

Environmental Impact Assessment (EIA) for the
Proposed Construction, Operation and
Decommissioning of a Sea Water Reverse Osmosis
Plant and Associated Infrastructure Proposed at
Lovu on the KwaZulu-Natal South Coast

FINAL EIA REPORT

CHAPTER 4: APPROACH TO EIA, LEGISLATION AND PUBLIC CONSULTATION

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4. APPROACH TO EIA, LEGISLATION AND PUBLIC CONSULTATION

Currently, a thorough interpretative legal regulatory framework within which desalination in South Africa can be best understood and explained does not exist. It is the intention of this Final EIA Report to provide an overview of all legislation and international conventions/guidelines that may inform the desalination EIA Process in South Africa to ensure that desalination procedures meet the highest possible standards of EIA and the subsequent management policies.

To that end, every pertinent component of South African legislation is listed and briefly discussed. Moreover, international conventions that dictate ‘best-practice’ from an environmental and social impact perspective is outlined briefly along with guidelines that have thus far been developed for desalination related EIA projects in South Africa and the international community.

This chapter also presents the approach to the impact assessment phase of the EIA Process, including public participation. The EIA Phase is shaped by the findings of the Scoping Process. For information from the Scoping Phase, including the approach to stakeholder engagement, identification of issues, overview of relevant legislation, and key principles and guidelines that provide the context for this EIA Process, refer to the Final Scoping Report (CSIR, 2015).

The DEAT General Guide to the EIA Regulations (Guideline 3, 2006) states that when the Competent Authority has accepted the Scoping Report and Plan of Study for EIA, the EIA Phase may commence. The purpose of the EIA Phase is to:

- Address issues that have been raised through the Scoping Process;
- Assess alternatives to the proposed activity in a comparative manner;
- Assess all identified impacts and determine the significance of each impact; and
- Recommend actions to avoid/mitigate negative impacts and enhance benefits.

The EIA Phase consists of three parallel and overlapping processes:

- Assessment process involving the authorities where inputs are integrated and presented in documents that are submitted for approval by authorities (Sections 4.1, 4.4 and 4.5);
- Public participation process whereby findings of the EIA Phase are communicated and discussed with I&APs and responses are documented (Section 4.4); and
- Specialist studies that provide additional information required to address the issues raised in the Scoping Phase (Sections 4.7 and 4.8).

The EIA Process is a planning, design and decision making tool used to demonstrate to the responsible authority, DEA, and the project proponent, Umgeni Water, what the consequences of their choices will be in biophysical, social and economic terms. As such it identifies potential impacts (negative and positive) that the project may have on the environment. The EIA makes recommendations to mitigate negative impacts and enhance positive impacts associated with the proposed project.

4.1. OVERVIEW OF APPROACH TO PREPARING THE EIA REPORT AND EMPR

The results of the specialist studies and other relevant project information have been synthesised and integrated into this Final EIA Report. The Final EIA Report is being released for a 40-day I&AP and authority review period, as outlined in Sections 4.4 and 4.5. All registered I&APs on the project database will be notified in writing of the release of the Final EIA for review. It is proposed that during this review period a public meeting is held as well as focus group meetings with key I&APs. The purpose of these meetings is to provide an overview of the outcome and recommendations from the specialist studies, as well as provide an opportunity for comment. Comments that have been received after the submission of the Final Scoping Report and prior to the review period of the Final EIA Report have been summarized for inclusion in the Comments and Responses Trail in Chapter 5 of this Final EIA Report. Copies of the written comments received are attached in Appendix E of this Final EIA Report.

In line with Regulation 56 (6) of the 2010 EIA Regulations, the Final EIA Report is released to registered I&APs for an additional 21 day review period after which it will be amended (if necessary) and submitted to the DEA for decision-making. During this 21-day comment period, any comments raised by I&APs must be sent directly to the DEA Case Officer and copied to the EAP. Comments raised will be responded to by the CSIR EIA team and/or the applicant (Umgeni Water). These responses will indicate how the issue has been dealt with in the EIA Process. Should the comments received fall beyond the scope of this EIA, clear reasoning will be provided in the Comments and Responses Trail.

This Final EIA Report includes a Final EMPr which has been prepared in compliance with the relevant regulations. This EMPr is based broadly on the environmental management philosophy presented in the ISO 14001 standard, which embodies an approach of continuous improvement. Actions in the EMPr are drawn primarily from the proposed management actions identified in the specialist studies for the construction and operational phases of the project. If the desalination plant components are decommissioned or re-developed, this will need to be done in accordance with the relevant environmental standards and clean-up/remediation requirements applicable at the time.

4.2. LEGISLATION, EIA GUIDELINES AND INTERNATIONAL CONVENTIONS

4.2.1. National Legislation

4.2.1.1. *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.

4.2.1.2. *National Environmental Management Act (NEMA) (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 DEA 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. In 2006, 2010, and 2014, EIA Regulations

were promulgated under this Act to regulate procedures and criteria for the submission, perusal, consideration and decision of application for Environmental Authorisation of specified activities. These regulations also bear on activities within the coastal zone which require Environmental Authorisation before they can proceed.

4.2.1.3. 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)

Section 24(1) of NEMA states:

- *"In order to give effect to the general objectives of integrated environmental management laid down in this Chapter, the potential impact on the environment of listed activities must be considered, investigated, assessed and reported to the competent authority charged by this Act with granting the relevant environmental authorisation."*

The reference to "listed activities" in section 24 of NEMA relates to the regulations promulgated respectively in Government Notices R544, R545 and R546 (as amended) in Government Gazette 33306, dated 18 June 2010, which came into effect on 2 August 2010. The relevant Government Notices published in terms of NEMA collectively comprise the NEMA EIA Regulations listed activities that require either a Basic Assessment, or Scoping and EIA (that is a "full EIA") be conducted, as indicated below:

- EIA Procedures (GN R543);
- Listing Notice 1 (listed activities for which a Basic Assessment Process needs to be conducted) (GN R 544);
- Listing Notice 2 (listed activities for which a Scoping/EIA Process must be conducted) (GN R545);
- Listing Notice 3 (listing activities and sensitive areas per province, for which a Basic Assessment Process must be conducted) (GN R546); and
- Environmental Management Framework regulations (GN R547).

Since this promulgation, further amendments had been incorporated in published Correction Notices (July and December 2010 respectively). These regulations came into effect on 02 August 2010 (GN R660, GN R661, GN R662, GN R663, GN R664 and GN R665 in Government Gazette 33411 of 02 August 2010). The proposed Lovu desalination project requires a full EIA, as it triggers listed activities included in Listing Notice 2 of the 2010 EIA Regulations (i.e. GN R545).

All the listed activities potentially forming part of this proposed development and therefore requiring Environmental Authorisation were included in the Application Form for Environmental Authorisation that was prepared and submitted to the DEA on 12 December 2013 and accepted on 10 March 2014. A Letter of Acknowledgement from DEA stipulating the Final scoping report is included in Appendix C of this Final EIA Report.

It is important to note that the Application for Environmental Authorisation was submitted to the DEA and accepted in terms of the 2010 EIA Regulations (as amended), prior to the promulgation of the new EIA Regulations in GN 982, 983, 984 and 985 on 8 December 2014. However, Section 53 (1) of the Transitional Arrangements, included in Chapter 8 of the 2014 EIA Regulations (i.e. GN R982), states the following:

- *“53. (1) An application submitted in terms of the previous NEMA regulations and which is pending when these Regulations take effect, including pending applications for auxiliary activities directly related to prospecting or exploration of a mineral or petroleum resource; or extraction and primary processing of a mineral or petroleum resource, must despite the repeal of those Regulations be dispensed with in terms of those previous NEMA regulations as if those previous NEMA regulations were not repealed”.*

Therefore, in accordance with the Transitional Arrangements included in the 2014 EIA Regulations, i.e. Regulation 53 (1) of the 2014 EIA Regulations, the proposed application can continue to be assessed and processed in terms of the 2010 EIA Regulations (as amended). However, for purposes of completeness and relevance, the relevant listed activities of the 2014 EIA Regulations that apply to the proposed project and corresponds to the listed activities included in the original Application for Environmental Authorisation (in accordance with the 2010 EIA Regulations) has been included in this Final EIA Report (as specified in the Transitional Arrangements of the 2014 EIA Regulations). The applicable activities in terms of the 2010 and 2014 EIA Regulations are provided in Table 4.1.

Linked to the above, Section 53 (2) of the Transitional Arrangements of the 2014 EIA Regulations states:

- *“If a situation arises where an activity or activities, identified under the previous NEMA Notices, no longer requires environmental authorisation in terms of the current activities and competent authorities identified in terms of section 24(2) and 24D of the National Environmental Management Act, 1998 (Act No. 107 of 1998) or in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), and where a decision on an application submitted under the previous NEMA regulations is still pending, the competent authority will consider such application to be withdrawn”.*

Therefore, based on the above, it is understood that certain listed activities that were included in the original Application for Environmental Authorisation that was submitted to the DEA on 12 December 2013 may no longer be applicable to the proposed project. An amended EIA application form was therefore submitted to DEA and is attached as Appendix B of this Final EIA Report.

It should be noted that a precautionary approach was followed when identifying listed activities in the Application Form for Environmental Authorisation, i.e. if the activity potentially forms part of the project, it is listed. However, the final project description will be shaped by the findings of the EIA Process and certain activities may be added or removed from the project proposal. The DEA will be informed in writing of such amendments and I&APs will also be informed accordingly.

Table 4-1 Listed activities applied for in terms of the 2010 EIA Regulations. The relevant listed activities from the 2014 EIA Regulations have also been included where applicable

Listed activity as described in GN R544, R545 and R546	Listed activity as described in GN R983, R984 and R985	Description of project activity that triggers listed activity
<p>GN R544 Item 9 (i, ii):</p> <p>The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water -</p> <p>(i) with an internal diameter of 0,36 metres or more; or</p> <p>(ii) with a peak throughput of 120 litres per second or more,</p> <p>excluding where - such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.</p>	<p>GN R983 Item 9 (i, ii):</p> <p>The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water -</p> <p>(i) with an internal diameter of 0,36 metres or more; or</p> <p>(ii) with a peak throughput of 120 litres per second or more;</p> <p>excluding where-</p> <p>(a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve; or</p> <p>(b) where such development will occur within an urban area.</p>	<p>Pipelines will be required to transport raw water abstracted from the sea to the proposed desalination plant, and potable water from the desalination plant to Umgeni Water's bulk water supply systems. These pipelines will cumulatively exceed 1 000 m in length and will be designed with an internal diameter greater than 1.0 m. The rates of peak throughput are anticipated to exceed 120l/s. These will be confirmed during the detailed engineering design phase.</p> <p>Portions of the pipeline routing may occur within existing road reserves, while construction of pipeline infrastructure would occur outside of urban areas. This will be confirmed in the detailed engineering design phase.</p>
<p>GN R544 Item 10 (i):</p> <p>The construction of facilities or infrastructure for the transmission and distribution of electricity, outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.</p>	<p>GN R983 Item 11 (i):</p> <p>The development of facilities or infrastructure for the transmission and distribution of electricity –</p> <p>(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.</p>	<p>Electrical infrastructure will be required to provide power to the proposed development and will most likely be located outside an urban area. The voltage and exact location of such infrastructure will be finalised during the detailed engineering design phase.</p> <p>Based on the detailed feasibility study undertaken in June 2015 by the Applicant and their appointed consulting engineers, the power supply to the proposed 150 Ml/day desalination plant is approximately 32MW, with the following requirements:</p> <ul style="list-style-type: none"> • A 132kV transmission line from the nearest substation located outside the desalination plant boundary. The nearest 132kV point of supply is indicated as Kingsburg Major Substation in Illovo and is approximately 2.5km from the proposed desalination plant site. • A 132kV to 11kV step-down substation. • 30 MVA bulk supply point at 11kV.

