GN No. R. 543, June 2010). Section 33 (a) through (k) of the EIA regulations stipulate the contents of the Draft EMP. The purpose of the EMP is to ensure that adequate management actions and required mitigation measures are implemented throughout the life	Section B of Volume I of this EIA Report contains the Draft EMP for the proposed development. Part of the management actions contained in the EMP deals with health and safety management guidelines and principles relevant to workers.

NEMA Principle (Section 2 of Act 107 of 1998)	Relevant project objective	Compliance with NEMA Principles
	cycle of the proposed project.	
Section 4 (k): Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the “EIA Regulations” (GN No. R. 543, June 2010). Chapter 6 of the EIA Regulations requires rigorous public participation in order to ensure the rights of all effected parties are considered and to avoid discrimination.	Chapter 5, section 5.3 of this EIA Report explains the Public Participation Process followed during the scoping process. Chapter 7 (section 7.3) explains the Public Participation process that was followed after the release of the Draft EIR. The Comments & Responses Chapter of this EIA Report (Chapter 6) further illustrates that decisions were made in an open and transparent manner.
Section 4 (l): There must be intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment.	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the “EIA Regulations” (GN No. R. 543, June 2010). Section 54 (2)(b)(iv)(v) and (vi) requires the public participation process relevant to the EIA to communicate the project details and solicit comments from the: (1) affected local government, (2) any organ of state having jurisdiction in respect of any activity, and (3) any other party as required by the competent authority.	Chapter 5, section 5.3 of this EIA Report explains the Public Participation Process followed during this EIA process. As part of this process, various organs of state were contacted, as well as the affected local government; with the aim of facilitation intergovernmental coordination and harmonisation. Focus Group Meetings were undertaken with various authorities (see Appendix I of Volume I). The Public Participation Process that was followed is explained in Chapter 5 and 7 of the FEIAR.
Section 4 (m): Actual or potential conflicts of interest between organs of state should be resolved through conflict resolution procedures.	N/A	N/A

NEMA Principle (Section 2 of Act 107 of 1998)	Relevant project objective	Compliance with NEMA Principles
Section 4 (n): Global and international responsibilities relating to the environment must be discharged in the national interest.	N/A	N/A
Section 4 (o): The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the "EIA Regulations" (GN No. R. 543, June 2010). Section 31 (l) of the EIA Regulations requires the assessment of all potentially significant impacts.	The range of specialist studies commissioned for this EIA aimed to identify potential negative impacts on people's environmental rights, to avoid such impacts where possible, and to minimise such impacts where it cannot be altogether prevented. The specialist studies that were undertaken include Marine Ecology, Terrestrial Ecology, Wetlands, Visual, Heritage and Economics. These studies are contained as Appendices A-F respectively in Volume II of this FEIAR.
Section 4 (p): The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the "EIA Regulations" (GN No. R. 543, June 2010). Section 33 (a) through (k) of the EIA regulations stipulate the contents of the Draft Environmental Management Program (Draft EMP). The purpose of the Draft EMP is to ensure that adequate management actions and required mitigation measures are implemented throughout the life cycle of the proposed project. This also requires the identification of liable parties/individuals for both implementation and legal accountability purposes. The EMP also includes monitoring requirements to ensure that environmental impacts are minimised or prevented.	Section B of Volume I of this EIA Report contains the Draft EMP for the proposed development and clearly ascribes responsibility for the environmental health and safety consequences of the proposed project.

NEMA Principle (Section 2 of Act 107 of 1998)	Relevant project objective	Compliance with NEMA Principles
Section 4 (q): The vital role of women and youth in environmental management and development must be recognised and their full participation therein must be promoted.	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the “EIA Regulations” (GN No. R. 543, June 2010). Chapter 6 of the EIA Regulations requires rigorous public participation in order to ensure the rights of all effected parties are considered and to avoid discrimination.	Chapter 5 (section 5.3) of this EIA Report explains the Public Participation Process followed during this EIA process. Every effort was made to solicit the participation of all groups in the environmental management process of this EIA.
Section 4 (r): Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.	Frontier Utilities submitted an Application for Environmental Authorisation as per the requirements of the “EIA Regulations” (GN No. R. 543, June 2010). Section 31 (l) of the EIA Regulations requires the assessment of all potentially significant impacts. Such potentially significant impacts investigated during this EIA process include impacts on wetlands (Appendix C of Volume II). Mitigation measures to reduce impacts on coastal dunes are provided in the EMP (Section B of Volume I of this Draft EIA Report).	Chapter 8, section 8.3 of this EIA Report contains a summary of the impacts on wetlands that will result from the proposed project. The wetland specialist study is included in Appendix C of Volume II.

4.1.1.3 EIA Regulations published under Chapter 5 of the NEMA on 18 June 2010 (GN R543, GN R544, GN R545 and GN R546 in Government Gazette 33306)

In June 2010, the National Minister for Water and Environmental Affairs, promulgated the Environmental Impact Assessment (EIA) Regulations 2010 in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA"). Since this promulgation, further amendments had been incorporated in consideration of published Correction Notices (July and December 2010 respectively).

