

MATLA POWER STATION REVERSE OSMOSIS (RO) PLANT


Mpumalanga Province


Final Basic Assessment Report
DEA Ref.: 14/12/16/3/3/1/2128

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PROJECT DETAILS

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PURPOSE OF THE BA REPORT AND INVITATION TO COMMENT

Eskom Holdings SOC Ltd is proposing the installation and commissioning of a Reverse Osmosis Plant (hereafter 'RO Plant') at the Matla Power Station. The RO Plant will be located on Portion 4 of Bakenlaagte 84, which is situated ~60km south of eMalahleni, ~4km south-west of Kriel Power Station and ~12km west of the town of Kriel in the Mpumalanga Province. At the station, the wet ash system is used for ash removal. In this system, coarse and fly ash are mixed with water to create slurry, which is then pumped to the ash dam. At the ash dam, the free water is then removed from the top of the dam by a penstock. The remaining water will go through filter drains into a solution trench. The water collected by the penstock and the solution trench is then transported to the Final Cut-off Dam. From the Final Cut-off Dam, the water is then pumped back to the Ash Water Return (AWR) Reservoir where it is re-used in the ash system to transport ash slurry to the ash dam. Although, the correct management of the system ensures that minimal water is being consumed, various issues have compelled the station to use emergency makeup water from different sources for ash slurry transport. By using these additional sources, the water level in the Final Cut-off Dam has started increasing at an alarming rate, thus creating a need to reduce the current water level at the Final Cut-off Dam by using the RO technology to treat the water while the station optimises its water management strategy.

The project is known as the **Matla Power Station Reverse Osmosis Plant** and falls within the jurisdiction of the Nkangala District Municipality (NDM) and the eMalahleni Local Municipality (ELM). Currently, the RO Plant is located at the Camden Power Station where it will be decommissioned¹ and transported by trucks for its installation and commissioning on a site 2km east of the Matla Power Station units and approximately 890m south-east of the Ash Dam.

In terms of Environmental Impact Assessment (EIA) Regulations 21 and 24 of the 2014 EIA Regulations (GN R326), as amended, which were promulgated under the National Environmental Management Act, 1998 (Act No. 107 of 1998) the installation and operation of the RO Plant at the Matla Power Station requires environmental authorisation from the National Department of Environmental Affairs (DEA)² subject to the completion of a BA process. The main triggered listed activities are Activities 25 and 31(i) of Listing Notice 1 (GN R327), i.e. the development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage and the decommissioning of existing facilities, structures or infrastructure for any development and related operation activity listed in GN R324, 325 and 326. The RO Plant will have a treatment capacity of 4 380m³ per day and will be operational for a maximum period of three (3) after which it will be decommissioned.

The BA Report was made available for a 30-day review and comment period from **24 January – 24 February 2020** at the following locations

- » Kriel Public Library, Cnr Quintin and Heinrich Street, Kriel; and
- » <https://www.savannahsa.com/public-documents/other/>

The Final BA Report includes all comments received, as well as responses to those comments (refer to **Appendix C6**) and where applicable, this Final BA Report has been amended to address these comments.

¹ The decommissioning of the RO Plant at the Camden Power Station is not considered in this BA process.

² The Department of Environmental Affairs (DEA) is soon to become the Department of Environment, Forestry and Fisheries (DEFF).

All amendments/changes and/or additions made to this Final BA Report have been underline for ease of reference.

EXECUTIVE SUMMARY

Eskom Holdings SOC Ltd is proposing the installation and commissioning of a Reverse Osmosis Plant (hereafter 'RO Plant') at the Matla Power Station. The RO Plant will be located on Portion 4 of Bakenlaagte 84, which is situated ~60km south of eMalahleni, ~4km south – west of Kriel Power Station and ~12km west of the town of Kriel in the Mpumalanga Province. The project is known as the **Matla Power Station Reverse Osmosis Plant** and falls within the jurisdiction of the Nkangala District Municipality (NDM) and the eMalahleni Local Municipality (ELM). A new RO Plant will be procured or the existing RO Plant at the Camden Power Station, which is to be decommissioned³, will be transported by trucks to the Matla Power Station for its installation and commissioning. The project site identified for the installation of the RO Plant at the Matla Power Station is located 2km east of the station's main footprint and approximately 890m south-east of the existing Ash Dam (Figure 1).

At the station, the wet ash system is used for ash removal. In this system, coarse and fly ash are mixed with water to create slurry, which is then pumped to the ash dam. At the ash dam, the free water is then removed from the top of the dam by a penstock. The remaining water will go through filter drains into a solution trench. The water collected by the penstock and the solution trench is then transported to the Final Cut-off Dam. From the Final Cut-off Dam, the water is then pumped back to the Ash Water Return (AWR) Reservoir where it is re-used in the ash system to transport ash slurry to the ash dam. Although, the correct management of the system ensures that minimal water is being consumed, various issues have compelled the station to use emergency makeup water from different sources for ash slurry transport. By using these additional sources, the water level in the Final Cut-off Dam has started increasing at an alarming rate, thus creating a need to reduce the current water level at the Final Cut-off Dam by using the RO technology to treat the water while the station optimises its water management strategy. The purpose of the RO Plant development is to treat the Ash Water Return (AWR) from the Ash Dam so as to reduce the spillage risk currently presented by the Final Cut-off Dam. The RO Plant will have a treatment capacity of 4 380m³ per day. The development footprint of the RO Plant will not exceed 2ha in extent and will include the following specific infrastructure, namely:

- » Reverse Osmosis Modules;
- » Filtration Skids;
- » A Sulphuric Acid Tank;
- » A pipeline to connect the various components of the RO Plant to the Final Cut-off Dam;
- » Concrete support structures (including slab) for the RO Plant Infrastructure;
- » Chemical Stores;
- » Security Fencing; and
- » Electricity distribution boards.