Listed activity as described in GN R544, R545 and R546	Listed activity as described in GN R983, R984 and R985	Description of project activity that triggers listed activity
		<p>The power supply to the sea water pump station at the beach would be extended from the desalination plant site via an 11kV overhead line to be installed between the desalination plant and the sea water pump station.</p> <p>A dual supply involving a proposed tee-off from two existing 88kV lines running passed Kingsburgh Major Substation will ensure a continuity of supply in the event of one substation becoming locked out.</p>
<p>GN R544 Item 11 (iii, vi, viii, x, xi):</p> <p>The construction of:</p> <ul style="list-style-type: none"> (iii) bridges; (vi) bulk storm water outlet structures; (viii) jetties exceeding 50 square metres in size; (x) buildings exceeding 50 square metres in size; or (xi) infrastructure or structures covering 50 square metres or more <p>where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</p>	<p>GN R983 Item 12 (iii, vi, viii, x, xii; a and c):</p> <p>The development of-</p> <ul style="list-style-type: none"> (iii) bridges exceeding 100 square metres in size; (vi) bulk storm water outlet structures exceeding 100 square metres in size; (viii) jetties exceeding 100 square metres in size; (x) buildings exceeding 100 square metres in size; (xii) infrastructure or structures with a physical footprint of 100 square metres or more; <p>where such development occurs –</p> <ul style="list-style-type: none"> (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; - <p>excluding-</p> <ul style="list-style-type: none"> (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or 	<p>Pipeline infrastructure proposed as part of the desalination project or will traverse watercourses in the region and or will require the construction of a bridge across the estuary near the proposed desalination plant. Bulk storm water systems and associated outlet structures at the desalination plant will be appropriately designed during the detailed design phase and may be located within 32 m of a watercourse. The laying down of the marine pipelines on the seabed will require the construction of a temporary jetty which will exceed 100 square metres. The construction of new buildings and supporting infrastructure exceeding 100 m² and may be required within 32 m of a watercourse. Further investigation into these aspects of the proposed development will form part of the detailed engineering design phase.</p>

Listed activity as described in GN R544, R545 and R546	Listed activity as described in GN R983, R984 and R985	Description of project activity that triggers listed activity
	activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; or (ee) where such development occurs within existing roads or road reserves.	
GN R544 Item 13: The construction of facilities or infrastructure for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 but not exceeding 500 cubic metres.	GN R983 Item 14: The development of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	Pre- and post- water treatment chemicals will be required at the proposed desalination plant and the capacity of is not expected to exceed 80 m ³ . However, at this stage it is uncertain exactly what quantities of dangerous goods will be used during operation of the desalination plant. Further investigation into these aspects of the proposed development will form part of the detailed engineering design phase and will be based on the results of the pilot plant. This activity is therefore kept in this EIA application in the event that the results from the pilot plant investigations show that the quantities of chemicals required to be stored exceed the anticipated amounts.
GN R544 Item 14: The construction of structures in the coastal public property where the development footprint is bigger than 50 square metres, excluding (i) the construction of structures within existing ports or harbours that will not increase the development footprint or throughput capacity of the port or harbour; (ii) the construction of a port or harbour, in which case activity 24 of Notice 545 of 2010 applies; and (iii) the construction of temporary structures within the beach zone where such structures will be demolished or disassembled after a period not exceeding 6 weeks.	GN R983 Item 15: The development of structures in the coastal public property where the development footprint is bigger than 50 square metres, excluding – (i) the development of structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (ii) the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (iii) the development of temporary structures within the beach zone where such structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared; or (iv) (iv) activities listed in activity 14 in Listing Notice 2 of 2014, in which case that activity applies.	The intake and discharge marine pipelines will transect the Coastal Public Property and will cover an area exceeding 50 m ² . The laydown of the sea water pipelines will also require the construction of a temporary jetty and supporting structures within the littoral zone.
GN R544 Item 15:	GN R983 Item 16:	The proposed project constitutes the development of a desalination plant and is being designed with a generation

Listed activity as described in GN R544, R545 and R546	Listed activity as described in GN R983, R984 and R985	Description of project activity that triggers listed activity
The construction of facilities for the desalination of sea water with a design capacity to produce more than 100 cubic metres of treated water per day.	The development and related operation of facilities for the desalination of water with a design capacity to produce more than 100 cubic metres of treated water per day.	capacity of 150 Ml (or 150 000 m ³) of potable water per day when operating at full capacity.
<p>GN R544 Item 16 (i, v, vi):</p> <p>Construction or earth moving activities in the sea, an estuary, or within the littoral active zone or within a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever is the greater, in respect of –</p> <p>(i) fixed or floating jetties and slipways;</p> <p>(v) buildings of 50 square metres or more; or</p> <p>(vi) infrastructure covering 50 square metres or more but excluding:</p> <p>(a) if such construction or earth moving activities will occur behind a development setback line; or</p> <p>(b) where such construction or earth moving activities will occur within existing ports or harbours and the construction or earth moving activities will not increase the development footprint or throughput capacity of the port or harbour;</p> <p>(c) where such construction or earth moving activities is undertaken for purposes of maintenance of the facilities mentioned in (i)-(vi) above; or</p> <p>(d) where such construction or earth moving activities is related to the construction of a port or harbour, in which case activity 24 of Notice 545 of 2010 applies.</p>	<p>GN R983 Item 17 (i, ii, iii, v, and a, e, f):</p> <p>Development-</p> <p>(i) in the sea;</p> <p>(ii) in an estuary;</p> <p>(iii) within the littoral active zone;</p> <p>(v) if no development setback exists, within a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever is the greater;</p> <p>in respect of-</p> <p>(a) fixed or floating jetties and slipways;</p> <p>(e) buildings of 50 square metres or more; or</p> <p>(f) infrastructure with a development footprint of 50 square metres or more -</p> <p>but excluding-</p> <p>(aa) the development of infrastructure and structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</p> <p>(bb) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;</p> <p>(cc) the development of temporary infrastructure or structures where such structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared; or</p> <p>(dd) where such development occurs within an urban area.</p>	<p>Construction and earth moving activities required for the proposed project will occur within the sea (marine intake and discharge pipelines and associated infrastructures, including temporary jetty), in the Lovu estuary (bridge), the littoral active zone (pipelines) and within 100 m inland of the high-water mark of the sea and of the Lovu estuary (e.g. preferred desalination plant site, pipelines from the pump station to the plant). Infrastructure and buildings associated with the proposed project will cover an area that exceeds 50 m².</p>
<p>GN R544 Item 17:</p> <p>The planting of vegetation or placing of any material on dunes and exposed sand surfaces, within the littoral</p>	<p>GN R983 Item 18:</p> <p>The planting of vegetation or placing of any material on dunes or exposed sand surfaces of more than 10 square metres,</p>	<p>Post-construction activities would involve the planting of vegetation within the littoral active zone as part of the site stabilization and rehabilitation measures should trenching of the pipelines be undertaken instead of tunneling/pipe jacking.</p>

Listed activity as described in GN R544, R545 and R546	Listed activity as described in GN R983, R984 and R985	Description of project activity that triggers listed activity
active zone for the purpose of preventing the free movement of sand, erosion or accretion, excluding; where the planting of vegetation or placement of material relates to restoration and maintenance of indigenous coastal vegetation or, where such planting of vegetation or placing of material will occur behind a development setback line.	within the littoral active zone, for the purpose of preventing the free movement of sand, erosion or accretion, excluding where – (i) the planting of vegetation or placement of material relates to restoration and maintenance of indigenous coastal vegetation undertaken in accordance with a maintenance management plan; or (ii) such planting of vegetation or placing of material will occur behind a development setback.	
GN R544 Item 18 (i, ii, iii, iv): The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from: (i) a watercourse; (ii) the sea; (iii) the seashore; (iv) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater, but excluding where such infilling, depositing, dredging, excavation, removal or moving: (a) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or (b) occurs behind the development setback line.	GN R983 Item 19 (i, ii, iii): The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from – (i) a watercourse; (ii) the seashore; or (iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater but excluding where such infilling, depositing, dredging, excavation, removal or moving- (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.	Construction activities required for the proposed project (such as trench digging and pipe laying, construction of preferred desalination plant site) would result in the infilling, depositing, dredging, excavation, removal or moving of more than 5 m ³ of material from the sea, watercourse, the seashore, the littoral active zone, estuary and within a distance of 100 m inland of the high-water mark of the sea and estuary.
GN R544 Item 22 (i, ii, iii): The construction of a road, outside urban areas, (i) with a reserve wider than 13,5 meters or, (ii) where no reserve exists where the road is wider	GN R983 Item 24 (ii): The development of- (i) a road for which an environmental authorisation was obtained for the route determination in terms of activity 5 in	The proponent intends to use existing roads to access the proposed facility (pending approval from relevant authorities). However, if a new access road needs to be constructed, it may have a reserve wider than 13,5 meters or may be wider than 8 m and would be located outside of urban

Listed activity as described in GN R544, R545 and R546	Listed activity as described in GN R983, R984 and R985	Description of project activity that triggers listed activity
than 8 metres	Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or (ii) a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; but excluding- (a) roads which are identified and included in activity 27 in Listing Notice 2 of 2014; or (b) roads where the entire road falls within an urban area.	areas. The final road design will however be determined during the detailed engineering design phase.
GN R544 Item 23 (ii): The transformation of undeveloped, vacant or derelict land to residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares, except where such transformation takes place for linear activities.	GN R983 Item 28 (ii): Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.	The proposed desalination plant will cover an area of land approximately 7 Ha in extent and will be constructed on land which is largely undeveloped and has a current land use zoning of "Agriculture". Some portions of the land are currently used for sugar cane growing. The implementation of the proposed project would therefore result in the transformation of more than 1 Ha of undeveloped Agricultural land to industrial use, and this would occur outside an urban area.
GN R544 Item 24: The transformation of land bigger than 1000 square metres in size, to residential, retail, commercial, industrial or institutional use, where, at the time of the coming into effect of this Schedule or thereafter such land was zoned open space, conservation or had an equivalent zoning.	Not applicable in Listing Notice 1 of the 2014 EIA Regulations.	The implementation of the proposed project would result in the transformation of approximately 7 Ha of undeveloped Agricultural land to industrial use. Components of the terrestrial pipelines will traverse land zoned as open space. The portion of pipelines and powerline traversing land zoned as opened space are detailed in Chapter 9 Terrestrial ecology study.
GN R544 Item 47 (i, ii): The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre - (i) where the existing reserve is wider than 13,5 meters; or	GN R983 Item 56 (i, ii): The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre - (i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is	The proponent intends to use existing roads to access the proposed facility (pending approval from relevant authorities). However, existing roads may be required to be widened by more than 6 m, or lengthened by more than 1 km. The details will be confirmed as part of the detailed engineering design phase.

Listed activity as described in GN R544, R545 and R546	Listed activity as described in GN R983, R984 and R985	Description of project activity that triggers listed activity
(ii) where no reserve exists, where the existing road is wider than 8 metres, excluding widening or lengthening occurring inside urban areas.	wider than 8 metres; excluding where widening or lengthening occur inside urban areas.	
<p>GN R545 Item 5:</p> <p>The construction of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. 544 of 2010 or included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.</p>	<p>GN R984 Item 6:</p> <p>The development of facilities or infrastructure for any process or activity which requires a permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding</p> <p>(i) activities which are identified and included in Listing Notice 1 of 2014;</p> <p>(ii) activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; or</p> <p>(iii) the development of facilities or infrastructure for the treatment of effluent, wastewater or sewage where such facilities have a daily throughput capacity of 2000 cubic metres or less.</p>	<p>The operation of the proposed desalination plant requires a Coastal Waters Discharge Permit in terms of the National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008) in order to permit the disposal and discharge of effluent to sea.</p>
<p>GN R545 Item 14:</p> <p>The construction of an island, anchored platform or any other permanent structure on or along the sea bed.</p>	<p>GN R984 Item 14:</p> <p>The development and related operation of-</p> <p>(i) an island;</p> <p>(ii) anchored platform; or</p> <p>(iii) any other structure or infrastructure on, below or along the sea bed; excluding -</p> <p>(a) development of facilities, infrastructure or structures for aquaculture purposes; or</p> <p>(b) the development of temporary structures or infrastructure where such structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.</p>	<p>Permanent structures (Sea water intake and brine discharge pipelines) required for the proposed project will be constructed along the sea bed. The pipelines will be buried through the surf zone.</p>

Listed activity as described in GN R544, R545 and R546	Listed activity as described in GN R983, R984 and R985	Description of project activity that triggers listed activity
<p>GN R545 Item 24 (iii, iv, viii, ix): Construction or earth moving activities in the sea, an estuary, or within the littoral active zone or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater, in respect of:</p> <ul style="list-style-type: none"> (iii) inter- and sub-tidal structures for entrapment of sand; (iv) breakwater structures; (viii) tunnels; or (ix) underwater channels, but excluding: <ul style="list-style-type: none"> (a) activities listed in activity 16 in Notice 544 of 2010, (b) construction or earth moving activities if such construction or earth moving activities will occur behind a development setback line; (c) where such construction or earth moving activities will occur in existing ports or harbours where there will be no increase of the development footprint or throughput capacity of the port or harbour; or (d) where such construction or earth moving activities takes place for maintenance purposes. 	<p>GN R984 Item 26 (I, ii, iii, and v; and c, d, g and h): Development--</p> <ul style="list-style-type: none"> (i) in the sea; (ii) in an estuary; (iii) within the littoral active zone; (v) if no development setback exists, within a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever is the greater; <p>in respect of -</p> <ul style="list-style-type: none"> (c) inter- and sub-tidal structures for entrapment of sand; (d) breakwater structures; (g) tunnels; or (h) underwater channels; <p>but excluding the development of structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p>	<p>Construction and earth moving activities will occur within the sea, the littoral zone and 100 metres inland of the high-watermark of the sea and the estuary. Depending on design and technical criteria of the desalination plant, structures such as inter- and sub-tidal structures for entrapment of sand, breakwater structures and tunnels and/or underwater channels may be used in the construction and operation phase of the proposed development. This will also be subject to further investigation and analysis in the detailed engineering design phase.</p>
<p>GN R546 Item 2 (a) (iii) [(dd) (gg)]: The construction of reservoirs for bulk water supply with a capacity of more than 250 cubic metres</p> <ul style="list-style-type: none"> (a) in the KwaZulu-Natal province <ul style="list-style-type: none"> (iii) outside urban areas, in: <ul style="list-style-type: none"> (dd) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans. 	<p>GN R985 Item 2 (d) [(v), (viii), (x), (xii) [(bb)]] The development of reservoirs for bulk water supply with a capacity of more than 250 cubic metres.</p> <p>in:</p> <ul style="list-style-type: none"> (d) In KwaZulu-Natal: <ul style="list-style-type: none"> viii. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; x. Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose; xii. Outside urban areas: 	<p>Two 37.5 Ml freshwater holding reservoirs and a 6Ml reservoir for screened water will be required for the proposed project and will be located at the desalination plant site (estuarine site). These reservoirs will be constructed within an area which has been identified as CBA (OCO) by the EKZNW Terrestrial Systematic Conservation Plan (Figure 4.1).</p>