- EIA procedures (Government Notice No. R. 543);
- Listing Notice 1 (listing activities for which a Basic Assessment process must be conducted) (Government Notice No. R. 544);
- Listing Notice 2 (listing activities for which a Scoping/EIR process must be conducted) (Government Notice No. R. 545);
- Listing Notice 3 (listing activities and sensitive areas per province, for which a Basic Assessment process must be conducted) (Government Notice No. R. 546); and
- Environmental Management Framework regulations (Government Notice No. R. 547).

These regulations came into effect on 02 August 2010 (Government Notice No. R. 660, R. 661, R. 662, R. 663, R. 664 and R. 665 in Government Gazette No. 33411 of 02 August 2010). The EIA regulations 2010 replace the EIA regulations that were promulgated in 2006 and also introduce new provisions regarding environmental impact assessments as well as regulations regarding Environmental Management Frameworks (EMFs). The SRMO Project was undertaken in terms of the 2010 NEMA EIA Regulations.

The listed activities which are triggered under these regulations in GN R544, 545 and 546 are listed in Table 1.4 of Chapter 1. These listed activities require authorisation from the relevant authority, which in this instance is the DEA&DP.

On 4 December 2014, the National Minister of Environmental Affairs, promulgated the Environmental Impact Assessment (EIA) Regulations 2014 (Government Gazette No. 38282) in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA").

- Government Notice R. 982: Environmental Impact Assessment Regulations 2014;
- Government Notice R. 983: Listing Notice 1 (List of activities and competent authorities identified in terms of sections 24 (2) and 24 D);
- Government Notice R. 984: Listing Notice 2 (List of activities and competent authorities identified in terms of sections 24 (2) and 24 D); and
- Government Notice R. 985: Listing Notice 3 ((List of activities and competent authorities identified in terms of sections 24 (2) and 24 D).

In addition to the listed activities triggered under the 2010 NEMA EIA Regulations, additional activities are also triggered in terms of the NEMA EIA Regulations which were

promulgated on 4 December 2014. Table 1.5 in Chapter 1 contains a list of activities which are triggered under the new NEMA EIA Regulations of 2014. Table 1.5 also shows the corresponding activity under the 2010 NEMA EIA Regulations.

It should be noted that although the project was undertaken in terms of the 2010 NEMA EIA Regulations, the National Appeal Regulations which came into effect on 8 December 2014 apply to the project. In terms of these Appeal Regulations (Section 4(1) of Chapter 2), the appellant has 20 days to submit an appeal from:

- (a) the date that the notification of the decision for an application for an environmental authorisation or a waste management licence was sent to the registered interested and affected parties by the applicant; or
- (b) the date that the notification of the decision was sent to the applicant by the competent authority, issuing authority or licensing authority, in the case of decisions other than those referred to in paragraph (a).

4.1.1.4 NEMA: Biodiversity Act (NEMBA) (Act 10 of 2004)

The objective of the Biodiversity Act is to provide for the conservation of biological diversity, regulate the sustainable use of biological resources and to ensure a fair and equitable sharing of the benefits arising from the use of genetic resources. The Act states that the state is the custodian of South Africa's biological diversity and is committed to respect, protect, promote and fulfil the constitutional rights of its citizens. It also recognises that South Africa is party to, amongst others, the Convention on Biological Diversity, the Convention on Wetlands of International Importance especially Waterfowl Habitat (Ramsar Convention) and the Convention on Migratory Species (Bonn Convention).

4.1.1.5 NEMA: Off-Road Vehicle Regulations GN. Regulation 1399: Regulations for the control of Vehicles in the Coastal Zone

Regulation 6 makes provision for seven categories under which a permit must be applied for before driving on the coast. Driving on the coast as part of the construction and operation of the proposed SRMO Project is included in this list and authorisation from DEA&DP: Coastal Management Unit (CMU) must be obtained.

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

The sections of the ICM 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 is section 63 "Environmental authorisations for coastal activities" which deals with EIAs 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;*
- (f) 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”.

4.1.1.7 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) (Smith & Cullinan, 2000). This Act will govern leasing of land from the State over the shore (State owned land).

4.1.1.8 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.

4.1.1.9 Protected Areas Act (Act 57 of 2003)

The Protected Areas Act provides for: The protection and conservation of ecologically viable areas representative of South Africa’s biological diversity and its natural landscapes and seascapes; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas.

4.1.1.10 Marine Pollution (Control and Civil Liability) Act (Act 6 of 1981)

The Marine Pollution (Control and Civil Liability) Act provides for the protection of the marine environment from pollution by oil and other harmful substances; the prevention and combating of such pollution; and the determination of liability in certain respects for loss or damage caused by the discharge of oil from ships, tankers and offshore installations. It prohibits the discharge of oil from ships, tankers and offshore installations, but provides exemptions in the case of, for example, the oil being released as a result of damage and steps being taken as soon as practicable to stop or reduce the escape of oil. The Act provides reporting procedures for discharges of any harmful substance.

4.1.1.11 Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA)

The objectives of the CARA are to provide for the conservation of the natural agricultural resources of South Africa by: the maintenance of the production potential of land; the combating and prevention of erosion and weakening or destruction of the water sources; and the protection of the vegetation and the combating of weeds and invader plants.