The project site considered within this BA process is heavily modified due to anthropogenic disturbance at the station as a result of previous developments (i.e. construction of the Ash Dam, the Pump House, etc.). The affected property, Portion 4 of the Farm Bakenlaagte 84 is approximately 107ha in extent and will accommodate the project site identified for the installation and operation of the RO Plant. Construction

³ The decommissioning of the RO Plant at the Camden Power Station is not considered in this BA process.

phase of the RO plant will take approximately 6 months. The RO Plant will be operated for a maximum period of three (3) years following which it will be decommissioned.

Existing infrastructure within the project site identified for the installation and operation of the RO Plant include the Final Cut-off Dam, a Pump House and an Auxiliary Building.

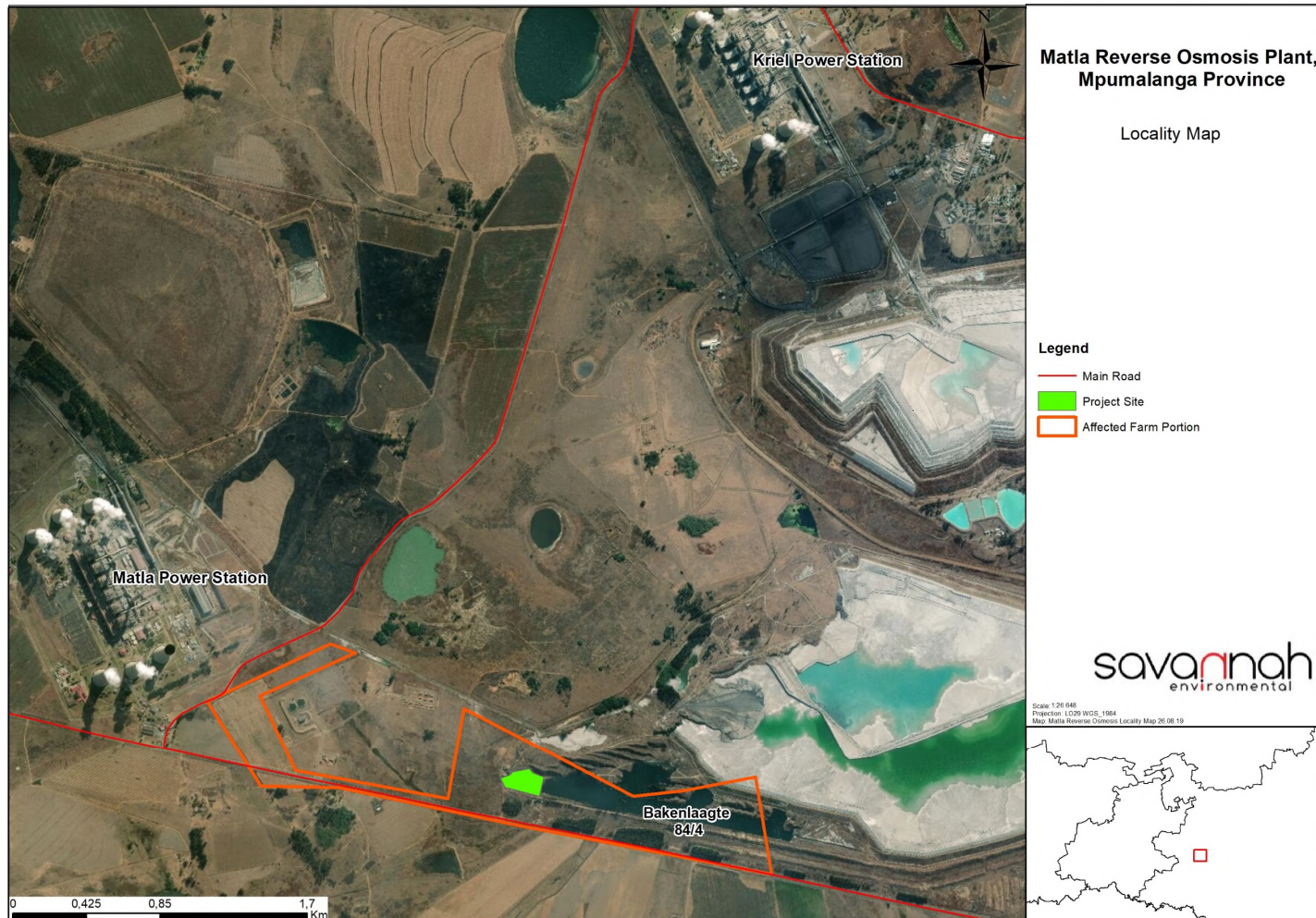


Figure 1: Locality map showing the site under investigation for the establishment of the RO Plant at the Matla Power Station.

The project site is located within a brownfields area which has been extensively transformed due to previous large-scale anthropogenic activities. No sensitive environmental features are located within the site. There will, therefore, be no impacts on biodiversity or ecology. The area is not located in close proximity to any residential areas, with the nearest being the town of Kriel at 10km to the north-east of the project site.

The potential impacts associated with the installation and operation of the RO Plant at the Matla Power Station identified and assessed through the BA process include:

- » Impacts on surface water
- » Impact on soil resources
- » Intrusion impacts
- » Waste generation and storage and handling of hazardous substances
- » Impact on the socio-economic environment
- » Impact on heritage and palaeontological resources

Impacts on Surface Water

The development of the RO Plant at the Matla Power Station will have a positive impact on the station's water management strategy, as the proposed development will treat wastewater from the Final Cut-off Dam which will inevitably reduce the station's raw water consumption during the period of its operation. The treated water from the RO Plant will be re-used within the station for industrial and domestic uses. This will reduce demand for abstraction from natural resources and therefore, this will free up and avail water resources to the environment and other water users in the area. Furthermore, the installation and operation of the RO Plant serves as an intervention from the station to prevent the spillage of the Final Cut-off Dam to the surrounding environment downstream, which include numerous freshwater resources.