Listed activity as described in GN R544, R545 and R546	Listed activity as described in GN R983, R984 and R985	Description of project activity that triggers listed activity
<p>GN R546 Item 4 (a) (ii) [(ee)]:</p> <p>The construction of a road wider than 4 metres with a reserve less than 13,5 metres in the KwaZulu-Natal province</p> <p>(ii) outside urban areas, in</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.</p>	<p>GN R985 Item 4 (d) [(viii) (x)]:</p> <p>The development of a road wider than 4 metres with a reserve less than 13,5 metres.</p> <p>(d) In KwaZulu-Natal:</p> <p>viii. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>x. Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose;</p>	<p>The proposed project may require the construction of an access road to the proposed desalination plant. If required, this road would be located outside urban areas within an area which has been identified as CBA (OCO) by the EKZNW Terrestrial Systematic Conservation Plan.</p> <p>The details will be confirmed as part of the detailed engineering design phase.</p>
<p>GN R546 Item 10 (a) (i) (ii) [(ee) (hh) (jj)]:</p> <p>The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres</p> <p>(a) in the KwaZulu-Natal province,</p> <p>(ii) outside urban areas in:</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.</p> <p>(ii) Areas on the watercourse side of the development setback line or within 100 m from the edge of a watercourse where no such setback line has been determined.</p> <p>(jj) Within 500 m of an estuary</p>	<p>GN R985 Item 10 (d) (vi) (ix) (xi):</p> <p>The development of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.</p> <p>d) In KwaZulu-Natal:</p> <p>vi. Within 500 metres of an estuarine functional zone;</p> <p>ix. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>xi. Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose;</p> <p>xiii. Outside urban areas:</p> <p>(cc) Areas within 100 metres from the edge of a watercourse.</p>	<p>The proposed project will require that chemicals such as coagulants, acids, bases, antiscalants and biocides be stored on-site for the pre-treatment/conditioning of the source water, cleaning of the reverse osmosis membrane filters and conditioning of the potable water. It is expected that the combined capacity of these chemicals storage will exceed 30 m³.</p> <p>The exact volumes will be confirmed as part of the detailed engineering design phase and will be based on the results of the pilot plant investigations. These volumes may exceed 80 m³.</p> <p>Construction of such storage facilities will occur in an area which has been identified as CBA (OCO) by the EKZNW Terrestrial Systematic Conservation Plan, within 100m of a watercourse and within 500 m from the Lovu estuary.</p>
<p>GN R.546 Item 12 (a), (b), (c):</p> <p>The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetative cover</p>	<p>GN R 985 Item 12 (b):</p> <p>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of</p>	<p>The proposed desalination plant and supporting infrastructure would require an area greater than 300 m² to be cleared of vegetation, in an area identified as critically endangered by NEMBA (threatened ecosystem – Southern</p>

Listed activity as described in GN R544, R545 and R546	Listed activity as described in GN R983, R984 and R985	Description of project activity that triggers listed activity
<p>constitutes indigenous vegetation,</p> <ul style="list-style-type: none"> (a) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; (b) Within critical biodiversity areas identified in bioregional plans; (c) within the littoral active zone or 100 metres inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas. 	<p>indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p>b) In KwaZulu-Natal:</p> <ul style="list-style-type: none"> iv. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; v. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; vi. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; vii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; xi. Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; xiii. In an estuarine functional zone. 	<p>Coastal Grassland (KZN18) and as CBA by the EKZNW Terrestrial Systematic Conservation Plan. Given the fact that the desalination plant and associated infrastructure is to be primarily situated on land which is utilised for agricultural practices, it is not anticipated that 75% of the vegetation to be cleared would constitute indigenous vegetation (refer to Chapter 9). This will however need to be ground truthed.</p> <p>However, should 75% of the cleared vegetation constitute indigenous vegetation (pump station site), this may occur within the littoral active zone or 100 m inland from high water mark of the sea within the development setback line.</p>
<p>GN R.546 Item 13 (a) (c) [(i) (ii) [(gg)]]: The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation,</p> <ul style="list-style-type: none"> (a) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans (c) in the KwaZulu-Natal province, <ul style="list-style-type: none"> (i) in an estuary (ii) outside urban areas in: <ul style="list-style-type: none"> (gg) Areas seawards of the development 	<p>Not applicable in Listing Notice 3 of the 2014 EIA Regulations.</p>	<p>Listed activity not applicable as per Section 53 (2) of the Transitional Arrangements of the 2014.</p>

Listed activity as described in GN R544, R545 and R546	Listed activity as described in GN R983, R984 and R985	Description of project activity that triggers listed activity
setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined.		
GN R.546 Item 14 (a) (i): The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation in all areas outside urban areas in the KwaZulu-Natal province.	Not applicable in Listing Notice 3 of the 2014 EIA Regulations.	Listed activity not applicable as per Section 53 (2) of the Transitional Arrangements of the 2014.
<p>GN R546 Item 16 (i) (iii) (iv), [(a) [(i) [(ff) (ii)]]]:</p> <p>The construction of:</p> <ul style="list-style-type: none"> (i) jetties exceeding 10 square metres in size; (iii) buildings with a footprint exceeding 10 square metres in size; or (iv) infrastructure covering 10 square metres or more, <p>where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line,</p> <p>(a) in the KwaZulu-Natal province:</p> <ul style="list-style-type: none"> (i) In an estuary; (ii) Outside urban areas, (ff) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans (ii) in areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined. 	<p>GN R 985 Item 14 (b) (iii) (vi) (viii) (x) (xii) (a) (c) (d) [(i) (vii) (viii) (x) [(bb)]]:</p> <p>The development of –</p> <ul style="list-style-type: none"> (iii) bridges exceeding 10 square metres in size; (vi) bulk storm water outlet structures exceeding 10 square metres in size; (viii) jetties exceeding 10 square metres in size; (ix) slipways exceeding 10 square metres in size; (x) buildings exceeding 10 square metres in size; (xii) infrastructure or structures with a physical footprint of 10 square metres or more; <p>where such development occurs</p> <ul style="list-style-type: none"> (a) within a watercourse; (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; <p>excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p> <p>(d) In KwaZulu-Natal:</p> <ul style="list-style-type: none"> i. In an estuarine functional zone; vii. Critical biodiversity areas or ecological support areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; 	<p>The construction of new supporting infrastructure exceeding 10 m² will be required within 32 m of a watercourse to accommodate crossing of the estuary near the proposed desalination plant. Construction activities associated with the temporary jetty will occur within 32 m of the Lovu estuary mouth.</p> <p>Bulk storm water systems and associated outlet structures at the alternative desalination plant site will be appropriately designed during the detailed design phase and may be located within 32 m of a watercourse. The construction of new buildings and supporting infrastructure exceeding 10 m² may be required within 32 m of a watercourse, if the Alternative site is chosen. Further investigation into these aspects of the proposed development will form part of the detailed engineering design phase.</p> <p>Such construction will occur outside urban areas in areas which have been identified as CBA by the EKZNW Terrestrial Systematic Conservation Plan and within 1 km of the high water mark (Pipelines).</p>

Listed activity as described in GN R544, R545 and R546	Listed activity as described in GN R983, R984 and R985	Description of project activity that triggers listed activity
	<p>viii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>x. Outside urban areas: (bb) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined.</p>	
<p>GN R546 Item 19 (a) (ii) (ii):</p> <p>The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre, (a) in the KwaZulu-Natal province, (ii) outside urban areas, in: (ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined.</p>	<p>GN R 984 Item 18 (d) (viii) (x):</p> <p>The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.</p> <p>(d) In KwaZulu-Natal: viii. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; x. Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose;</p>	<p>The proponent intends to use existing roads to access the proposed facility (pending approval from relevant authorities). However, existing roads may be required to be widened by more than 4 m, or lengthened by more than 1 km.</p> <p>The details will be confirmed as part of the detailed engineering design phase. The proposed project may require the construction of an access road to the proposed desalination plant. If required, this road would be located outside urban areas within an area which has been identified as CBA by the EKZNW Terrestrial Systematic Conservation Plan.</p> <p>The details will be confirmed as part of the detailed engineering design phase.</p>

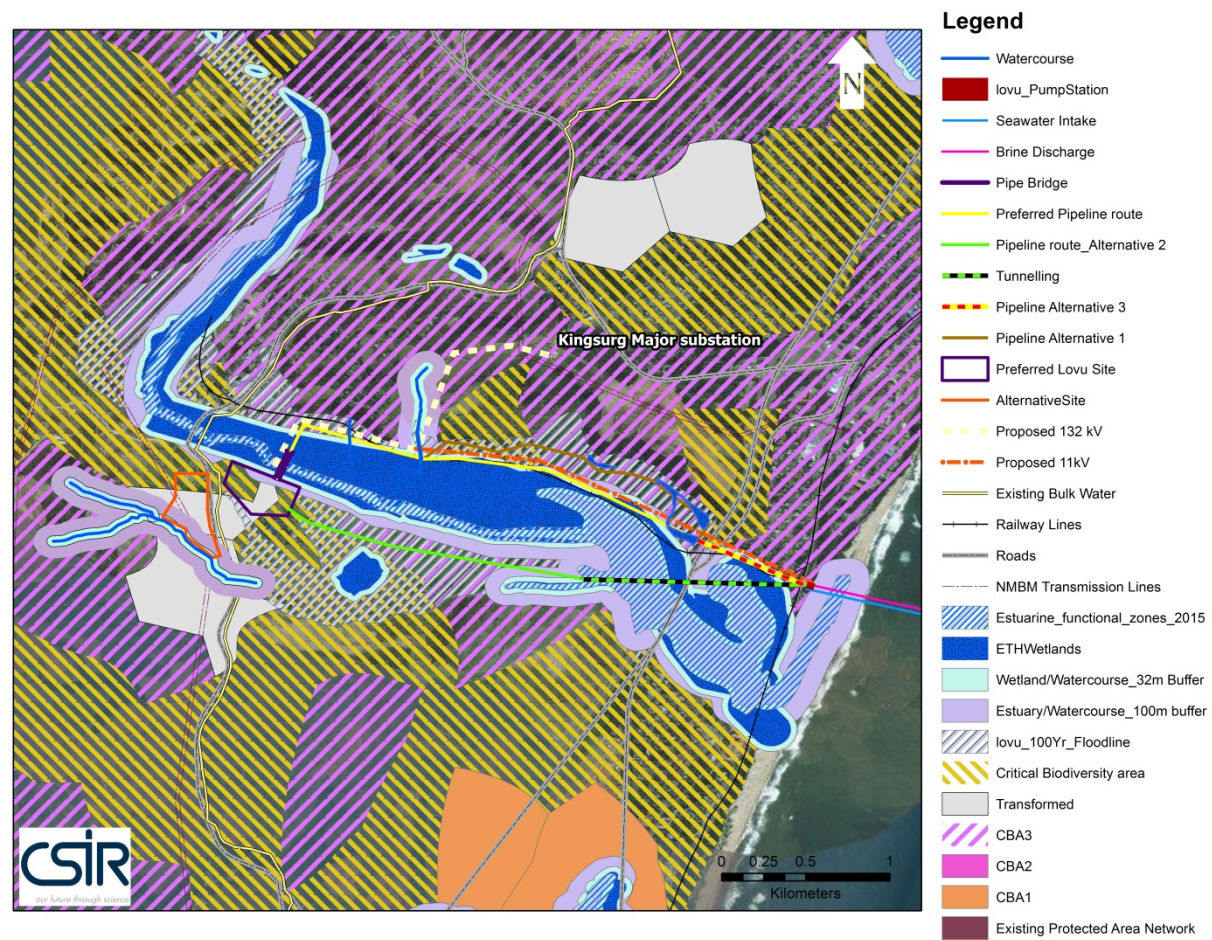


Figure 4.1 Critical Biodiversity areas identified by the EKZNW Terrestrial Systematic Conservation Plan and Watercourses buffers

4.2.1.4. National Environmental Management: Biodiversity Act (Act 10 of 2004)

The objective of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA) is to provide for the conservation of biological diversity, to 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).