4.1.1.12 Marine Living Resources Act (Act 18 of 1998) (MLRA)

The objectives and principles of the MLRA deal with the utilisation, conservation and management of marine living resources. Marine living resources include any aquatic plant or animal, whether piscine or not, and any mollusc, crustacean, coral, sponge, holothurian or other echinoderm, reptile and marine mammals and include their eggs, larvae and all juvenile stages, but does not include sea birds and seals.

This MLRA governs activities in fishing harbours, including harbour pollution. The Act also gives a mandate to the Minister to promulgate Regulations towards marine pollution. Orderly control and development of mariculture is also regulated under this Act (Sections 18 and 27).

4.1.1.13 Sea Birds and Seals Protection Act

This Act 46 of 1973 governs the protection and control of the capture, killing and products produced from seabirds and seals.

4.1.1.14 The National Heritage Resources Act (Act 25 of 1999) (NHRA)

The NHRA introduces an integrated and interactive system for the management of national heritage resources (which include landscapes and natural features of cultural significance). One of the important elements of the Act is that it provides the opportunity for communities to participate in the identification, conservation and management of cultural resources.

The Act requires that in areas where there has not yet been a systematic survey to identify conservation-worthy places, a permit is required to alter or demolish any structure older than 60 years. This will apply until a survey has been done and identified heritage resources are formally protected.

Anyone who intends to undertake a development must notify the heritage resources authority and if there is reason to believe that heritage resources will be affected, an impact assessment report must be compiled at the developer's cost. Thus developers will be able to proceed without uncertainty about whether work will have to be stopped if a heritage resource is discovered.

4.1.1.15 The National Water Act (Act 36 of 1998) (NWA)

One the important objectives of the NWA is to ensure protection of the aquatic ecosystems of South Africa's water resources, including estuaries. To be able to do this effectively, the NWA requires policies to be in place that provide guidance in developing resource quality objectives, i.e. specifying aspects such as freshwater inflow, water quality, habitat integrity, biotic composition and functioning requirements. Estuaries are classified as a water resource under the NWA.

Section 21 of this Act identifies certain land uses (e.g. activities resulting in stream-flow reduction such as afforestation and cultivation of crops), infrastructural developments (e.g. altering the bed, banks, course or characteristics of a watercourse), water supply/demand and waste disposal (from land-based activities) as 'water uses' that require authorisation (licensing) by the Department of Water Affairs and Sanitation (DWAS).

4.1.1.16 The Water Services Act (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).

4.1.1.17 Hazardous Substances Act (Act 15 of 1973)

This Act provides for the control of substances which may cause injury or ill health to, or death, of human beings by reason of their toxic, corrosive, irritant, strongly sensitising or flammable nature. To provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products.

4.1.1.18 The Development Facilitation Act

The Development Facilitation Act 67 of 1995 requires the setting of Land Development Objectives and the principles of this Act have also been incorporated into Chapter 5 of the Municipal Systems Act.

4.1.1.19 Potential Saldanha Bay Municipal Bye-Laws

There may be relevant bye-laws that apply, or monitoring requirements that the local authority may wish to perform. These will have to be approached directly.

4.1.1.20 Provincial, National and International Guidelines

- Guidelines published in terms of the NEMA EIA Regulations, in particular:
 - Guideline on Transitional Arrangements (DEA&DP, March 2013)
 - Guideline on Alternatives (DEA&DP, March 2013);
 - Guideline on Public Participation (DEA&DP, March 2013);
 - Guideline on Need and Desirability (DEA&DP, March 2013);
 - Guideline on Generic Terms of Reference for EAP's and Project Schedules (DEA&DP, March 2013);
 - Guideline on Exemption Applications (DEA&DP, March 2013); and
 - Guideline on Appeals (DEA&DP, March 2013).
 - Guideline on Public Participation (DEA, October 2012)
- Integrated Environmental Management Information Series (Booklets 1 to 23) (DEAT, 2002 – 2005);
- Guidelines for Involving Specialists in the EIA Processes Series (DEA&DP; CSIR & Tony Barbour, 2005 – 2007);
- United Nations Environmental Programme (UNEP). 2008. Resource and Guidance Manual for Environmental Impact assessment for Desalination;
- The World Health Organisation. 2011. Safe Drinking Water from Desalination;
- Latterman, S. 2011. The Development of an Environmental Impact assessment and Decision Support system for Seawater Desalination Plants;
- The Department of Water Affairs (DWAF). First Edition. 1995. South African Water Quality Guidelines for Coastal Marine Waters;
- The Department of Water Affairs and Forestry (DWAF). 2004. Operational Policy for the Disposal of land-Derived Water Containing Waste to the Marine Environment of South Africa;
- National Programme of Action for the Protection the Marine Environment from Land-Based Activities, 2008;
- The Department of Water Affairs and Forestry (DWAF). 2007. Guidelines for the Evaluation of the Possible Environmental Impacts during the Development of the Seawater Desalination Process;
- The Department of Water Affairs and Forestry (DWAF). 2006. A Desalination Guide for South African Municipal Engineers ;
- The development of a common set for water quality and sediment guidelines for the coastal zone of the BCLME. Project BEHP/LBMP/03/04. CSIR. Prepared for the BCLME; and the
- Benguela Current Large Marine Ecosystem (BCLME), 2008.