The project site identified for the RO Plant is located approximately 140m away from a National Freshwater Ecosystem Priority Area (NFEPA) Wetland. The development of the RO Plant could have a negative impact on this wetland as a result of surface water run-off transporting soil particles which could lead to siltation. This impact is anticipated to be of a low significance subject to the implementation of the recommended mitigation measures included in the EMPr (**Appendix G**). The proponent has a Water Use Licence (WUL) (included in this BA Report as **Appendix I**) from the Department of Water and Sanitation for the current power station impacts and has made application to DWS for a new WUL to include the activities of the RO Plant.

Impacts on Soil Resources

The installation of the RO Plant will require the undertaking of excavations into the sub-surface to allow for the siting of concrete support structures required for the placement of the RO Plant infrastructure and bund walls for the storage of hazardous substances. These activities, which will be associated with the pre-construction and construction phase of the proposed development, may have an impact on the soil resource within the project site. In addition, during the decommissioning phase, the constructed foundations and other concrete structures required for the installation and operation of the RO Plant would be removed from the project site, unless required for other purposes. However, the impact is not anticipated to be of a high significance considering the nature of the project site (i.e. brownfields site),

and the extent of the area (< 2ha) to be cleared for the installation of the RO Plant and associated infrastructure.

Taking the above into consideration, the installation, operation and decommissioning of the RO Plant at the Matla Power Station is therefore, supported from a soil's perspective, subject to the implementation of the recommended mitigation measures.

Intrusion impacts

Construction vehicles will make use of existing access roads to and within the station to access the project site for the RO Plant. Roads within the power station boundary are predominantly gravel in nature and could, therefore, lead to the generation of dust particles. In addition, excavations and other construction-related activities (i.e. trenching) during the construction phase will generate dust particles. Therefore, the section of the power station footprint under consideration for the BA process will experience a slight increase in traffic, as vehicles and machinery will be commuting to and from the area to deliver employees and other components required for the installation of the RO Plant during the construction phase. As the nearest residential area is approximately 10km from the site, there will be no impact on these residential areas.

Taking the above aspects into consideration and the short timeframe of the construction phase (i.e. 6 months), the significance of intrusion impacts particularly from dust generation and traffic will be of a low significance subject to the implementation of the recommended mitigation measures.

During the operation phase, the RO Plant is anticipated to generate noise which will not exceed 85dB. Employees working within the RO Plant containers will be provided with hearing protection during the operational phase of the project.

Taking the above into consideration, it is concluded that the significance of the intrusion impacts as a result of the proposed development will be low, subject to the implementation of the recommended mitigation measures included in the EMPr.

Waste Generation

The pre-construction, construction, operation and decommissioning phase the RO Plant will include the generation of domestic and hazardous waste. Waste as a result of the treatment process of the water from the Final Cut-off Dam will be transported to the ash dam. This impact is anticipated to be of a low significance, subject to the recommended mitigation measures.

Storage and Handling of Hazardous Substances

The development of the RO Plant will require the handling and storage of hazardous substances, particularly sulphuric acid and other chemicals which will be required during the reverse osmosis treatment process. Therefore, if these substances are not stored and handled correctly, they may pose a risk to the employees working within the area and the surrounding environment. The mitigation and management measures to reduce the impact adhere to the requirements included in the South African National Standards (SANS) regarding the warehousing of dangerous goods, and any legislation applicable to the storage and handling of the hazardous substances.

Taking the above into consideration, it is concluded that the significance of the generation of waste impact as a result of the project life cycle of the RO Plant will be low, subject to the implementation of the recommended mitigation measures.

Impact on the Socio-Economic Environment

The pre-construction (which will largely involve site-clearing) and construction phase of the RO Plant will be short-term. It is anticipated this phase of the project will not exceed six (6) months. Eskom has indicated that the project will be worth R39 000 000, and the total value will be spent in the Republic of South Africa and the Mpumalanga Province. Furthermore, Eskom has indicated that, at least, ~30 employees will be required for the construction of the proposed RO Plant. Although small, this could have a positive socio-economic impact on the local area.

Impacts on residential areas will be of a low significance to the social setting in the area considering that the project site identified for the development and operation of the RO Plant is located 10km away from the nearest residential area, Kriel. Furthermore, the project site is well located outside the vicinity of sensitive social receptors such as clinics, old age homes and schools in the area.

Impact on Heritage and Palaeontological resources

No heritage resources of a high significance were identified within the study and project site of the RO Plant (refer to the Heritage Impact Assessment contained in **Appendix E**). Although the project site is associated with a high sensitivity in terms of palaeontology, the footprint of the RO Plant and the associated infrastructure will not exceed 2ha; also the foundations will only be of a shallow depth; therefore, it is anticipated that the project will not pose any significant risk to fossils located in the sub-surface in the area. Should these be discovered during the construction phase of the development, the proponent is obligated to implement the Chance Find Protocol (included as **Appendix C** in the EMPr).

Decommissioning Impacts

The RO Plant at the Matla Power Station is expected to have a lifespan of at least 3 years (with routine maintenance). The infrastructure would only be decommissioned, and the project site rehabilitated at the end of the 3-year lifespan. It is most likely that decommissioning activities of the infrastructure of the RO Plant considered in the BA process would comprise the disassembly of the plant's individual components. Therefore, site preparation activities will include confirming the integrity of the access to the site to accommodate required equipment, preparation of the site (e.g. bunded areas, foundations etc.) and the mobilisation of construction equipment required to undertake decommissioning activities. Disassembled components of the RO Plant and the associated infrastructure, where possible, will be re-used, recycle, or disposed of in accordance with the regulatory requirements of NEMWA (Act No. 59 of 2008) and other relevant legislation.