4.2.1.5. National Environmental Management: Waste Act (Act 59 of 2008) (NEMWA)

The purpose of this Act is to reform the law regulating waste management in order to: a) protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development, b) to provide for institutional arrangements and planning matters; to provide for national norms and standards for regulating the management of waste by all spheres of government; c) to provide for specific waste management measures; d) to provide for the licensing and control of waste management activities; e) to provide for the remediation of contaminated land; to provide for the national waste information system; f) to provide for compliance and enforcement; g) and to provide for matters connected therewith.

Government Notice 921 (published on 29 November 2013) contains a list of waste management activities that have, or are likely to have, a detrimental impact on the environment. If any of the waste management activities are triggered in Category A and Category B of Government Notice 921, a Waste Management Licence is required. A Waste Licence, in terms of the NEMWA, is not required if any activities listed in Category C are triggered, however instead, compliance with the relevant National Norms and Standards must be achieved.

In general, the discharges from a desalination plant would include:

- concentrate (brine) from the SWRO membrane system;
- treated waste streams originating from the DAF clarifier (if such clarifier is used);
- spent backwash water from the pre-treatment system; and
- RO and spent (used) membrane cleaning solution, and post-flush water generated during CIP (cleaning in place)
- filter-to-waste water; and
- sludge from lime clarifiers (if lime is used for potabilisation purposes).

During the detailed feasibility study, it was established that the preferred waste stream option for full-scale project implementation is the disposal at sea of all desalination plant waste streams after their equalization and neutralization in the discharge retention tank and subsequent blending with the desalination plant concentrate (brine). This would amount to a maximum of 257 Ml/day discharged at sea and will eliminate the need for sludge and associated solid waste disposal to a landfill.

It is also important to note that small amounts of solid waste would be generated periodically (once every 3 to 4 weeks) from the operation of the plant intake screens. The amount of

screenings generated per month is expected to vary between 20 and 100 kg/month. These screenings would typically be disposed of at a landfill site once or twice per month. The solid waste would include plant cartridge filters and membrane elements. Based on the above, a Waste Licence is not likely to be required.

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

Regulation 6 makes provision for 7 categories under which a permit must be applied for before driving on the coast. However, driving on the coastal zone for the purposes of abstracting seawater is not provided for. To this end, a person driving on the coast with this purpose in mind must apply to the Minister for an exemption from complying with any of the requirements of the regulations. However, the minister shall only consider issuing an exemption if he/she is satisfied that granting such exemption:

- Will not result in harm to the coastal zone;
- Will not seriously affect any rights of the general public to enjoy the coastal zone;
- Is in the public interest; or
- Alternatively, in the interest of the environment.

4.2.1.7. National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008) (NEM: ICMA)

The sections of the NEM: ICMA (2008) specifically designed to deal with the leasing of state land in the coastal zone are provided for in the Act. The most applicable component of the NEM: ICMA (2008) 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 17;
- (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 Minister may, by notice in the Gazette list such activities requiring a permit or licence”.

The operation of the proposed desalination plant requires a Coastal Waters Discharge Permit in terms of the National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008) in order to permit the disposal and discharge of effluent to sea. An application for a Coastal Waters Discharge Permit has been submitted to the DEA Ocean and Coast on 14 September 2015.

4.2.1.8. 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.

4.2.1.9. 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.

4.2.1.10. National Environmental Management: Air Quality Act (Act 39 of 2004)

The aim of this act is to reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures.

4.2.1.11. 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.

4.2.1.12. Conservation of Agricultural Resources Act (Act 43 of 1983)

The objectives of the Conservation of Agricultural Resources Act 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.

Additional information regarding the applicability of this act is provided in the Terrestrial Ecology Assessment (Chapter 9 of this Final EIA Report).

4.2.1.13. 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).

4.2.1.14. Sea Birds and Seals Protection Act (Act 46 of 1973)

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

4.2.1.15. The National Heritage Resources Act (Act 25 of 1999)

The National Heritage Resources Act (Act 25 of 1999) introduces an integrated and interactive system for the managements 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.

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. Thus developers will be able to proceed without uncertainty about whether work will have to be stopped if a heritage resource is discovered.

During the Scoping Phase, the following parts of sections 35(4), 36(3) (a) and 38(1) (8) of the National Heritage Resources Act (Act 25 of 1999) were understood to apply to the proposed project:

Archaeology, palaeontology and meteorites:

Section 35 (4) No person may, without a permit issued by the responsible heritage resources authority:

- a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
- b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
- c) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

Burial grounds and graves:

Section 36. (3) (a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority:

- a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
- b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
- c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

Heritage resources management:

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorized as:

- a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- b) the construction of a bridge or similar structure exceeding 50 m in length;
- c) any development or other activity which will change the character of the site –
 - i. **exceeding 5000 m² in extent, or**
 - ii. involving three or more erven or subdivisions thereof; or
 - iii. involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - iv. the costs of which will exceed a sum set in terms of regulations by SAHRA, or a provincial resources authority;
- d) the re-zoning of a site exceeding 10 000m² in extent; or
- e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

Linked to the above, as noted in Chapter 1 of this Final EIA Report, a full Heritage Impact Assessment was originally planned to be undertaken during the EIA Phase by eThembeni Cultural Heritage. However, after a site investigation was undertaken by the heritage specialists on 23 February 2015 and 22 July 2015 (during the EIA Phase), it was established that the proposed site is of low sensitivity from all aspects of archaeological heritage. The Palaeosensitivity Map available on the South African Heritage Resources Information System (SAHRIS) indicates that the area has low to medium sensitivity. Furthermore, the specialist research indicated that fossil bearing strata occur well below the anticipated drilling depths and thus precludes any further palaeontological studies. Based on the findings of the site investigations and preliminary research undertaken by the heritage specialist, it was decided to request for an exemption from a full Heritage Impact Assessment for the proposed project. The findings of the specialist investigation is summarised below and included in Appendix E of this Final EIA Report:

- The proposed location of the desalination plant within the 1:100 year flood line of the Lovu River precludes the presence of archaeological sites as in the past people would not have chosen to reside within what would have been the periphery of a tidal marsh or at least, phragmites/ cyperus reed beds.
- The access servitudes for the pipeline through the coastal foreshore dunes and the immediate environments were red-flagged for the presence of shell middens. However, the site inspections revealed no evidence of such shell middens.
- Furthermore, the intertidal zone where the intake/outlet pipes are proposed is a sandy beach devoid of a rocky shoreline. Intertidal rocky outcrops occur 850 m north and 3 km south of the abstraction point which precludes the possibility of shell middens at this point.
- The remainder of the pipeline alternatives traverse, or are to be drilled through, a modified landscape (i.e. tarred roads, railway servitude and river floodplain), and as such no primary context archaeology can be anticipated.

As such, a letter of motivation for exemption from a full HIA has been drafted (as included in Appendix E of this Final EIA Report) and submitted to the Heritage Authority (Amafa/Heritage AKwaZulu-Natali) for approval and decision-making. A case file was also created for the proposed project and a copy of the letter was also loaded onto the SAHRIS on 05 October 2015. The SAHRIS Case Reference is 8447 and its status on SAHRIS is Closed (approved). An approval

letter a final Record of Decision from SAHRA (dated 8 December 2015) and from the Amafa/Heritage AKwaZulu-Natali (dated 20 October 2015) were received (refer to Appendix E).

4.2.1.16. The National Water Act (Act 36 of 1998)

One the important objectives of the National Water Act (NWA) (Act 36 of 1998) are 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.

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 and Sanitation (DWS).

Any activities that take place within a water course or within 500 m of a wetland boundary require a Water Use Licence in terms of the NWA. The need for a Water Use Licence is discussed in the Aquatic Ecology Assessment (Chapter 8 of this Final EIA Report). The DWS was consulted during the EIA Process (Pre-application meeting 17 November 2015) to confirm the need for a Water Use Licence and to seek comment on the proposed project. A WULA is being compiled for the relevant activities.

An estuary is not defined in the NWA as a "watercourse". An estuary is instead considered a "water resource". Furthermore, water uses under Section 21 (c) and (i) of the NWA regulate activities within a watercourse. For development within 500 m of the estuary, it is understood that a Water Use Licence Authorisation is not expected to be required as this is considered part of the intertidal zone (marine) and thus does not fall within the jurisdiction of the DWS. Comments from the DWS regarding this aspect will be solicited during the pre-application meeting.

4.2.1.17. 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).

Preparation and adoption of Water Services Development Plans (refer to Section 13 of the Act) by water services authorities that should form part of IDP's.

4.2.1.18. 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.

4.2.1.19. Relevant Health Legislation

The sale of seawater to local inhabitants needs to be of an exceptional standard in terms of chemical and biological compositions. The South African National Bureau of Standards will need to be contacted along with the Department of Health (either may have specific requirements). The WHO guidelines on desalination will be used to good effect in this instance.

4.2.1.20. The Development Facilitation Act (Act 67 of 1995)

The Development Facilitation Act 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.

4.2.1.21. The Planning and Development Act (Act 6 of 2008)

The planning and Development Act provides for the adoption, replacement and amendment of schemes, for the subdivision and consolidation of land; for the development of land outside schemes; for the phasing or cancellation of approved layout plans for the subdivision or development of land; for the alteration, suspension and deletion of restrictions relating to land; for provincial planning and development norms and standards; and to provide for matters connected therewith. This Act also establishes general principles for the permanent closure of municipal roads or public places.

4.2.1.22. Potential eThekweni Municipal By-Laws

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

4.2.2. International Conventions

4.2.2.1. 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

4.2.2.2. Convention on the Prevention of Marine Pollution by Dumping of Waste and Other Matter, 1972 (as amended) (London Convention)

The London Convention 1972 is an international treaty that limits the discharge of waste that is 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 (Act 73 of 1980) gives legal status to the London Convention in South Africa.

4.2.2.3. *The United Nations Convention on the Law of the Sea, 1992 (UNCLOS)*

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.

4.2.2.4. *Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA), 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.

4.2.2.5. *Convention on Biological Diversity, (CBD) 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 (Act 10 of 2004).

4.2.2.6. *Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa, 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.

4.2.2.7. *Convention on Wetlands of International Importance especially as Waterfowl Habitat, 1971 (Ramsar Convention)*

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.

4.2.2.8. *Convention of Migratory Species of Wild Animals, 1979 (Bonn Convention)*

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 Palearctic (birds) and the Antarctic species (whales and birds). South Africa acceded to the Convention in December 1991.

4.2.2.9. *The Abidjan Convention, 1981 and 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).

4.2.2.10. *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 co-operate 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.

4.2.2.11. Agenda 21, 1992 as reaffirmed at the United Nations World Summit on Sustainable Development – 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.

4.2.2.12. National and International Guidelines

- Guidelines published in terms of the NEMA EIA Regulations, in particular:
 - Guideline on Transitional Arrangements (DEA&DP, October 2011)
 - Guideline on Alternatives (DEA&DP, October 2011)
 - Guideline on Public Participation (DEA&DP, August 2011)
 - Guideline on Need and Desirability (DEA&DP, August 2011)
 - Guideline on Generic Terms of Reference for EAP's and Project Schedules (DEA&DP, October 2011)
- 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 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 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 (NPA) for the Protection the Marine Environment from Land-Based Activities, 2008
- Benguela Current Large Marine Ecosystem (BCLME), 2008

Other Acts, standards and/or guidelines which may also be applicable have been reviewed in more detail as part of the specialist studies, which are included in Chapter 6 to Chapter 12 of this Final EIA Report.

4.3. ENVIRONMENTAL AUTHORISATIONS REQUIRED FOR THE DEVELOPMENT

The environmental scope of a large-scale desalination EIA is extremely broad as there a number of diverse development components such as sea pipelines, terrestrial pipelines, marine intakes and outfalls, electrical infrastructure and others. This creates a complex legal environment where a number of legal permissions, licenses, permits and authorisations are required from a number of different Provincial and National governmental departments. At this stage it is the understanding of the EAP that any number of Environmental Authorisations will be required, as indicated in Table 4.2.