Of particular relevance to this project is a study that is currently being undertaken by Royal HaskoningDHV on behalf of DEA&DP: **“Coastal Management/Setback lines for the West Coast District, Western Cape”** The final study will be submitted to cabinet for approval and public comment.

The ICM Act allows coastal setback/management lines to demarcate areas where authorities may prohibit or restrict the building, erection, alteration or extension of structures that are either wholly or partly seaward of the line. The littoral active zone informs the placement of the setback/management line which may extend inland of the coastal zone. Coastal setback/management lines may be established for various reasons, e.g., a setback/management line for anticipated erosion management and another to protect a specific scenic landscape.

In an effort to reduce future risk, inform forward planning and address current risk, the Western Cape Government has embarked on a refined methodology for the delineation of coastal management lines along the West Coast District. Modelling for physical processes was conducted for this area and incorporated a number of environmental factors such as sea level rise, storm surge and coastal erosion. This information along with other relevant environmental information was used to demarcate the predicted physical processes for three time horizons, i.e. short, medium and long term. This scientifically defensible information was then incorporated into the coastal setback/management line delineation.

Frontier Utilities has confirmed that the draft coastal setback line report will be taken into account by their engineers in the final design of the proposed pipeline and associated infrastructure. To this effect, Frontier stated that it would not build pump station E within the coastal setback line which is usually within 150 meters from the coast line. Pump station E will be built more than 200 m from the coast line.

The Generic Draft Environmental Management Programme for Saldanha Bay (2014) compiled by DEA&DP will also be taken into for the SRMO Project.

Other Acts, standards and/or guidelines which may also be applicable will be reviewed in more detail as part of the specialist studies to be conducted for the EIA. In addition to the regional, national and international legislative requirements, there are international standards, protocols and guidelines that are applicable for a desalination plant project.

South Africa's Operational Policy for the Disposal of Land-derived Wastewater to the Marine Environment (DWAF 2004 a-c) is of relevance. Specifically, environmental quality objectives need to be set for the marine environment, based on the requirements of the site-specific marine ecosystems, as well as other designated beneficial uses (both existing and future) of the receiving environment. The identification and mapping of marine ecosystems and the beneficial uses of the receiving marine environment provide a sound basis from which to derive site-specific environmental quality objectives (Taljaard *et al.*, 2006). To ensure that environmental quality objectives are practical and effective management tools, they need to be set in terms of measurable target values, or ranges for specific water column and sediment parameters, or in terms of the abundance and diversity of biotic components. The South African Water Quality Guidelines for Coastal Marine Waters (DWAF, 1995) provide recommended target values (as opposed to standards) for a range of substances, but these are not exhaustive. Therefore, in setting site-specific environmental quality objectives, the information contained in the DWAF guideline

document is supported by additional information obtained from published literature and best available international guidelines (e.g. ANZECC, 2000; World Bank, 1998). Recommended target values are also reviewed and summarized in the Benguela Current Large Marine Ecosystem (BCLME) document on water quality guidelines for the BCLME region (CSIR 2006).

The International Finance Corporation, a component of the World Bank Group, has developed operational policies (IFC 1998) that require that an impact assessment is undertaken within the country's overall policy framework and national legislation, as well as international treaties, and that natural and social aspects are to be considered in an integrated way. The IFC has further published Environmental, Health, and Safety Guidelines (known as the 'EHS Guidelines') containing guidelines and standards applicable to projects discharging industrial wastewater (IFC 2007). The EHS Guidelines contain the performance levels and measures that are normally acceptable to the IFC and are generally considered to be achievable in new facilities at reasonable costs by existing technology. The EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP), as defined in IFC's Performance Standard 3 on Pollution Prevention and Abatement (IFC 2006). This Performance Standard has the objective of avoiding and minimising adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities. It outlines a project approach to pollution prevention and abatement in line with internationally disseminated pollution prevention and control technologies and practices. In addition, Performance Standard 3 promotes the private sector's ability to integrate such technologies and practices as far as their use is technically and financially feasible and cost-effective in the context of a project that relies on commercially available skills and resources.

Other guidance documents are those of the California Coastal Commission (Sea water Desalination and the California Coastal Act, 2004), the United Nations Environmental Programme (UNEP 2008) and the World Health Organisation (WHO, 2008) that include international best practices and principles such as the precautionary approach and describe how design and construction approaches can mitigate likely impacts.

The Rio Declaration on the Environment and Development (1992), which calls for use of EIA as an instrument of national decision making (Principle 17). Moreover, it establishes important principles for sustainable development that should be reflected in EIAs, such as the application of the precautionary principle (Principle 15, whereby, where there is uncertainty in the nature and severity of a potential impact, conservative assumptions are made with respect to the significance and potential severity of the impact being assessed).

As signatory to the Convention of Biological Diversity and Convention to Combat Desertification, South Africa is committed to the preservation of rare and endemic species, and to provide protection for ecosystems and natural life-support processes within the country's boundaries. As a signatory of the United Nations Law of the Sea Convention of 1982, South Africa is required to adopt legislation to reduce marine

pollution from seabed activities in the Exclusive Economic Zone (EEZ) and on the continental shelf, and from land-based sources.