DEFINITIONS AND TERMINOLOGY

Alternatives: Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, process or technology alternatives, temporal alternatives or the 'do nothing' alternative.

Commence: The start of any physical activity, including site preparation and any other activity on site furtherance of a listed activity or specified activity, but does not include any activity required for the purposes of an investigation or feasibility study as long as such investigation or feasibility study does not constitute a listed activity or specified activity.

Commissioning: Commissioning commences once construction is completed.

Construction: Construction means the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity. Construction begins with any activity which requires Environmental Authorisation.

Cumulative impacts: 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 (e.g. discharges of nutrients and heated water to a river that combine to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period and can include both direct and indirect impacts.

Decommissioning: To take out of active service permanently or dismantle partly or wholly, or closure of a facility to the extent that it cannot be readily re-commissioned. This usually occurs at the end of the life of a facility.

Direct impacts: Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation, or maintenance of an activity and are generally obvious and quantifiable.

Disturbing noise: A noise level that exceeds the ambient sound level measured continuously at the same measuring point by 7 dB or more.

'Do nothing' alternative: The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

Emergency: An undesired/ unplanned event that results in a significant environmental impact and requires the notification of the relevant statutory body, such as a local authority.

Environment: the surroundings within which humans exist and that are made up of:

- i. The land, water and atmosphere of the earth;

- ii. Micro-organisms, plant and animal life;
- iii. Any part or combination of (i) and (ii) and the interrelationships among and between them; and
- iv. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental impact: An action or series of actions that have an effect on the environment.

Environmental impact assessment: Environmental Impact Assessment, as defined in the NEMA EIA Regulations and in relation to an application to which scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of that application.

Environmental management: Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental management programme: A plan that organises and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its ongoing operation and maintenance after implementation.

Heritage: That which is inherited and forms part of the National Estate (Historical places, objects, fossils as defined by the National Heritage Resources Act of 2000).

Indirect impacts: Indirect or induced changes that may occur because of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to 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 because of the activity.

Interested and affected party: Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups, and the public.

No-go areas: Areas of environmental sensitivity that should not be impacted on or utilised during the development of a project as identified in any environmental reports.

Pollution: A change in the environment caused by substances (radio-active or other waves, noise, odours, dust or heat emitted from any activity, including the storage or treatment or waste or substances).

Pre-construction: The period prior to the commencement of construction. This may include activities which do not require Environmental Authorisation (e.g. geotechnical surveys).

Significant impact: An impact that by its magnitude, duration, intensity, or probability of occurrence may have a notable effect on one or more aspects of the environment.

Waste: means –

- (a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substances material or object whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3; or
- (b) any substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette,

but any waste or portion of waste, referred to in paragraphs (a) and (b) ceases to be a waste –

- (i) once an application for its re-use, recycling or recovery has been approved or, after such approval, once it is, or has been re-used, recycled or recovered;
- (ii) where approval is not required, once a waste is, or has been re-used, recycled or recovered;
- (iii) where the Minister has, in terms of section 74, exempted any waste or a portion of waste generated by a particular process from the definition of waste; or
- (iv) where the Minister has, in the prescribed manner, excluded any waste stream or a portion of a waste stream from the definition of waste

ABBREVIATIONS AND ACRONYMS

BA	Basic Assessment
BAR	Basic Assessment Report
dB	Decibel
DEA	National Department of Environmental Affairs
DME	Department of Mineral Resources
DOT	Department of Transport
DWS	Department of Water and Sanitation
EMPr	Environmental Management Programme
GG	Government Gazette
GN	Government Notice
Ha	Hectare
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
km ²	Square kilometres
km/hr	Kilometres per hour
m ²	Square meters
m ³	Cubic meters
m/s	Meters per second
ML	Megalitres
MDEDET	Mpumalanga Department of Economic Development and Tourism
MSDS	Material Safety Data Sheet
NEMA	National Environmental Management Act (Act No 107 of 1998)
NHRA	National Heritage Resources Act (Act No 25 of 1999)
NEMWA	National Waste Act (Act No. 59 of 2008)
NWA	National Water Act (Act No 36 of 1998)
pH	Potential of Hydrogen
<u>ppm</u>	<u>Parts Per Million</u>
RO	Reverse Osmosis
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework
SOC	State Owned Company

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CHAPTER 1: INTRODUCTION

Eskom Holdings SOC Ltd is proposing the installation and operation of a Reverse Osmosis Plant (hereafter 'RO Plant') at the Matla Power Station located ~60km south of eMalahleni, ~4km south – west of Kriel Power Station and 12km west of the town of Kriel in the Mpumalanga Province (refer to **Figure 1.1**). The project is known as the **Matla Power Station Reverse Osmosis Plant** and falls within the jurisdiction of the Nkangala District Municipality (NDM) and the eMalahleni Local Municipality (ELM) in the Mpumalanga Province. A new RO Plant will be procured or the existing RO Plant at the Camden Power Station, which is to be decommissioned, will be transported by trucks to the Matla Power Station for its installation and commissioning. The project site identified for the installation of the RO Plant at the Matla Power Station is located 2km east of the station's main footprint and approximately 890m south-east of the existing Ash Dam.

Matla Power Station consists of six (6) 600MW units, with an overall generating capacity of 3 600MW. The power station was commissioned in the 1980s. The station was designed for an operational life span of 30 years but following the identification of substantial coal reserves in the Mpumalanga Highveld, the operational life of the station was extended by an additional 20 years. As a base load coal fired power station, Matla Power Station operates continuously except for regular scheduled stoppages on individual sets for inspection and maintenance.