Table 4-2 Environmental Authorisation requirements for the proposed Lovu desalination development

Type of Authorisation Required	Competent Authority	Reason for Authorisation
The National Environmental Management Act (No. 108 of 2008) General Environmental Authorisation.	National DEA	The aforementioned listed activities require full Scoping and Environmental Impact Reporting (S&EIR) in terms of GN R545, and include basic assessments required for activities listed in GN.R544 and GN.R546.
Integrated Coastal Management Act (No. 24 of 2008). Coastal Waters Discharge Permit.	National DEA: Branch Oceans and Coasts	A concentrate solution with additional chemical constituents will be discharged into the sea.
Servitudes for pipelines that traverse state owned land above the high water mark need to be applied for by Umgeni Water.	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.	National DEA: Branch Oceans and Coasts	The development of the pipelines traversing the sea shore will require an ORV licence in accordance with Regulation 1399. One can gain exemption from complying with the permit application if the proposed development is in the public interest.
A Permit to remove rare plant species if present.	Department of Agriculture and Environmental Affairs.	Rare and endangered plant species may need to be relocated for the siting of the actual desalination plant and the associated pipelines. Authorisation to undertake this activity will need to be obtained from the Competent Authority.
National Water Act (No. 36 of 1998) Water Use License Application (WULA).	Department of Water and Sanitation: KwaZulu-Natal	The proposed terrestrial pipelines and powerline will traverse water resources such as rivers and wetlands and will be within 500 m of a wetland (Refer to Chapter 8). Clarity on this requirement was sought from KwaZulu-Natal Water Affairs during a pre-application meeting on 17 November 2015.

4.4. PUBLIC PARTICIPATION PROCESS

The key steps in the public participation process for the EIA Phase are described below. This approach has been confirmed with the DEA through their approval of the Plan of Study for EIA. In line with this, the Final Scoping Report was submitted to the DEA on 23 February 2015 for decision-making and concurrently released to I&APs for a 21-day review period. The DEA accepted the Final Scoping Report on 30 April 2015, and a copy of the acceptance letter is included in Appendix C of this report. The participation process for the Scoping Process is described in Chapter 4 of the Final Scoping Report for this project (CSIR, 2013).

All I&APs on the project database were notified in writing, via Letter 3 dated 23 February 2015, of the submission of the Final Scoping Report and the corresponding 21-day comment period. A copy of this correspondence is attached as Appendix F of this report. Comments received from I&APs during the 21-day comment period on the Final Scoping Report are also included in the Comments and Responses Trail in Chapter 5 of this EIA Report. Copies of the detailed comments received are included in Appendix F of this report.

Task 1: Draft EIA Report and EMPr

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

- **Advertisements** – placed in provincial newspapers (i.e. The Mercury and The Isolezwe on 4 November 2015) advertising the availability of the Draft EIA Report for review as well as providing details of the public meeting to be held;
- **Correspondence to I&APs** – All registered I&APs (including authorities) on the project database (95 I&APs) were notified in writing via Letter 4 of the 40-day public review period for the Draft EIA Report and were invited to attend the public meeting (this letter included the Executive Summary of the Draft EIA Report and a Comment Form);
- A **Public Meeting** on the Draft EIA Report was held, where key findings of the Draft EIA Report were communicated and I&APs had the opportunity to provide comments and engage with the EIA team and project proponent. All registered I&APs were invited to attend this public meeting, as noted above, via Letter 4;
- A **Focus Group Meeting** with Mother Of Peace was held during the review of the Draft EIA Report. The purpose of this meeting was to proactively invite them to attend a meeting where they are provided with an overview of the project and key findings of the Draft EIA Report.

The Draft EIA Report and Draft EMPr were made available and distributed through the following mechanisms to ensure access to information on the project and to communicate the outcome of specialist studies:

- Copies of the report was placed at the Kingsburgh Local Library;
- Relevant organs of state and key I&APs were provided with a hard copy of the report or a CD; and
- The report was placed on the project website: <http://www.csir.co.za/eia/LovuDesalination/>

In terms of the electronic database, I&AP details are captured and automatically updated as and when information is distributed to or received from I&APs. This on-going and up-to-date record of communication is an important component of the public participation process. It must be noted that while not required by the regulations, those I&APs proactively identified at the outset of the Scoping Process will remain on the project database throughout the EIA Process and will be kept informed of all opportunities to comment and will only be removed from the database by request. A copy of the I&AP database is included as Appendix F of this EIA Report.

Given the end of the year festivities, the commenting period on the Draft EIA report was **extended** to 31 January 2016, to ensure that all I&APs had sufficient time to send their comments. All I&APs were informed of this extension of the commenting period via Letter 5 (post and email) and **adverts** were placed in additional newspapers The Sun on 4 December 2015 and the Illanga on 3 December 2015.

Task 2: Comments and Responses Trail

A key component of the EIA Process is documenting and responding to the comments received from I&APs and the authorities. The following comments on the Draft EIA Report and EMPr were documented:

- Written and email comments (e.g. letters and completed comment forms);
- Comments made at public meetings;
- Comments made at focus group meetings;
- Telephonic communication with CSIR project team; and
- One-on-one meetings with key authorities and/or I&APs.

The comments received during the review of the Draft EIA Report were compiled into a Comments and Responses Trail and included in the Final EIA Report. The Comments and Responses Trail indicates the nature of the comment, as well as when the comment was submitted and who raised the comment. The comments received are considered by the EIA team and appropriate responses provided by the relevant member of the team and/or specialist. The response provided indicates how the comment received has been considered in the Final EIA Report, in the project design or EMPr for the project. Comments made at the public meeting were also be kept and inserted as an appendix in the Final EIA Report.

As noted above, comments that have been received from I&APs during the 21-day comment period on the Final Scoping Report and prior to the review of the Draft EIA Report are also included in the Comments and Responses Trail in Chapter 5 of this EIA Report. Copies of the detailed comments received are included in Appendix F of this EIA Report.

Task 3: Review of Final EIA Report – Current Stage

As noted in Task 2 above, the Final EIA Report was compiled subsequent to the 40-day review of the Draft EIA Report and all comments received from I&APs during this period have been recorded in the report and addressed where applicable. This Final EIA Report has been released to I&APs and submitted to the Competent Authority.

The DEA correspondence of acceptance of the Final Scoping Report, dated 30 April 2015 and included in Appendix C of this EIA Report, states the following regarding the timeframes for submission of the Final EIA Report:

- *“The applicant is hereby reminded to comply with the requirements of Regulation 67 with regard to the time period allowed for complying with the requirements of the Regulation, and regulations 56 and 57 with regard to the allowance of a comment period for interested and affected parties on all reports submitted to the competent authority for decision-making. The reports referred to are listed in regulation 56(3a – 3h)”.*

Regulation 56 (2) and 56 (6) of the 2010 EIA Regulations states the following:

- (2) *“Before the EAP managing an application for environmental authorisation submits a final report compiled in terms of these Regulations to the competent authority, the EAP must give registered interested and affected parties access to, and an opportunity to comment on the report in writing”.*
- (6) *“Registered interested and affected parties must submit comments on final reports contemplated in subregulation (3) to the competent authority and provide a copy of such comments to the applicant or EAP”.*

In line with the above, the Final EIA Report, including the Comments and Responses Trail and EMPr, is made available to all registered I&APs for a 21 day review period during which I&APs are able to comment on the changes made to the Final EIA Report since the release of the Draft EIA Report. Letter 6 was sent to all I&APs on the project database notifying them of the release and submission of the Final EIA Report. In line with Regulation 56 (6) of the 2010 EIA Regulations, any comments raised during this 21-day comment period by I&APs need to be sent directly to the DEA Case Officer, with a copy submitted to the EAP.

Furthermore, any comments received during the 21-day review period will be compiled into a Comments and Responses Trail (as a separate appendix to the Final EIA Report) by the EAP for submission to the authorities, with a cover letter.

The Final EIA Report is distributed as follows:

- Copies of the report is placed at the Kingsburgh Local Library.
- Relevant organs of state and key I&APs have been provided with a hard copy or CD version of the report.
- The report was placed on the project website: <http://www.csir.co.za/eia/LovuDesalination/>

The following comments on the Final EIA Report and EMPr will be documented:

- Written and email comments (e.g. letters and completed comment forms); and
- Telephonic communication with CSIR project team.

Task 4: Environmental Authorisation and Appeal Period

All registered I&APs on the project database will receive notification of the outcome of the decision making process and the issuing of the Environmental Authorisation (should such an authorisation be granted) and the appeal period. Regulation 10 (2) of the 2010 NEMA Regulations (i.e. GN R543) stipulates that “the applicant must, in writing, within 12 days of the date of the decision on the application notify all registered interested and affected parties of (i) the outcome of the application; and (ii) the reasons for the decision”.

Therefore all registered IA&Ps need to be informed about the outcome of the environmental decision, the reasons for the decision and information regarding the appeal procedure and its respective timelines.

Regulation 10 (2) of the National Appeal Amendment Regulations (published on 12 March 2015 in GN 205), states that:

- (2) “An appeal lodged after 8 December 2014 against a decision taken -
 - (a) in relation to a waste management license or integrated in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), which followed the processes in the regulations referred to in paragraph (b) and (c);
 - (b) in terms of the Environmental Impact Assessment Regulations, 2006; or
 - (c) in terms of the Environmental Impact Assessment Regulations, 2010,

must despite the repeal of the regulations referred to in paragraphs (b) and (c) be dispensed with in terms of the Environmental Impact Assessment Regulations, 2010 as if those regulations have not been repealed: Provided in the instance where a decision was taken after 8 December 2014, but prior to the publication of the National Appeal Amendment Regulations, 2015, and the applicant was informed in such decision to follow a different appeal process than the process indicated in sub-regulation (2), the appeal process indicated in such decision must be followed, unless otherwise informed by the relevant appeal authority”.

Therefore, should an Environmental Authorisation be granted by the Competent Authority for this proposed project and should an appeal be lodged by any person with regards to the decision, such an appeal will be lodged after the commencement of the 2014 National Appeal Amendment Regulations, and as such will be processed in terms of the 2010 EIA Regulations. As such, should an Environmental Authorisation be granted by the Competent Authority for this proposed project, the Applicant will duly notify I&APs of the decision in line with Regulation 10 (2) of the 2010 EIA Regulations (i.e. GN R543) (as explained above and below).

In terms of the 2010 EIA Regulations (i.e. GN R543), I&APs have to lodge their intent to appeal within 20 days of the date of the environmental decision. I&APs then have to submit their appeal within 30 days. The following process will be followed for the distribution of the Environmental Authorisation and notification of the appeal period:

- Copies of the Environmental Authorisation will be placed at the Kingsburgh Local Library;

- A notice will be published in the two newspapers that were used during the Public Participation Process in order to notify I&APs of the Environmental Authorisation;
- Letter 7 will be sent to all I&APs (including organs of state), with a copy of the relevant sections of the Environmental Authorisation and information on the Appeal Period; and
- The Environmental Authorisation will be placed on the project website: <http://www.csir.co.za/eia/LovuDesalination/>.

All I&APs on the project database will be notified of the outcome of the appeal period, this notification will be included in a newspaper advert and Letter 8 to I&APs.

4.5. AUTHORITY CONSULTATION DURING THE EIA PHASE

Authority consultation is integrated into the public consultation process, with additional one-on-one meetings held with the lead authorities where necessary. It is proposed that the Competent Authority (i.e. the DEA) as well as other lead authorities will be consulted at various stages during the EIA Process. Table 4.3 below indicates the proposed consultation schedule for the EIA Phase.

Table 4-3 Authority communication schedule

Stage in EIA Phase	Form of Consultation
During the EIA Process	Offer a site visit for authorities, as and when required.
During preparation of the Draft EIA Report and EMPr	Communicate with the DEA, discussing the outcome of the Draft EIA Report, EMPr, and specialist studies.
On submission of the Final EIA Report and Draft EMPr	Meetings with dedicated departments, if requested by the DEA, with jurisdiction over particular aspects of the project (e.g. Local Authority) and potentially including relevant specialists.

4.6. SCHEDULE FOR THE EIA

The proposed schedule for the EIA based on the legislated EIA Process (2010 EIA Regulations) is shown in Table 4.4. It should be noted that this schedule could be revised during the EIA Process.

Table 4-4 Environmental Impact Assessment Schedule for the Umgeni Water Lovu Desalination Facility

Tasks	EIA SCHEDULE (MONTHS)																													
	2013 Dec	2014 Mar	2014 April	2014 May	2014 Jun	2014 Jul	2014 Aug	2014 Sep	2014 Oct	2014 Nov	2014 Dec	2015 Jan	2015 Feb	2015 Mar	2015 Apr	2015 May	2015 Jun	2015 Jul	2015 Aug	2015 Sep	2015 Oct	2015 Nov	2015 Dec	2016 Jan	2016 Feb	2016 Mar	2016 Apr	2016 May	2016 June	2016 July
1. Notify authorities and submit EIA Application	█																													
2. Establish I&AP database, prepare BID and announce EIA	█	█																												
3. I&AP registration and meetings with key stakeholders to source issues		█	█																											
4. Prepare Draft Scoping Report (DSR) and Plan of Study for EIA (PSEIA)				█	█	█	█	█																						
5. Public comments period (40 days) on DSR and stakeholder meetings								█	█																					
6. Submit Final Scoping Report (FSR) and PSEIA to authorities for decision (30 days) and I&AP comment period (21 days)													█	█	█															
7. Specialist studies (including fieldwork)													█	█	█	█	█	█	█	█										
8. Prepare Draft EIA Report and EMP																		█	█											
9. Public review of Draft EIA Report and EMP (40 days)																					█	█	█							
10. Submit Final EIA Report and Draft EMP to authorities																											█			
11. Decision by authorities																												█	█	█
12. Appeal process																														→

4.7. APPROACH TO IMPACT ASSESSMENT AND SPECIALIST STUDIES

This section outlines the assessment methodology and legal context for specialist studies, in accordance with Section 3: Assessment of Impacts, in DEAT Guideline 5, June 2006.