4.1.2 International Conventions

4.1.2.1 SADC Protocol on Shared Water Systems 1998

The objective of the Protocol is to promote responsible and sustainable use of the living aquatic resources and ecosystems of interest to State Parties in order to promote and enhance food security and human health, safeguard the livelihood of fishing communities, to generate economic opportunities for nationals in the region, to ensure that future generations benefit from these renewable resources and to alleviate poverty with the ultimate objective of its eradication

4.1.2.2 London Convention 1972

The London Convention 1972 is an international treaty that limits the discharge of waste that are generated on land and disposed of at sea. The 1996 Protocol is a separate agreement that modernised and updated the London Convention, following a detailed review that began in 1993. The 1996 Protocol will eventually replace the London Convention. States can be a Party to either the London Convention 1972, or the 1996 Protocol, or both. The Protocol defines dumping, amongst others as 'any deliberate disposal into the sea of waste or other matter from vessels, aircraft, platforms or other man-made structures at sea'.

South Africa is a signatory to the 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Waste and Other Matter 1972, as amended (London Convention) The Dumping at Sea Control Act (No. 73 of 1980) gives legal status to the London Convention in South Africa (to be replaced by the National Environmental Management: Integrated Coastal Management Bill).

4.1.2.3 UNCLOS 1992

UNCLOS is an attempt by the international community to regulate all aspects of the resources of the sea and its uses. Among the most important features of the treaty are included navigational rights, territorial sea limits, economic jurisdiction, legal status of resources on the seabed beyond the limits of national jurisdiction, passage of ships through narrow straits, conservation and management of living marine resources, protection of the marine environment, a marine research regime and, a more unique feature, a binding procedure for settlement of disputes between States.

4.1.2.4 Global Programme of Action for Protection of the Marine Environment 1995

The GPA builds on the principles of Agenda 21 and was adopted in November 1995. The programme is designed to assist states in taking action, individually or jointly, within their respective policies, priorities and resources, that will lead to the prevention, reduction, control or elimination of the degradation of the marine environment, as well

as to its recovery, from the impacts of land-based activities (including pollution and developments/activities leading to the destruction of marine habitat). The GPA identifies the Regional Seas Programme of UNEP as an appropriate framework for delivery of this programme at regional level. South Africa upholds the principles of GPA.

4.1.2.5 Convention on Biological Diversity 1992

The Convention on Biological Diversity has three objectives: the conservation of biological diversity; the sustainable use of biological resources; and the fair and equitable sharing of benefits arising from the use of genetic resources.

As a party to the Convention, South Africa is required to develop national strategies, plans or programmes, or adapt existing ones, to address the provisions of the Convention, and to integrate the conservation and sustainable use of biodiversity into sectoral and cross-sectoral plans, programmes and policies. South Africa's response to this requirement is contained in the White Paper on the Conservation and sustainable use of South Africa's biological diversity (July 1998), given legal status through the National Environmental Management: Biodiversity Protection Act (No. 10 of 2004).

4.1.2.6 Convention to Combat Desertification 1994

The United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa is a Convention to combat desertification and mitigate the effects of drought through national action programs that incorporate long-term strategies supported by international cooperation and partnership arrangements.

4.1.2.7 Ramsar Convention 1971

The broad aims of this Convention are to stem the loss and to promote wise use of all wetlands. The Convention includes estuaries in its definition of wetlands. The Convention defines wetlands as 'areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres' (which includes estuaries).

South Africa presently has 17 sites designated as Ramsar sites with a total surface area of 498 721 ha, including estuaries such as the Orange, Verlorenvlei, Sout (De Hoop Vlei), Heuningnes (De Mond), St Lucia and Kosi Bay. A Wetland Conservation Bill has been proposed which will further assist South Africa in meeting the aims of the Convention.

4.1.2.8 Bonn Convention 1979

The Bonn Convention was a response to the need for nations to co-operate in the conservation of animals that migrate across their borders. These include terrestrial mammals, reptiles, marine species and birds. Special attention is paid to endangered species. South Africa is a major partner in this Convention as it is the terminus for many

of the migratory species, both the Palaearctic (birds) and the Antarctic species (whales and birds). South Africa acceded to the Convention in December 1991.

4.1.2.9 The Abidjan Convention, 1981 & the Nairobi Convention 1985

In 1974, the United Nations Environment Programme (UNEP) initiated the Regional Seas Programme with a view to improving the control of marine pollution and management of marine and coastal resources (including estuaries). The Programme covers eleven regions. For each region an action plan was developed which included a Regional Convention and technical protocols signifying the commitment of participating countries to address, individually and jointly, their common problems. The regions including South Africa are the West and Central African region (Abidjan Convention, came into force in South Africa in 1984) and the Eastern African or West Indian Ocean (WIO) region (Nairobi Convention, came into force in South Africa in 1996).

4.1.2.10 United Nations Framework Convention on Climate Change 1992

The United Nations Framework Convention on Climate Change sets an "ultimate objective" of stabilising greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Countries ratifying the Convention agree to take climate change into account in such matters as agriculture, energy, natural resources, and activities involving sea coasts. They agree to develop national programmes to slow climate change. The Convention encourages parties to cooperate to reduce greenhouse gas emissions, share technology and carry out scientific research.