At the Matla Power Station, the wet ash system is used for ash removal. In this system, coarse and fly ash are mixed with water to create a slurry, which is then pumped to the ash dam. At the ash dam, the free water is then removed from the top of the dam by a penstock. The remaining water will go through filter drains into a solution trench. The water collected by the penstock and the solution trench is then transported to the Final Cut-off Dam. From the Final Cut-off Dam, the water is then pumped back to the Ash Water Return Reservoir where it is re-used in the ash system to transport ash to the ash dam. Although, the correct management of this system ensures minimal water is consumed, various issues have compelled the station to use emergency makeup water from different sources for ash slurry transport. By using these additional sources, the water level in the Final Cut-off Dam has started increasing at an alarming rate, thus creating a need to reduce the current water level. Therefore, the purpose of the RO Plant will be for the treatment of water contained within the Final Cut-off Dam with the aim of reducing the water level to a safe operating level as well as to treat the water to a quality that is acceptable for use in the Matla Power Station cooling tower system. Albeit for a short-term, the installation of the RO Plant at the station will reduce the spillage risk presented by the water level at the Final Cut-off Dam.

The RO Plant will be operated for a maximum period of three (3) years to reduce the water level of the Final Cut-off Dam and to minimise the spillage risk from the dam. The RO Plant will consist of two (2) separate reverse osmosis modules. The modules will be designed to produce 3000m³ of good quality permeate per day, which will also consist of a pre-treatment and reverse osmosis section. The treated water will be transported back to the station for use in domestic, industrial applications and for use in the ash slurry generation process. The generated by the Plant as a result of the treatment process will be transported via a pipeline to the Ash Dam. It is anticipated that the waste to be transported and stored at the Ash Dam will have a total dissolved solids (TDS) content not exceeding 50 000ppm.

The nature and extent of the RO Plant, including the potential environmental impacts associated with its installation, operation and decommissioning are explored in detail in this Basic Assessment Report (BA)

Report. Site-specific environmental issues are assessed within this BA Report in order to evaluate the potential environmental impacts associated with the project site identified for this proposed development. This BA Report has been prepared in accordance with the requirements as set out in Appendix 1 of the EIA Regulations published on 08 December 2014 (as amended in April 2017), promulgated in terms of Chapter 5 of the National Environmental Management Act (Act No. 107 of 1998) of 1998.

This Chapter of the BA Report includes the following information required in terms of Appendix 1:

Requirement	Relevant Section
3(a) the details of the (i) EAP who prepared the report and (ii) the expertise of the EAP, including a curriculum vitae.	The details of the EAP who prepared the report and the expertise of the EAP is included in Section 1.5. The curriculum vitae of the EAP, project team and independent specialist are included in Appendix A .
3(b) the location of the activity including (i) the 21 digit Surveyor General code of each cadastral land parcel, (ii) where available the physical address and farm name and (iii) where the required information in items (i) and (ii) is not available, the co-ordinates of the boundary of the property or properties.	The location (including the 21-digit SG Surveyor General Code and the co-ordinates) of the assessed project site is included in Section 1.1 and Table 1.1 . A map showing the locality of the activity is included in Chapter 1 as Figure 1.1 . Additional information is also provided regarding the location of the project site which includes the relevant province, local and district municipalities, ward and current land zoning.
3(c)(i)(ii) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or on land where the property has not been defined, the coordinates within which the activity is to be undertaken	Figure 1.1 includes a map which illustrates the location of the study area and project site identified for the establishment of the RO Plant at the Matla Power Station. The centre coordinates of the project site are included in Table 1.1 .

This BA Report consists of the following sections:

- » **Chapter 1** provides a background to the Matla Power Station Reverse Osmosis Plant project and the BA process.
- » **Chapter 2** provides a description of the RO Plant project site and the need and desirability of the project.
- » **Chapter 3** outlines the approach to undertaking the BA process.
- » **Chapter 4** describes the existing biophysical and socio-economic environment within and surrounding Matla Power Station.
- » **Chapter 5** provides an assessment of the potential environmental issues and impacts associated with the installation, operation and decommissioning of the RO Plant and presents recommendations for the mitigation of the identified impacts.
- » **Chapter 6** presents the conclusions and recommendations based on the findings of the BA Report.
- » **Chapter 7** presents references used in the compilation of the BA Report.

1.1 Overview of the Matla Power Station Reverse Osmosis Plant

The affected property, Portion 4 of Bakenlaagte 84 will accommodate the project site for the RO Plant. The affected property is 107 ha in extent and the extent for the project site is 1.66ha. The applicant, Eskom Holdings SOC Limited will procure a new RO Plant or the existing RO Plant currently located at the Camden

Power Station will be decommissioned and transported to the Matla Power Station for its use. The RO Plant will be assembled and operated on a site located approximately 890m west of the Ash Dam at the Matla Power Station and 4km east of the station's main footprint. The RO Plant will be operational for a maximum period of three (3) years within which water from the Ash Dam collecting in the Final Cut-off Dam will be treated at the plant for its use for domestic, industrial applications and for the generation of the ash slurry which is transported by a pipeline and stored at the Ash Dam. The installation and operation of the RO Plant will not require any new access roads, as the existing road network within the footprint of the station is sufficient to provide access for vehicles and machinery during the pre-construction, construction, operation and decommissioning phase of the development.

The Matla Power Station Reverse Osmosis will have a throughput capacity of 4 380m³ per day. The plant will include the following specific infrastructure:

- » Reverse Osmosis Modules;
- » Filtration Skids;
- » A Sulphuric Acid Tank;
- » A pipeline to connect the various components of the RO Plant to the Final Cut-off Dam;
- » Concrete support structures (including slab) for the RO Plant Infrastructure;
- » Chemical Stores;
- » Security Fencing; and
- » Electricity distribution boards.