4.7.1. Generic Terms of Reference for the Assessment of Impacts

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

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

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

As per DEAT *Guideline 5: Assessment of Alternatives and Impacts* the following methodology has been applied to the predication and assessment of impacts. Potential impacts have been rated in terms of the direct, indirect and cumulative (where applicable in the relevant specialist studies):

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

- National; and
- International (important for migrant birds).

Each spatial extent rating as described above is provided with a relevant score, as shown in Table 4.5 below.

Table 4-5 Ratings and Scores for Spatial Extent

	Rating	Score
Spatial Extent Description	Site specific	1
	Local (<2 km from site)	2
	Regional (within 30 km of site)	3
	National	4
	International/Global	5

- **Intensity** – The anticipated severity of the impact (i.e. whether the impact is potentially destructive or innocuous) is described as either:
 - Negative Impacts:
 - Very High (irreversible human health damage (morbidity/mortality); and loss of species (fauna and/or flora));
 - High (severe alteration of natural systems, patterns or processes);
 - Medium (notable alteration of natural systems, patterns or processes); and
 - Low (negligible alteration of natural systems, patterns or processes).
 - Positive Impacts:
 - High (potential net improvement to human welfare);
 - Medium (potential to improve environmental quality and individual livelihoods); and
 - Low (potential positive change with no other consequence).

Each intensity rating (both positive and negative) as described above is provided with a relevant score, as shown in Table 4.6 below.

Table 4-6 Ratings and Scores for Intensity

Potential Intensity Description (negative)	Rating	Score
Potential to severely impact Human Health (morbidity/mortality); or to lead to Loss of species ¹ (fauna and/or flora)	Very High/Fatal Flaw	16
Potential to reduce faunal/flora population or to lead to severe reduction/alteration of natural process, loss of livelihoods or severe impact on quality of life ² , individual economic loss	High	8
Potential to reduce environmental quality – air, soil, water.	Medium	4

¹ Note that a Loss of species is a global issue and is differentiated from a loss of “flora/fauna” population

² Note that a visual impact or air emissions for example could be considered as severely impacting on quality of life should it constitute more than a nuisance but not being life threatening

Potential Loss of habitat, loss of heritage, reduced amenity		
Nuisance	Medium-Low	2
Negative change – with no other consequence	Low	1
Potential Intensity Description (positive)	Rating	Score
Potential Net improvement in human welfare	High	8
Potential to improve environmental quality – air, soil, water. Improved individual livelihoods	Medium	4
Potential to lead to Economic Development	Medium-Low	2
Potential positive change – with no other consequence	Low	1

Note that the concept of “**irreplaceable loss of a resource**” is to be taken into account in the Potential Intensity score of an impact

- **Duration** – The timeframe during which the impact will be experienced:
 - Temporary (less than 2 year);
 - Short term (2 to 6 years);
 - Medium term (6 to 15 years);
 - Long term (the impact will cease after the operational life of the activity); and
 - Permanent (mitigation will not occur in such a way or in such a time span that the impact can be considered transient).

The concept of “reversibility” is reflected in the duration scoring. I.e. the longer the impact endures the less likely it will be reversible. Each duration rating as described above is provided with a relevant score, as shown in Table 4.7 below.

Table 4-7 Ratings and Scores for Duration

Duration Description	Score
Temporary (less than 2 year) or duration of the construction period. This impact is fully reversible. <i>E.g. the construction noise temporary impact that is highly reversible as it will stop at the end of the construction period</i>	1
Short term (2 to 5 years). This impact is reversible.	2
Medium term (5 to 15 years). The impact is reversible with the implementation of appropriate mitigation and management actions.	3
Long term (> 15 years but where the impact will cease after the operational life of the activity). The impact is reversible with the implementation of appropriate mitigation and management actions. <i>E.g. the noise impact caused by the desalination plant is a long</i>	4

<i>term impact but can be considered to be highly reversible at the end of the project life, when the project is decommissioned</i>	
Permanent (mitigation will not occur in such a way or in such a time span that the impact can be considered transient). This impact is irreversible. <i>E.g. The loss of a palaeontological resource on site caused by construction activities is permanent and would be irreversible.</i>	5

- **Reversibility** – The “reversibility” of the environmental impacts of the proposed development after project cessation or decommissioning (‘High’ representing a ‘positive’ value and ‘Low’ representing a ‘negative’ value):
 - High (the alteration of natural systems can be reversed to an extent that represents similar or better environmental conditions, pre-development - through rehabilitation);
 - Medium (alteration of natural systems can be reversed to some extent); and
 - Low (it is unlikely that the alteration of natural systems can be reversed).

The concept of “reversibility” has been taken into consideration in the duration scoring, as shown in Table 4.7 above (i.e. the longer the impact endures the less likely it will be reversible).

- **Irreplaceability** – The “replaceability” of the of natural characteristics in the area that may be impacted upon the proposed development (i.e. the degree to which the impact causes irreplaceable loss of resources assuming that the project has reached the end of its life cycle (decommissioning phase)):
 - High (high irreplaceability means that the opportunity to replace or restore systems that are affected by the proposed development will be in very short supply and the site will not recover to its original state);
 - Medium (alteration of natural systems, patterns or processes may be able to be replaced)
 - Low (the site does most likely not represent a particularly sensitive system and can be replicated or replaced).

The concept of “irreplaceable loss of a resource” has been taken into consideration in the potential intensity score of an impact (as shown in Table 4.6 above).

Using the criteria above, the impacts have been further assessed in terms of the following:

- **Probability** –The probability or likelihood of the impact occurring:
 - Improbable (little or no chance of occurring);
 - Low Probability (10 - 25% chance of occurring);
 - Probable (25 - 50% chance of occurring);
 - Highly probable (50 – 90% chance of occurring); and
 - Definite (greater than 90% chance of occurring).

Each probability rating as described above is provided with a relevant score, as shown in Table 4.8 below.

Table 4-8 Ratings and Scores for Probability

Probability Description	Score
Improbable (little or no chance of occurring <10%)	0.1
Low Probability (10 - 25% chance of occurring)	0.25
Probable (25 - 50% chance of occurring)	0.5
Highly probable (50 – 90% chance of occurring)	0.75
Definite (>90% chance of occurring).	1

- **Significance** – Will the impact cause a notable alteration of the environment?
 - Low to very low (the impact may result in minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making);
 - Medium (the impact will result in a moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated);
 - High (the impacts will result in a major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making); and
 - Fatally flawed (The project cannot be authorised unless major changes to the engineering design are carried out to reduce the significance rating).

The significance is determined through a combination of the abovementioned impact characteristics. The total number of points scored for the potential intensity, duration and extent (referred to as “impact magnitude”) is multiplied by the probability scores in order to indicate the level of significance of the impacts (i.e. the significance ratings). The formula for the impact significance ratings is indicated in Table 4.9 below.

Table 4-9 Impact Significance Calculation

Significance Rating =	Impact Magnitude * Probability
Impact Magnitude =	Potential Intensity Score + Duration Score + Extent Score

Once the overall significance rating is calculated for each impact as described above, it then is provided with a relevant score, as shown in Table 4.10 below.

Table 4-10 Ratings and Scores for Overall Impact Significance

Significance Rating	Significance Rating	Score
The project cannot be authorised unless major changes to the engineering design are carried out to reduce the significance rating.	Fatally flawed	18-26
The impacts will result in major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making.	High	10-<18
The impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated.	Medium	5-<10
The impact may result in minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making.	Low	2-<5
The impact may result in very minor alterations of the environment and can be avoided through the implementation of mitigation measures.	Very Low	<2

- **Status** - Whether the impact on the overall environment will be:
 - Positive - environment overall will benefit from the impact;
 - Negative - environment overall will be adversely affected by the impact; and
 - Neutral - environment overall not be affected.

- **Confidence** – The degree of confidence in predictions based on available information and specialist knowledge:
 - Low;
 - Medium; and
 - High.

- **Management Actions and Monitoring of the Impacts (EMPr)**
 - Where negative impacts are identified, mitigatory measures are provided to avoid or reduce negative impacts. Where no mitigatory measures are possible this has been stated (as applicable);
 - Where positive impacts are identified, measures are provided to potentially enhance positive impacts; and

- Quantifiable standards for measuring and monitoring mitigatory measures and enhancements have been set as applicable. This includes a programme for monitoring and reviewing the recommendations to ensure their ongoing effectiveness.

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

- Impacts have been evaluated for the construction and operation phases of the development. The assessment of impacts for the decommissioning phase is generally brief, as there is limited understanding at this stage of what this might entail. The relevant rehabilitation guidelines and legal requirements applicable at the time will need to be applied;
- The impact evaluation has, where possible, taken into consideration the cumulative effects associated with the proposed project and other facilities/projects which are either developed or in the process of being developed in the local area; and
- Impacts have been described both before and after the implementation of the proposed mitigation and management measures. The scenario “without mitigation” considers all management actions already proposed by the proponent as part of the project description. “With mitigation” assesses the significance rating of the potential impact, taking into account any additional management actions recommended by the specialist.
- Linked to the above, for each impact assessment, mitigation measures are generally listed under the following three categories (as applicable):
 - Mitigation measures inherent to the project design (i.e. mitigation/management actions that the proponent had planned to implement as part of the project description);
 - Key management actions proposed by specialist (pertinent measures that will be written into, and enforced through the EMPr for implementation to ensure that the significance of the associated impact is acceptable); and
 - Additional management actions proposed by the specialist (management actions to be considered by proponent and authority).
- The impact assessment has attempted to quantify the magnitude of potential impacts (direct and cumulative effects) and outline the rationale used. Where appropriate, national standards are used as a measure of the level of impact.

Table 4.11 below has been used by specialists for the rating of impacts.

Table 4-11 Table for Rating of Impacts for the proposed Umgeni Water Lovu Desalination Plant (Example)

Impact Description	Status (Negative or Positive)	Spatial Extent	Duration	Reversibility	Potential Intensity	Probability	Significance (Without Mitigation)	Key Management actions (i.e. actions that are not negotiable and have to be implemented to ensure that the significance of the associated impact is acceptable)	Significance (With Mitigation)	Confidence
Construction Phase										
Alternative 1										
Scenario 1: Vegetation loss during construction										
Nuisance due to dust emissions resulting from construction activities (Direct Impact) Mitigation measures inherent to the project design: <ul style="list-style-type: none"> • Access to the construction site will be limited to construction vehicles only; and • Vehicle speed restrictions will be imposed on the construction site. 	Negative	Local (2)	Short-Term (2)	High	High (8)	Probable (0.5)	Medium (6)	Loads on vehicles carrying dusty construction materials should be covered.	Low (3)	High

4.8. POTENTIAL ISSUES AND TERMS OF REFERENCE FOR THE SPECIALIST STUDIES

The specialist studies may be modified after the Scoping process has been concluded to include aspects raised by I&APs. No additional studies were deemed necessary at the conclusion of the Scoping Phase. The specialist studies undertaken during the EIA Phase, as noted in the Scoping Reports, are listed in Table 4.12 below.