South Africa ratified the Convention in 1997. The Department of Environmental Affairs and Tourism published a Climate Change Policy Discussion Document in 1998 to begin the process of formulating policies to respond to climate change both locally and internationally.

4.1.2.11 Agenda 21 1992 & Johannesburg Summit 2002

Agenda 21 is an internationally accepted strategy for sustainable development, decided upon at the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro in 1992. Agenda 21 is, however, not legally binding on states, and merely acts as a guideline for implementation. The Johannesburg Summit presented an opportunity for current leaders to adopt concrete steps and identify quantifiable targets for better implementing Agenda 21.

Agenda 21 requires, for example, the preparation of a State of the Environment Report prepared on national, provincial and local level (responsibility of the National Department of Environmental Affairs and Tourism, Provincial Departments of Environmental Affairs and Local Authorities, respectively. These may include State of the Estuaries reports.

4.2 ENVIRONMENTAL AUTHORISATIONS AND PERMITS REQUIRED

The following Environmental Authorisations and permits will be required for the proposed SRMO Project. This will be confirmed and obtained from the relevant authorities before construction commences.

In terms of the ICM Act of 2008 a Coastal Waters Discharge Permit (CWDP) will be required from the 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 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. The Application is attached as Annexure 4 in Volume III of this report.

In terms of Section 38 of ICM Act, the Coastal Management Unit ("CMU") of the DEA&DP is the provincial lead agency for coastal management in the Western Cape as well as the competent authority for the administration of certain provisions of "The control of vehicles in the coastal zone regulations (GN No 1399, 21 December 2001, as amended) "ORV Regulations".

In terms of the National Water Act (No. 36 of 1998), a Water Use License Application (WULA) must be submitted to the Department of Water Affairs and Sanitation (DWS): Western Cape as there will be development within 500 m of wetlands. Should the wetlands described in this report be disturbed or altered; a WULA for Section 21(c) (impeding or diverting the flow of water in a watercourse) and 21(i) (altering the bed, banks, course or characteristics of a watercourse) will be required before constructing the pipeline. AGES Gauteng will submit a WULA on behalf of Frontier Utilities to DWS for approval.

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

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

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

Additional permits may be required further into the development process should, for example: any rare plant species be encountered onsite. Planning permits pertaining to the Sea Shore Act (Act 21 of 1935) for shore crossing and other servitude registration permits will also be required by the applicant. A full inventory of these permits is provided in Table 4.2 below:

Table 4.2 Environmental Authorisations and permits required for the proposed Saldanha Regional Marine Outfall 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 (DEA&DP): Land Management	The proposed SRMO Project includes listed activities triggered under the 2010 NEMA EIA Regulations. The SRMO Project contains listed activities that require full Scoping and Environmental Impact Reporting (S&EIR) GN.R545, and listed activities which require a Basic Assessment in terms of GN.R544 and GN.R546. These activities are included in Table 1.4 of Chapter 1. Listed activities are also triggered under the 2014 NEMA EIA Regulations which subsequently came into effect on 4 December 2014. These activities are included in Table 1.5 of Chapter 1.
Integrated Coastal Management Act (No. 24 of 2008). Coastal Waters Discharge Permit	Department of Environmental Affairs Oceans and Coasts (DEA:O&C): 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	DEA&DP and/or CapeNature	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 land 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: Regulations for the control of Vehicles in the Coastal Zone. Permission required	DEA&DP: Coastal Management Unit	The development of the pipeline traversing the sea shore will require an Off Road Vehicle licence in accordance with Regulation 1399.
A Permit to remove rare plant species if present.	CapeNature	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 or 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) Water Use License Application (WULA).	Department of Water Affairs and Sanitation: 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. AGES Gauteng has prepared the WULA and will submit it to DWS for approval.

4.3 WATER QUALITY GUIDELINES FOR BRINE DISCHARGE

The primary policy and legislation that need to be considered is that related to the brine (and co-discharges) from the proposed SRMO Project. In terms of policy, legislation and practice the following documents are of relevance:

- South Africa's "Operational policy for the disposal of land-derived wastewater to the marine environment" (DWAF, 2004a-c) that captures the legislative framework of relevance to this study;
- National Water Quality Management Framework (DWAF, 2002); and
- Documentation of relevance to licensing a wastewater discharge to the marine environment (*e.g.* DWAF, 2000, 2003a, 2003b).

The key management institutions and role-players in the decision on the acceptability of the proposed water discharges into Saldanha Bay are the Saldanha Bay Water Quality Forum Trust (SBWQFT) in an advisory role, the DWAF¹, the DEA and DEA&DP, all of whom will ensure transparent and adequate stakeholder and public participation.

Specifically, environmental quality objectives need to be set for the marine environment, based on the requirements of the site-specific marine ecosystems, as well as other designated beneficial uses (both existing and future) of the receiving environment. The identification and mapping of marine ecosystems and the beneficial uses of the receiving marine environment provide a sound basis from which to derive site-specific environmental quality objectives (Taljaard *et al.* 2006). To ensure that environmental quality objectives are practical and effective management tools, they need to be set in terms of measurable target values, or ranges for specific water column and sediment parameters, or in terms of the abundance and diversity of biotic components.