Table 1.1 provides an overview of the project-specific details. The key infrastructure components proposed as part of the installation of the RO Plant are described in greater detail in Chapter 2 of this BA Report.

Table 1.1: A detailed description of Matla Power Station Reverse Osmosis Plant

Province	Mpumalanga Province
District Municipality	Nkangala District Municipality
Local Municipality	eMalahleni Local Municipality
Ward number(s)	27
Nearest town(s)	Matla Power Station is located approximately 60km south of eMalahleni, 27km south of Ogies, 12km west of Kriel and 5km south-west of the Kriel Power Station.
Farm Name(s) & Portion Number (s)	Portion 4 of the Farm Bakenlaagte 84
SG 21 Digit Code (s)	T0IS0000000008400004
Centre coordinates of the <u>affected property</u>	26°17'30.72"S 29° 9'53.00"E
	Coordinates of the corner points of <u>the affected property</u> are included in Appendix H of the BA Report.
Current zoning	Industrial

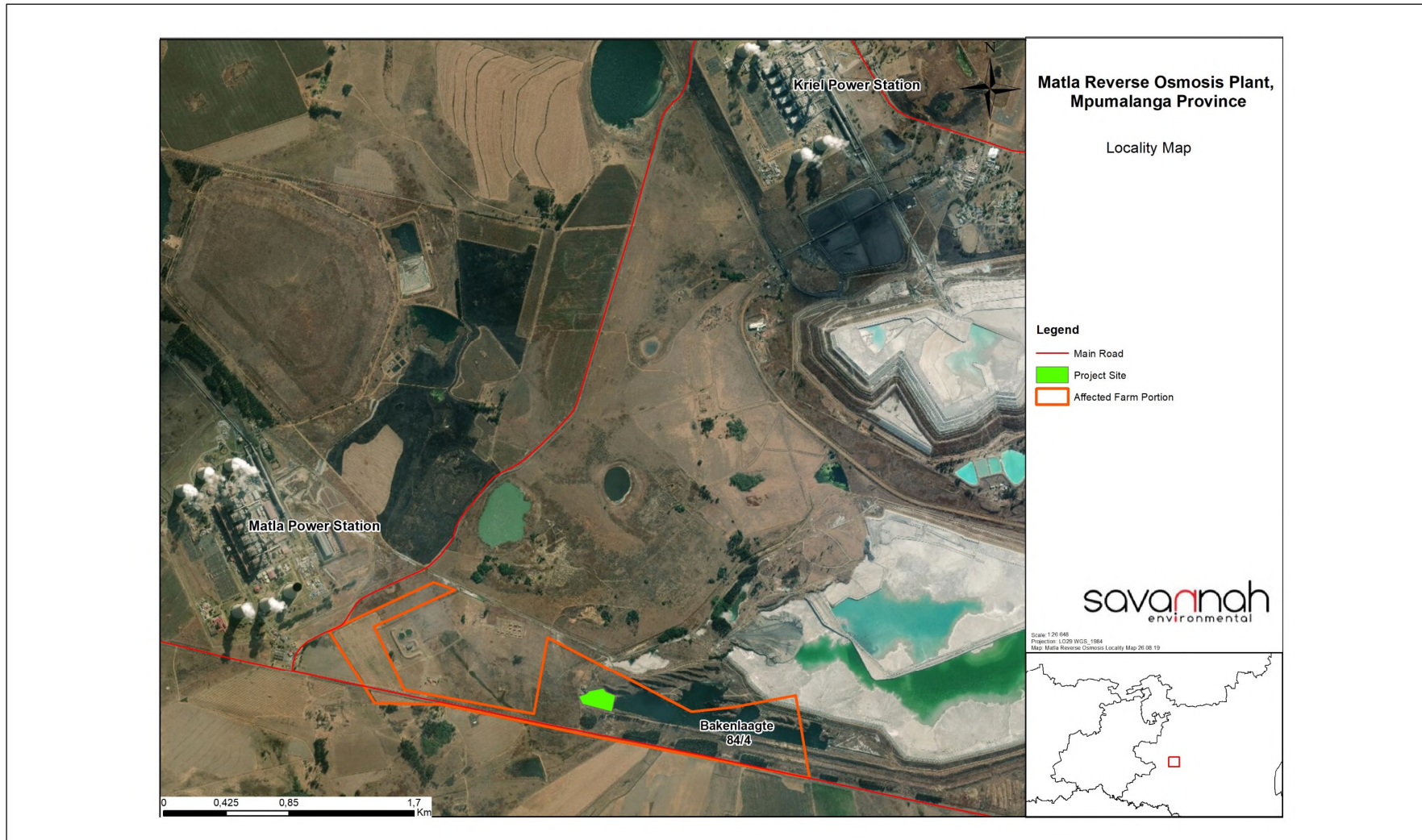


Figure 1.1: Locality map illustrating the location of the project site for the RO Plant being considered within the Basic Assessment (refer to **Appendix H** for A3 Maps).

1.2 Requirements for a Basic Assessment Process

The installation, operation and decommissioning of the RO Plant at the Matla Power Station is subject to requirements of the EIA Regulation, 2014 (as amended) and published in terms of Section 24(5) of the National Environmental Management Act (Act No. 107 of 1998) of 1998. The NEMA is the national legislation that provides for the authorisation of certain controlled activities known as "listed activities" and in terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed, and reported on to the Competent Authority (the decision-maker) charged by NEMA with granting of the relevant environmental authorisation. Therefore, in terms of the GN R324 and GN R327, the installation, operation and decommissioning of the RO Plant at the Matla Power Station is subject to a BA process in accordance with the EIA Regulations of 2014 (as amended) which were also promulgated under Sections 34 and 24D of the NEMA. The main listed activities triggered by proposed development is activities 25 and 31(i) which relate to, '*The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2 000 cubic metres but less than 15 000 cubic metres*' and '*The decommissioning of existing facilities, structures or infrastructure for any development and related operation or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014*'. Due to the triggering of activities 25 and 31(i) of GN R327, a BA process must be undertaken in support of an application for environmental authorisation for the project.