Table 4-12 Specialist Studies proposed as part of the Umgeni Water Lovu desalination EIA

Specialist and Organisation	Specialist Study	Specialist Expertise
Dr Andrea Pulfrich Pisces Environmental Services (Pty) Ltd	Marine Ecology	Ph.D. Fisheries Biology. She is a member of the South African Council for Natural Scientific Professions (SACNASP). She has more than 26 years of experience in marine ecology and has been party to a number of specialist studies including desalination plants (e.g. NamWater and Areva, Namibia) that have that have been undertaken on the west coast of southern Africa.
Simon Bundy Sustainable Development Projects CC	Terrestrial Ecology	M.Sc. Marine and Coastal Management. Simon is a professional ecologist registered with the SACNASP. Simon Bundy has been involved in environmental and development projects and programmes since 1991. With a core competency in coastal ecology and coastal management, Simon has worked on coastal projects in the Seychelles and Tanzania providing ecological and general environmental advice and support. Within South Africa, Simon has been involved in a number of large coastal projects including residential estates, infrastructure and linear developments in KwaZulu-Natal, Eastern Cape and Western Cape. In such projects Bundy has provided both technical ecological support, as well as the undertaking of EIAs.
Liz Day The Freshwater Consulting Group	Aquatic Ecology (Freshwater Resources)	Ph.D. Zoology and registered with the SACNASP for fields of Biological Science, Ecological Science and Zoological Science. Liz has over 12 years of experience in aspects of aquatic ecology, specialising in urban river and wetland management and rehabilitation; urban stormwater design with respect to freshwater ecosystems; water quality; EIAs; baseline and situation assessments; SASS5 biomonitoring; catchment and river management plans; urban river and wetland mapping and biodiversity planning. Additionally, Liz has compiled over 200 specialist wetland/riparian ecology technical reports, 7 scientific papers (5 in international literature), and 20 popular biological articles published in local environmental magazines, scripts for eight environmental documentaries.
Steven Weerts and Shamilla Pillay CSIR	Estuarine Ecology	Steven is a marine and estuarine ecologist. He has been employed directly in the broad field of marine and estuarine ecology for 20 years. During that period he has undertaken both academic and applied research work as well as consultancy projects. Steven has worked extensively on subtropical coastal aquatic systems of KwaZulu-Natal, including coastal plain rivers; all represented estuary types (temporarily open/closed, permanently open, river mouths and estuarine lakes), harbours and the marine continental shelf. This work has been in applied biophysical fields of water quality- and biological monitoring, ecological health, assessment of impacts of development and pollutants, and determination of freshwater

Specialist and Organisation	Specialist Study	Specialist Expertise
		<p>requirements. Steven's most recent marine monitoring work has included involvement in- and project leading of large scale programmes aimed at assessing potential impacts of major national infrastructural developments along the South Africa coast.</p> <p>Shamilla is an Ecologist and Researcher (Ecologist) at the CSIR and specialises in Ecology, Water Quality & Toxicity Testing. Shamilla has undertaken several specialist studies, particularly including specialist research on spills and fish kills within ports. She is also involved in developing an Importance Rating for the estuaries of KZN based on botanical and productivity value.</p>
Brett Williams Safetech (Pty) Ltd	Noise Impact Assessment	Ph.D. Health and Safety. Brett has consulted with many different industries including, mining, chemical, automotive, food production etc. He is registered with the Department of Labour and Chamber of Mines to measure environmental stressors, which include chemical monitoring, noise and other physical stresses.
Henry Holland Private	Visual Impact Assessment	M.Sc. Geology. Henry is a visual specialist who has done visual studies for several industrial developments, utilising GIS and computer simulation skills in his work.
Dr Hugo van Zyl Independent Economic Researchers	Socio-economic and Planning Assessment	Ph.D. Economics. Hugo has been involved in over 50 appraisals of infrastructure projects, industrial developments, land use changes, conservation projects and eco-tourism initiatives throughout Southern Africa.
Len van Schalkwyk eThembeni Cultural Heritage	Archaeology	M.A. Archaeology. ASAPA and Amafa aKwaZulu-Natali professional accreditation. Len has more than 25 years of professional experience as a practising archaeologist and heritage resource manager in South Africa, Botswana and Mozambique. His research interests have focussed on the Iron Age of southern Africa, while his management specialisations are heritage impact assessments, community liaison and ancestral grave management.

The Terms of Reference for the specialist studies essentially consist of the generic assessment requirements and the specific issues identified for each study. These issues have been identified through the baseline studies, I&AP and authority consultation, as well as input from the proposed specialists based on their experience. As part of the review of the Draft and Final Scoping Reports, specialists also proposed additional issues for inclusion in the specialist studies. Additional issues, identified through public and authority consultation during the Scoping Phase, as well as specialist inputs, were included in the final Terms of Reference for specialists (i.e. in the Plan of Study for EIA of the Final Scoping Report).

It is also important to highlight that the following recommendations/requests (Table 4.13) were made by the DEA in terms of potential impacts, as part of the acceptance of the Final Scoping Report and Plan of Study for EIA (Appendix C) in April 2015.

Table 4-13 DEA Recommendations for Assessment in the Final EIA Report

Recommendations from the DEA	Section where this is addressed in the Final EIA Report
<ul style="list-style-type: none"> ▪ The impacts of the proposed facility on marine ecology must be assessed in the EIA Phase. Similar existing projects must be taken into consideration in the EIA Report, when assessing the potential impacts of the return brine on the marine environment. 	<p>As noted in the Final Scoping Report, a Marine Ecology Assessment specialist study has been commissioned for the proposed project, and it is included in Chapter 6 of this Draft EIA Report. The Marine Ecology Assessment has assessed the impact of brine discharge on the marine environment. Where applicable, research and literature for similar desalination plants, have informed the impact assessment phase.</p>
<ul style="list-style-type: none"> ▪ The potential impacts of the proposed development on nearby natural coastal and/or dune forest(s) must be assessed, as per the correspondence from DAFF dated 29 October 2014. 	<p>A Terrestrial Ecology Assessment (Chapter 9), Estuarine Ecology Assessment (Chapter 7) and Aquatic Ecology Assessment (Chapter 8) has been undertaken as part of the EIA Phase, and therefore does assess the potential impact of the proposed development on the nearby coastal and dune forests (as applicable).</p>
<ul style="list-style-type: none"> ▪ Issues regarding the geotechnical stability of the proposed route 1 rising main pipeline must be addressed in the EIA Report, as per the eThekweni Municipality's comments dated 26 May 2014; 	<p>A Geotechnical Investigation was commissioned by the project Applicant as part of the Feasibility Phase. A summary of the findings of this investigation has been included in Chapter 2 of this Final EIA Report in order to assess the issues raised regarding geotechnical stability.</p>
<ul style="list-style-type: none"> ▪ Possible impacts and effects of the proposed development on the surrounding industrial, residential and holiday/tourist areas must be addressed; 	<p>These impacts are addressed, where relevant, in the Noise Impact Assessment (Chapter 11), Visual Impact Assessment (Chapter 10), and the Socio-Economic Assessment (Chapter 12).</p>
<ul style="list-style-type: none"> ▪ The EIA Report must include information on the following: <ul style="list-style-type: none"> ○ Environmental costs vs benefits of the reverse osmosis plant activity; and ○ Economic viability of the facility to the surrounding area and how the local community will benefit. 	<p>This is provided in the Socio-Economic Assessment (Chapter 12).</p>

4.8.1. Marine Ecology Assessment

4.8.1.1. Potential Issues

Regardless of the final engineering design, marine environmental issues associated with the proposed project are focussed around the proposed construction and operation of marine infrastructure, and effects on water quality as a result of operational discharges to the sea from the desalination plant.

Potential environmental impacts on the coastal and marine environment affected by the construction of the proposed seawater intake structure and brine disposal system will include:

- Removal of the bottom sediment and associated communities (i.e. temporary loss of benthic habitat) during installation of the intake and discharge structures (e.g. open water intakes, pipelines, sumps and pump stations, surf-zone discharge structures etc.);
- Smothering of benthic communities through disposal of excavated sediments;
- Increased suspended sediment concentrations and turbidity during excavation and dumping;
- Potential release of nutrients to the water column;
- Noise and pollution from the construction activities;
- Potential contamination of marine waters and sediments by inappropriate disposal of spoil and/or surplus rock from construction activities or backfilling, used lubricating oils from marine machinery maintenance and human wastes, which could in turn lead to impacts upon marine flora, fauna and habitat;
- Possible impacts to marine water quality and sediments through hydrocarbon pollution by marine construction infrastructure and plant;
- Establishment of an exclusion zone around the construction site and along the pipeline;
- Creation of artificial rocky substrata at the intake and pipeline supporting structures, in an otherwise sand-dominated area; and
- Altered flows around the intake and discharge structures resulting in hydrodynamic and/or ecological impacts.

Potential environmental impacts on the coastal and marine environment affected by the plant discharges include:

- The effect of elevated salinities on marine biota in the effluent plume footprint;
- The effect of the discharged effluent potentially having a higher temperature than the receiving environment;
- Co-discharge of co-pollutants in the brine effluent and silty sediments flushed from the sump; potential increased in turbidity; and
- Altered dissolved oxygen concentrations in the brine plume.

During the Scoping Phase and public consultation process, the following additional engineering design and operational issues relevant to the marine environment were raised by I&APs:

- flexibility is required in the engineering design and/or the operating procedure should monitoring identify significant negative impacts beyond the sacrificial zone.
- a synopsis of the results of studies conducted elsewhere during the operation of plants of similar size to that proposed, and in similar environments should be included.

Additional issues and impacts in terms of marine ecology are included in the Marine Ecology specialist study, Chapter 6 of this Final EIA Report.

4.8.1.2. Terms of Reference and Approach

The Marine Ecology specialist study undertook a desktop approach. The Marine Specialist Report includes:

- A description of the baseline marine biology in the project area, emphasising, but not limited to, sensitive and threatened habitats, and threatened or rare marine fauna and flora;
- A review and expert interpretation of all relevant, available local and international publications and information sources on the disturbances and risks associated with hypersaline effluents;
- Identification and description of all factors resulting from the construction and operation of the desalination plant and associated infrastructure that may influence the marine and coastal environments in the region;
- An identification of sensitive areas;
- An assessment of the impacts of the proposed development on the marine ecology of the project area during the construction and operational phases of the desalination plant;
- Recommendations for mitigation and monitoring of impacts;
- Compilation of an EMPr for the marine aspects of the construction and operational phases of the intake structure and brine disposal systems; and
- Addressing any comments raised by the public, where relevant and applicable.

4.8.2. Terrestrial Ecology Assessment

4.8.2.1. Potential Issues

The construction phase of the desalination plant is likely to affect the following ecological components:

- The frontal dune cordon is likely to be subject to destabilisation through excavation and effects of stabilisation on the northern and southern coastal dynamics;
- Wetland and estuarine zone habitat – natural forest form in and around the north bank of the Lovu estuary will be removed for the construction of the pipeline. This may impact on slope stability and will also give rise to water quality issues; and
- The estuarine functional zone habitat, particularly where cultivation is the present land use, will be affected primarily by water quality and turbidity issues.

The operational phase impacts are considered to include the following:

- Stabilisation requirements and effect of the pump station and marine pipelines on beach and dune cordon dynamics and subsequent stability / instability; and
- Rehabilitation and stewardship of the estuarine functional zone, including associated forest components. The effect of exotic plant invasion and changes in edaphic processes will alter site specific ecology with some alteration on local ecology.

Given the above information, the following issues have been considered during the EIA Phase (as part of the specialist study):

- The nature and structure of the frontal dune cordon, particularly in relationship to the mouth dynamics of the Lovu River, as well as sea level rise and storm inundation scenarios. Such consideration will advise of the most appropriate method of establishing pipe systems through this environment;
- The impacts of stabilizing the frontal dune and its effects to the northern and southern coastal dynamics;
- The estuarine and associated forest forms and structure in relation to the specific routing of the pipeline and placement of the pump station and desalination plant; and
- Delineation and consideration of the wetland system, particularly its role and function around the desalination plant.

During the Scoping Phase and public consultation process, the following key terrestrial ecological issues were raised by I&APs:

- The removal of natural habitats, in particular the dune forest (Department of Agriculture Forestry and Fisheries);
- The quantification of the loss of natural habitat for primarily offset or rehabilitation purposes; and
- Rehabilitation and mitigation measures to address loss of natural habitat.

Additional issues and impacts in terms of terrestrial ecology are included in the Terrestrial Ecology specialist study, Chapter 9 of this Final EIA Report.

4.8.2.2. Terms of Reference and Approach

In order to successfully interpret and evaluate the biophysical status of the proposed subject site, two levels of evaluation have been undertaken. These include:

- **High level evaluations.** High level desktop reviews have been undertaken for the proposed Lovu desalination site, noting footprints of the proposed desalination points and facilities within the ecological landscape. This includes a consideration of prevailing topography (natural and/or artificial) and a review of ecological drivers within the landscape. An evaluation of aerial imagery and pertinent literature has also been undertaken.
- **Site Specific Evaluations.** A second level of site specific evaluations taking into consideration the habitats associated with the 1) *near shore supra tidal environment* and 2) *the terrestrial, mesic environment* at the proposed site has also be undertaken.

The Terrestrial Ecology Assessment includes:

- A review of pertinent literature;
- Consideration of aerial imagery pertaining to the proposed site in order to determine changes in habitat form, morphology or other variations;
- A site investigation in order to evaluate and support or dismiss interpretations emanating from evaluation of aerial imagery;
- Consideration and assessment of the anticipated impacts that may arise from the establishment of the proposed plant.
- A description of applicable legislation as it may relate to the receiving environment, as well as the level and severity of the impacts identified and the legal ramifications thereof;

- Possible options for mitigation, including design and technology alternatives, construction methods and variations to the operations of the plant as well as the possible option of maintenance of the status quo and the abandonment of the project on the site in question, if fatal flaws were identified.
- Rehabilitation and mitigation options in respect of the terrestrial environment that would be both directly and indirectly affected by the implementation of the desalination project.