The *South African Water Quality Guidelines for Coastal Marine Waters* (DWAF 1995) provide recommended target values (as opposed to standards) for a range of substances, but these are not exhaustive. Therefore, in setting site-specific environmental quality objectives, the information contained in the DWAF guideline document is supplemented by additional information obtained from published literature, best available international guidelines (*e.g.* ANZECC 2000; World Bank 1998), as well as site-specific data and information (*e.g.* obtained through numerical modelling outputs). The relevant and expanded set of target values for the Benguela Current Large Marine Ecosystem countries (Angola, Namibia and South Africa) are summarised in Taljaard (2006) and provided in Table 4.3 below.

¹ The DWAF previously has indicated that the Water Quality Management Plan developed by the SBWQFT and associated studies (*e.g.* Taljaard and Monteiro, 2002, Monteiro and Kemp, 2004), together with representations from the DEAT, will play a significant role in its decision-making, *i.e.* the present *Saldanha Bay water quality management plan and associated scientific studies*, together with the relevant *policy legislation and licensing procedures*, will form the basis upon which a decision is made on the viability of the proposed SRMO Project and the subsequent granting of a licence for such a discharge.

Saldanha Bay and Jacobsbaai support an important mussel farming industry. In South Africa, standards controlling the quality of fish and shellfish flesh for human consumption (*i.e.* concentration limits of constituents as required by law) are set out in the following legislation:

- Foodstuffs, Cosmetics and Disinfectants Act (Act 54 of 1972), Regulation - Marine food, 2 November 1973; and
- Foodstuffs, Cosmetics and Disinfectants Act (Act 54 of 1972), Regulations related to metals and foodstuffs, 9 September 1994.

In principle, these food quality standards should be met if the quality of the water from which these organisms are harvested or cultured complies with the recommended target values for mariculture, as specified in the South Africa Water Quality Guidelines for Coastal Marine Waters (DWAF, 1995).

Table 4.3 Water quality guidelines for the discharge of brine into the marine environment

VARIABLE	SOUTH AFRICA (DWAf 1995)	AUSTRALIA/NEW ZEALAND (ANZECC 2000)	WORLD BANK ^a (World Bank 1998)	US ENVIRONMENTAL PROTECTION AGENCY (EPA 2006)
Zone of impact / mixing zone	To be kept to a minimum, the acceptable dimensions of this zone informed by the EIA and requirements of licensing authorities, based on scientific evidence.	-	100 m radius from point of discharge for temperature	
Temperature ^b	The maximum acceptable variation in ambient temperature is $\pm 1^{\circ}\text{C}$	Where an appropriate reference system(s) is available, and there are sufficient resources to collect the necessary information for the reference system, the median (or mean) temperature should lie within the range defined by the 20%ile and 80%ile of the seasonal distribution of the ambient temperature for the reference system.	$< 3^{\circ}\text{C}$ above ambient at the edge of the zone where initial mixing and dilution take place. Where the zone is not defined, use 100 meters from the point of discharge when there are no sensitive aquatic ecosystems within this distance.	
Salinity ^b	33 – 36 psu	Low-risk trigger concentrations for salinity are that the median (or mean) salinity should lie within the 20%ile and 80%ile of the ambient salinity distribution in the reference system(s). The old salinity guideline (ANZECC 1992) was that the salinity change should be $< 5\%$ of the ambient salinity.	-	
Total residual Chlorine ^d	no guideline, however deleterious effects recorded for concentrations as low as 2 – 20 $\mu\text{g} \cdot \ell^{-1}$. A very conservative trigger value thus is $< 2 \mu\text{g CL} \cdot \ell^{-1}$.	3 $\mu\text{g Cl} \cdot \ell^{-1}$ measured as total residual chlorine (low reliability trigger value at 95% protection level, to be used only as an indicative interim working level) (ANZECC 2000) ^c	0.2 $\text{mg} \cdot \ell^{-1}$ at the point of discharge prior to dilution	Long-term and short-term water quality criteria for chlorine in sea water are 7.5 $\mu\text{g/l}$ and 13 $\mu\text{g/l}$, respectively
Total residual dibromonitrilopropionamide (DBNPA)	No guideline exists, suggest values ranging between 0.035 $\text{mg} \cdot \ell^{-1}$ and 0.070 $\text{mg} \cdot \ell^{-1}$	No guideline found	No guideline found	