1.3 Overview of the Basic Assessment (BA) Process

A BA is an effective planning and decision-making tool for the project developer as it allows for the identification and management of potential environmental impacts. It provides the opportunity for the developer to be forewarned of potential environmental issues and allows for resolution of the issues reported on in the BA Report as well as dialogue with interested and affected parties (I&APs).

The BA process involves the identification and assessment of environmental positive and negative (direct, indirect, and cumulative) impacts as well as public participation. This includes detailed specialist investigations, where required, and consultation with interested and affected parties (I&APs). Following the review and comment period of the BA Report and Environmental Management Programme (EMPr), a Final BA Report and the EMPr is submitted to the Competent Authority for decision-making.

The need to comply with the requirements of the EIA Regulations ensures that comprehensive and independent environmental studies are undertaken such that the competent authority is provided with the opportunity to consider the potential environmental impacts of a project early in the project development process and to assess if potential environmental impacts can be avoided, minimised or mitigated to acceptable levels.

1.4 Objectives of the Basic Assessment Process

Appendix 1 of the EIA Regulations, 2014 (as amended), contains the objectives to be achieved through the undertaking of a BA process. The following objectives have been considered, undertaken and achieved through a consultative process within this BA Report for the Matla Power Station Reverse Osmosis Plant:

- » The identification and consideration of the policies and legislative context associated with the location of the project site identified for the proposed development and the way in which the installation and operation of the RO Plant responds to the relevant policies and legislative context.
- » The consideration of the need and the desirability for the installation and operation of the RO Plant.
- » The identification and consideration of the nature, consequence, extent, duration and probability of the impacts associated with the installation and operation of the RO Plant, as well as the degree to which the potential impacts can be reversed, result in irreplaceable loss of resources and be avoided, managed or mitigated.
- » Motivation for the installation, operation and decommissioning of the RO Plant at the Matla Power Station.
- » Consideration and identification of the environmental sensitivities to provide input in terms of measures to avoid, manage and mitigate the impacts and the residual risks that need to be managed and monitored.

The release of the BA Report for a 30-day review and comment period provides stakeholders with an opportunity to review and provide input in terms of potential issues and concerns that may be associated with the installation and operation of the RO Plant at the Matla Power Station. The Final BA Report for submission to the DEA will consider and incorporate comments and responses raised during the review period of the BA Report. The DEA will take the comments and responses into consideration in their decision-making of the application for an environmental authorisation.

1.5 Details of the Environmental Assessment Practitioner and Expertise to conduct the BA process

In accordance with Regulation 12 of the 2014 EIA Regulations (GN R326) Eskom Holdings SOC Ltd has appointed Savannah Environmental (Pty) Ltd (Savannah Environmental) as the independent Environmental consultant to undertake the Basic Assessment and prepare the BA Report for the Matla Power Station Reverse Osmosis Plant. Neither Savannah Environmental nor any of its specialist subconsultants are subsidiaries of, or are affiliated to Eskom Holdings SOC Ltd. Furthermore, Savannah Environmental does not have any interests in secondary development that may arise out of the authorisation of the installation and operation of the RO Plant at the station.

Savannah Environmental is a leading provider of integrated environmental and social consulting, advisory and management services with considerable experience in the fields of environmental assessment and management. The company is wholly woman-owned (51% black woman-owned) and is rated as a Level 2 Broad-based Black Economic Empowerment (B-BBEE) Contributor. The company was established in 2006 with a clear objective to provide services to the infrastructure development sector. Savannah Environmental benefits from the pooled resources, diverse skills and experience in the environmental field held by its team that has been actively involved in undertaking environmental studies for a wide variety of projects throughout South Africa and neighbouring countries. Strong competencies have been developed in project management of environmental processes, as well as strategic environmental assessment and compliance advice, and the assessment of environmental impacts, the identification of environmental management solutions and mitigation/risk minimising measures.

The Savannah Environmental team has considerable experience in environmental impact assessments and environmental management and has been actively involved in undertaking environmental studies for a wide variety of projects throughout South Africa, including those associated with infrastructure development projects.

The Savannah Environmental team in this project includes:

- » **Reuben Maroga** - the principal author of this report. He holds a Bachelor degree in Environmental Management and an Honours degree in Geology and has 2.5 years of experience in the environmental management field. His key focus is on undertaking environmental impact assessments, public participation, environmental management plans and programmes.
- » **Gideon Raath** - the co-author of this report and the registered EAP for the BA process for this project. He holds an MSc degree in Environmental Management and Geography from the University of Stellenbosch. He has 5 years of experience consulting in the environmental field. His competencies are in environmental impact assessments, mainly within the renewable energy (wind and solar) sector, as well as for infrastructure (roads, water pipelines and power line) related projects.
- » **Jo-Anne Thomas** is a Director at Savannah Environmental (Pty) Ltd and the project manager for this project. Jo-Anne holds a Master of Science Degree in Botany (M.Sc. Botany) from the University of the Witwatersrand and is registered as a Professional Natural Scientist (400024/2000) with the South African Council for Natural Scientific Professions (SACNASP). She has over 20 years of experience in the field of environmental assessment and management, and the management of large environmental assessment and management projects. During this time, she has managed and coordinated a multitude of large-scale infrastructure EIAs and is also well versed in the management and leadership of teams of specialist consultants, and dynamic stakeholders. Jo-Anne has been responsible for providing technical input for projects in the environmental management field, specialising in Strategic Environmental Advice, EIA studies, environmental permitting, public participation, EMPs and EMPrs, environmental policy, strategy and guideline formulation, and integrated environmental management (IEM). Her responsibilities for environmental studies include project management, review and integration of specialist studies, identification and assessment of potential negative environmental impacts and benefits, and the identification of mitigation measures, and compilation of reports in accordance with applicable environmental legislation.
- » **Nicolene Venter** – Board Member of IAPSA (International Association for Public Participation South Africa. She holds a Higher Secretarial Diploma and has over 21 years of experience in public participation, stakeholder engagement, awareness creation processes and facilitation of various meetings (focus group, public meetings, workshops, etc.). She is responsible for project management of public participation processes for a wide range of environmental projects across South Africa and neighbouring countries.