4.8.3. Aquatic Ecology Assessment (Freshwater Resources)

4.8.3.1. Potential Issues

The following impacts at least are likely to be associated with the proposed alignments of the intake pipelines:

- Further disturbance to channel banks and beds at crossing points;
- Potential to trigger headcut erosion by altering upstream gradients at wetland crossing points;
- Construction-related water quality impacts; and
- Possible soil and/or water quality impacts associated with accidental leakage or breakage of the pipelines, and the resultant passage of seawater into freshwater wetlands; this impact would probably be of less significance in the event that it occurred in estuarine areas rather than other, freshwater wetlands.

Both proposed desalination plant sites (i.e. preferred and alternative) are located outside of the 1:100 year floodline of the Lovu River. The (developer's) preferred alternative lies much closer to the river channel, however, selection of this site would potentially affect the extent to which riverine buffers can be maintained or provided along the channel in the affected reaches. From this perspective, it is possible that the alternative site may be associated with lower levels of impact from a freshwater ecosystem perspective. However, the latter site closely abuts and may in fact include a number of watercourses and associated wetlands, the importance of which has been addressed in Chapter 8 of this Final EIA Report.

In addition to issues of encroachment into river corridors and proximity to other watercourses, issues such as the management of stormwater runoff from hardened surfaces into water courses have been discussed in Chapter 8 of this Final EIA Report.

In addition to the above impacts identified by the specialist during the Scoping Phase, comments from I&APs after release of the Final Scoping Report included issues relating to freshwater ecosystems (as discussed in Section 8.4 of Chapter 8 of this Final EIA Report).

4.8.3.2. Terms of Reference and Approach

The Aquatic Ecology specialist study is based on the following approach:

- Undertaking a site visit, for ground-truthing of mapped National Freshwater Ecosystem Priority Area wetlands, both on the site footprints and along the proposed pipeline corridors to the site;
- Use the above information to provide a description of the baseline environment, including identification and mapping of wetland / river ecosystems; comments on their sensitivity and

importance/conservation significance, and where appropriate, rapid assessments of Present Ecological State (PES) and/or Wetland Ecosystem Services;

- Finalisation of a wetland sensitivity map;
- Determine and assess the potential negative and any positive impacts to freshwater ecosystems that could result from the proposed development and include mitigation measures to reduce negative impacts, where possible;
- Report on potential impacts and recommended mitigation measures in terms of the pre-construction, construction and operational phase;
- Describe cumulative impacts, and assess their significance;
- Provide recommendations for construction and operational phase monitoring.
- Liaise with the terrestrial ecology and estuary ecology specialists and incorporate findings into the report, as applicable; and
- Compilation of the specialist study report.

4.8.4. Estuarine Ecological Impact Assessment

4.8.4.1. Potential Issues

Neither a raw water intake nor an effluent outfall is planned for the Lovu estuary as part of the proposed desalination plant. Rather water will be drawn from, and effluent disposed of in, the offshore marine environment. Potential impacts of this have been assessed as part of the Marine Ecology Assessment (Chapter 6).

Expected estuarine impacts are largely limited to the potential impacts of construction and operation of infrastructure (buildings, pipelines and servitudes) near the Lovu estuary, and possible influences of intakes/outfalls for estuarine organisms in the marine environment (e.g. influences on recruitment processes).

The following key issues have been investigated in the Estuarine Ecological Impact Assessment (Chapter 7 of this Final EIA Report):

- Construction and operation of inflow and outflow pipelines:
 - Further destruction and disturbance of floodplain vegetation;
 - Increased turbidity in the estuary during excavation and construction. Resultant effects on fauna and possible increased siltation and smothering of benthic fauna;
 - Potential release of contaminants (old dumpsite) into the estuary; and
 - Disturbance to bird populations (noise, movement of machinery and workers).
- Construction and operation of the desalination plant:
 - Permanent destruction of onsite vegetation and disturbance of adjacent floodplain vegetation;
 - Increased turbidity in the estuary during excavation and construction. Resultant effects on fauna and possible increased siltation and smothering of benthic fauna; and
 - Disturbance to bird populations (noise, movement of machinery and workers).
- Discharge of wastewater (brine) to the nearshore environment:
 - Possible entrainment of brine into the nearshore environment at the mouth of estuary; and

- Potential impacts on recruitment into the estuary due to loss of cues such as reduced salinity.

4.8.4.2. Terms of Reference and Approach

A detailed description of the methodology used in the Estuarine Ecological Impact Assessment is included in Chapter 9 of this Final EIA Report. Overall, the Estuarine Ecological specialist study has adopted a desktop approach, augmented by a field survey of botanic and fish assemblages in the estuary. The Specialist Report includes:

- Results of field surveys (botanic and fish assemblages);
- A description of the baseline estuarine biology in the project area, including sensitive and threatened habitats, and threatened or rare estuarine fauna and flora;
- Identification and description of factors resulting from the construction and operation of the desalination plant (and associated infrastructure) that may influence the estuarine environment;
- An assessment of the impacts of the proposed development on the ecology of the Lovu estuary during the construction and operational phases of the desalination plant; and
- Recommendations for mitigation identified significant impacts.

4.8.5. Noise Impact Assessment

4.8.5.1. Potential Issues

The following key issues related to potential noise impacts of the proposed development have been investigated in the Noise Impact Assessment (Chapter 11 of this Final EIA Report):

- Current noise profile for the proposed desalination plant site, by day and night;
- Noise impact during construction and operation of the plant and associated infrastructure, in particular due to the proximity of the Mother of Peace Illovo orphanage/school, by day and night;
- Extent of noise impacts for different frequencies, in particular low frequency vibrations;
- Location of local sensitive human receptors (e.g. closest residential areas); and
- Potential noise impacts on fauna and avifauna.

The Noise Impact Assessment has investigated the above issues, as well as other issues and concerns raised by I&APs during the Scoping Phase of the EIA. These are discussed in detail in Section 9.5 of the Final EIA Report.

4.8.5.2. Terms of Reference and Approach

The Noise Impact Assessment is based on the following overall approach:

- Provide a description of the current environmental conditions from a noise perspective in sufficient detail so that there is a baseline description/status quo against which impacts can be identified and measured;
- Conduct a desktop study of available information that can support and inform the specialist noise study;

- Identify the components of the project that could generate significant noise levels;
- Identify all noise sensitive receptors within the study area. These include the receptors within 1 km of the site boundary (external to the site);
- Undertake a site visit to measure the existing ambient noise at the proposed site during both the day and night time;
- Conduct a noise modelling study of the future impact during construction and operation of the desalination plant, taking into account sensitive receptors;
- Prediction of the future ambient noise levels due to the noise emissions during the construction and operation of the proposed project (and alternatives);
- Identify issues and potential impacts, as well as possible cumulative impacts related to the noise aspects of the project; and
- Identify management and mitigation actions to enhance positive impacts and avoid/reduce negative impacts respectively.

A detailed description of the methodology used and relevant legislation and standards applicable to the Noise Impact Assessment is included in Chapter 10 of this Final EIA Report.

4.8.6. Visual Impact Assessment

4.8.6.1. Potential Issues

Key issues related to potential visual impact of the proposed development were identified in a desktop analysis and have been investigated in the Visual Impact Assessment (Chapter 10 of this Final EIA Report). These issues include:

- Potential impact of construction activities (pump station, seawater intake and brine discharge pipelines) on existing sea views of residents living in southern Winklespruit and The Boardwalk estate.
- Potential visual impact of construction activities of beach users in the vicinity (up to 5 km away depending on the topography of the beach in this area) of seawater intake and brine discharge pipelines and structures (e.g. Illovo Beach);
- Potential visual intrusion of construction activities on views of residents living just north of the Lovu River, and rural residents east of the desalination plant sites;
- Potential visual intrusion of construction activities on views of residents living near the Lovu River where the pipe bridge may be built;
- Potential visual intrusion of a pump station on the existing sea views of residents living in close proximity to the proposed sites (Winklespruit and The Boardwalk);
- Potential visual intrusion of a desalination plant on views of residents in the surrounding area;
- Potential landscape impact of introducing an industrial development into a predominantly agricultural and residential area;
- Potential impact of night lighting of the desalination plant on the nightscape of the area and on existing views of sensitive visual receptors; and
- Potential visual intrusion on existing views of residents near the proposed pipe bridge across the Lovu River.

The Visual Impact Assessment has investigated the above issues, as well as other issues and concerns raised during the Scoping Phase of the EIA. Other issues identified by the visual specialist during the site visit and investigation are also discussed in the Visual Impact Assessment. These are discussed in detail in Section 10.4 of the Final EIA Report.

4.8.6.2. Terms of Reference and Approach

The Visual Impact Assessment is based on the following approach:

- Conduct a rapid desktop review of available information that can support and inform the specialist study;
- Characterise the visual character of the area and visual absorption capacity;
- Review detailed information relating to the project description and precisely define the environmental risks to the landscape and the risks to sensitive viewers, as well as the consequences thereto;
- Conduct a site visit and undertake a Photographic Survey of the surrounding region from which the landscape and visual baselines can be prepared;
- Compile a baseline description of the visual character/baseline and the landscape of the affected area;
- Undertake data preparation and the visibility analysis, which includes the calculation of viewsheds for various elements of the proposed development. Identify principal viewpoints and sensitive visual receptors;
- Assess the potential impacts, both positive and negative, as well as potential cumulative impacts, associated with the proposed project for the construction, operation and decommissioning phases;
- Identify management actions to avoid or reduce negative impacts; and to enhance positive benefits of the project; and
- Develop a monitoring programme to be included in the EMPr.

4.8.7. Socio-economic Assessment

4.8.7.1. Potential Issues

The Socio-economic Assessment has investigated the following issues and impacts, as well as other issues and concerns raised by I&APs during the Scoping Phase of the EIA. These are discussed in detail in Chapter 12 of the Final EIA Report.

- Broad level review of the need and financial viability/risks associated with the project. This is based primarily on information from Umgeni Water. It is assumed that an adequate assessment of technical and financial feasibility of the project has been conducted to establish viability and justify further assessment of the project in the EIA Phase;
- Degree of fit with local, regional and national economic development visions and plans including water supply plans. Comparisons regarding the appropriateness of the use of energy for desalination versus other uses is also considered at a strategic level and related back to overall cost comparisons;
- Impacts on overall economic development potential in the area including impacts on commercial enterprises nearby the site (including tourism, agriculture, mariculture, fisheries and others);
- Impacts associated with project expenditure on direct and indirect employment and household incomes;
- Impacts associated with upstream and downstream economic linkages and spin-offs, taking import content and other relevant factors into consideration; and
- Impacts associated with environmental impacts that cannot be mitigated and have economic implications. This focusses on potential negative impacts on neighbouring land owners should they be relevant (e.g. Illovu Sugar Estate Offices

(located on the preferred site) and Mother of Peace Children's Home located adjacent to the preferred site).

4.8.7.2. Terms of Reference and Approach

The approach adopted involves the following steps in line with accepted assessment practice:

- Provide a profile of the existing economic and planning/development context within which the project would be established;
- Identify significant economic impacts for assessment and placed them in a broad cost-benefit analysis framework; and
- Assess significant economic impacts to the extent judged appropriate and recommend appropriate management and mitigation measures.

In order to establish the existing economic environment affected by the project, information would be gathered from the following sources in order to investigate the existing economic situation that would be affected by the project:

- Information generated during consultations with the public and authorities;
- Statistical databases such as Census information; and
- Local economic development and planning documents.

The study aims to assess the impacts of the project focusing on the local, regional and national scales where relevant. Adverse, positive, direct and indirect impacts have been identified for the establishment and operational phases focusing on the alternative sites.

Impacts are assessed in accordance with the provincial guidelines for economic specialist inputs into EIAs (van Zyl *et al.*, 2005) that use a cost benefit analysis framework. It is assumed that no social specialist study will be commissioned as part of the EIA Process increasing the likelihood that the economic specialist study will also provide an assessment of impacts on neighbouring land owners.

A detailed description of the methodology used in the Socio-economic Assessment is included in Chapter 12 of this Final EIA Report.

4.8.8. Heritage Impact Assessment – Letter of Exemption

As noted in Section 4.2.1.15 of this chapter, a letter of motivation was compiled and submitted to Amafa/Heritage AKwaZulu-Natali (included in Appendix E of this Final EIA Report) in order to seek approval for an exemption from conducting a full Heritage Impact Assessment.

The following approach was undertaken for the brief assessment of impacts on heritage resources:

- A desktop review of all heritage resources in the area affected;
- A site visit to ascertain and verify the heritage resources present within the study area;
- An assessment of the overall impact of the proposed development on heritage resources; and
- Compilation of the letter of motivation for exemption from a full Heritage Impact Assessment.