VARIABLE	SOUTH AFRICA (DWAF 1995)	AUSTRALIA/NEW ZEALAND (ANZECC 2000)	WORLD BANK ^a (World Bank 1998)	US ENVIRONMENTAL PROTECTION AGENCY (EPA 2006)
Dissolved oxygen	For the west coast, the dissolved oxygen should not fall below 10 % of the established natural variation. For the south and east coasts the dissolved oxygen should not fall below 5 mg/ℓ (99 % of the time) and below 6 mg/ℓ (95 % of the time)	Where an appropriate reference system(s) is available, and there are sufficient resources to collect the necessary information for the reference system, the median lowest diurnal DO concentration for the period for DO should be > the 20%ile of the ambient dissolved oxygen concentration in the reference system(s) distribution. Where possible the trigger value should be obtained during low flow and high temperature periods when DO concentrations are likely to be at their lowest.	-	
Nutrients	Waters should not contain concentrations of dissolved nutrients that are capable of causing excessive or nuisance growth of algae or other aquatic plants or reducing dissolved oxygen concentrations below the target range indicated for dissolved oxygen (see above)	Default trigger values of PO ₄ -P: 100 µg. ℓ ⁻¹ NO _x -N: 50 µg. ℓ ⁻¹ NH ₄ ⁺ -N: 50 µg. ℓ ⁻¹ for the low rainfall southern Australian region (Table 3.3.8 in ANZECC 2000)	-	
Chromium	8 µg. ℓ ⁻¹ (as total Cr)	Marine moderate reliability trigger value for chromium (III) of 10 µg. ℓ ⁻¹ with 95% protection Marine high reliability trigger value for chromium (VI) of 4.4 µg. ℓ ⁻¹ at 95% protection.	0.5 mg. ℓ ⁻¹ (total Cr) for effluents from thermal power plants	1 100 µg/ℓ for highest concentration at brief exposure without unacceptable effect 50 µg/ℓ highest concentration at continuous exposure without unacceptable effect
Iron	-	Insufficient data to derive a reliable trigger value. The current Canadian guideline level is 300 µg. ℓ ⁻¹	1.0 mg. ℓ ⁻¹ for effluents from thermal power plants	

VARIABLE	SOUTH AFRICA (DWA 1995)	AUSTRALIA/NEW ZEALAND (ANZECC 2000)	WORLD BANK ^a (World Bank 1998)	US ENVIRONMENTAL PROTECTION AGENCY (EPA 2006)
Molybdenum	-	Insufficient data to derive a marine trigger value for molybdenum. A low reliability trigger value of 23 µg. ℓ ⁻¹ was adopted to be used as indicative interim working levels.	-	
Nickel	25 µg. ℓ ⁻¹ (as total Ni)	7 µg. ℓ ⁻¹ at a 99% protection level is recommended for slightly-moderately disturbed marine systems.		74 µg/ℓ for highest concentration at brief exposure without unacceptable effect 8.2 µg/ℓ highest concentration at continuous exposure without unacceptable effect

Note: (1) a mixing zone is a clearly defined area around an effluent discharge point where the effluent is actively diluted with the water of the receiving environment. This zone usually encompasses the near-field and mid-field regions of dilution to allow for the plume to mix throughout the water column. Within the mixing zone, no water quality criteria are defined for physical and chemical stressors (with the exception of a select few contaminants that may potentially bioaccumulate). It is at the boundary of the mixing zone that water quality criteria ('trigger values') are defined and need to be met to ensure the quality of nearby waters does not deteriorate as a result of the effluent discharge. There is no set procedure for sizing a mixing zone around a discharge. The boundaries of a proposed mixing zone are set according to an estimated distance from the discharge point at which point defined water quality guidelines will be met, as predicted by numerical modelling of the discharge.

- a** The World Bank guidelines are based on maximum permissible concentrations at the point of discharge and do not explicitly take into account the receiving environment, i.e. no cognisance is taken of the fact of the differences in transport and fate of pollutants between, for example, a surf-zone, estuary or coastal embayment with poor flushing characteristics and an open and exposed coastline. It is for this reason that we include in this study other generally accepted Water Quality guidelines that take the nature of the receiving environment into account.
- b** Both in the case of temperature and salinity using the maximum ΔT and ΔS measured at any location at any time during the model simulations constitutes an extremely conservative approach. We nevertheless have used the dimension of the 99% exceedance of the $\Delta T = +1^{\circ}\text{C}$ contour and the $\Delta S = 36$ psu contour as representing the "footprint" of the potential impact. This constitutes a total of approximately 6 hours per season (or one day per annum) of exposure to conditions exceeding the stated ΔT or ΔS values.
- c** The ANZECC (2000) Water Quality guideline for salinity is less stringent than, but roughly approximates, the South African Water Quality guideline that requires that salinity should remain within the range of 33 psu to 36 psu. Similarly the ANZECC (2000) Water Quality guideline for water temperature is less stringent than the South African Water Quality guideline that requires that water temperature does not vary by more than 1 °C from the ambient water temperature. The ANZECC (2000) Water Quality guideline for water temperature is likely to be particularly relevant in the bottom waters of Saldanha Bay where there is significant natural temperature variability due to upwelling cycles as the ANZECC guideline explicitly takes into account this variability and the fact that the marine ecology of the region is likely to be adapted to such variability. At these depths the South African Water Quality guideline of temperature variability of < 1 °C is likely to be very conservative (possibly overly conservative) in these circumstances.
- d** Chlorine "shocking" may be preferable in certain circumstances. This involves using high chlorine levels for a few seconds rather than a continuous low-level release. In this case the target value is a maximum value of 2 mg. ℓ⁻¹ for up to 2 hours, not to be repeated more frequently than once in 24 hours, with a 24-hour average of 0.2 mg. ℓ⁻¹ (the same limits would apply to bromine and fluorine).