Curricula Vitae (CVs) detailing Savannah Environmental team's expertise and relevant experience are provided in **Appendix A**.

1.6 Screening Tool Assessment

In terms of GN R960 (promulgated on 5 July 2019) and Regulation 16(1)(b)(v) of the 2014 EIA Regulations (as amended), the submission of a Screening Report generated from the national web based environmental screening tool is compulsory for the submission of applications in terms of Regulation 19 and 21 of the 2014 EIA Regulations.

The requirement for the submission of a Screening Report (**Appendix F**) for the proposed development is applicable as it triggers Regulation 19 of the 2014 EIA Regulations (as amended). **Table 1.2** provides a summary of the specialist assessment requirements identified for the project site in terms of the screening tool and responses to each assessment requirement based on the nature and extent of the project.

Table 1.2: Specialist Assessment requirements identified in terms of the national web based environmental screening tool

Specialist Assessment	Sensitivity rating as per the online tool	Project Team Response
Agriculture Combined Sensitivity	High	The identified study <u>project site</u> for the RO Plant and the associated infrastructure is located within the existing footprint of the Matla Power Station and is currently zoned industrial. The area has largely been disturbed as a result of the development of the Pump House near the Final Cut-Off Dam and the pipeline network which transports ash slurry to the Ash Dam. As a result of the currently land use, the area is not considered to be suitable for agricultural activities.
Aquatic	Low	From an assessment of the site, the low sensitivity of the area from an aquatic perspective is confirmed. Furthermore, the proponent has commenced with an application of an amendment to the existing water use licence (Appendix I of the BA Report) to include the activities associated with the proposed development.
Civil Aviation	High	The proposed RO Plant is associated with a low height. Therefore, it will not pose an aviation risk to aircraft in the area and is not required to be registered as an obstacle in terms of the Aviation Act.
Defence	Low	The Matla Power Station is a National Key Point with no military facilities. Therefore, the sensitivity assessment of the Screening Report is considered to be inaccurate and it is concluded that this study is not required.
Terrestrial Biodiversity	Very High	From the site assessment undertaken, the sensitivity assessment has been confirmed to be low due to the disturbed nature of the site. Furthermore, the <u>project site</u> of the RO Plant is located within an area that has been extensively transformed as a result of previous developments (i.e. development of the Pump House and the Pipeline) and continues to be transformed by on-going activities in the area. Therefore, no specialist assessment is considered to be required.

1.7 Details of the Independent Specialist

In terms of the findings of the Screening Report and based on the legislative requirements of the National Heritage Resources Act, a heritage specialist has been appointed as part of the project team and has provided input into this BA Report (refer to **Table 1.3**).

Table 1.3: Specialists which form part of the BA process project team. Curricula Vitae of the Specialist Team is included in **Appendix A** of the BA Report.

Company	Specialist Area of Expertise	Specialist Name
PGS Heritage	Heritage Impact Assessment	Wouter Fourie
	Palaeontology Desktop Study	Elize Butler

CHAPTER 2: PROJECT DESCRIPTION

This chapter provides an overview for the Matla Reverse Osmosis Plant and details the project scope, which includes the installation, operation and decommissioning of the RO Plant within Portion 4 of the Farm Bakenlaagte 84. This chapter also details the need and desirability of a proposed development in the context of the preferred location.

2.1. Legal Requirements as per the EIA Regulations, 2014 (as amended)

This chapter of the BA report includes the following information required in terms of the EIA Regulations, 2014 (as amended) Appendix 1: Content of Basic Assessment reports:

Requirement	Relevant Section
3(d)(ii) a description of the scope of the proposed activity, including a description of the activities to be undertaken including associated structures and infrastructure	A description of the scope of the proposed activity, including a description of the activities to be undertaken including associated structures and infrastructure are included in section 2.2 – 2.4.
3(f) a motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location.	A motivation for the need and desirability for the proposed RO Plant, including the need and desirability of the preferred location is included in section 2.3, 2.4.1 and 2.4.2.

2.2 Nature and Extent of the Matla Power Station Reverse Osmosis Plant

Eskom Holdings SOC Limited is proposing the installation, operation and decommissioning of a RO Plant on a site near the Ash Dam at the Matla Power Station in the Mpumalanga Province. The RO Plant will consist of the following components:

- » Reverse Osmosis Modules;
- » Filtration Skids;
- » A Sulphuric Acid Tank;
- » A pipeline to connect the various components of the RO Plant to the Final Cut-off Dam;
- » Concrete support structures (including slab) for the RO Plant Infrastructure;
- » Chemical Stores;
- » Security Fencing; and
- » Electricity distribution boards.

The project site considered within this BA process is heavily modified due to anthropogenic disturbance at the station as a result of previous developments (i.e. construction of the Ash Dam and the Pump House, etc.). The affected property is approximately 107ha in extent and will accommodate the project site identified for the installation and operation of the RO Plant. Construction of the RO plant will take approximately 6 months. The RO Plant will be temporary and will be operated for a maximum period of three (3) years.

Existing infrastructure within the vicinity of the project site identified for the installation and operation of the RO Plant include the Final Cut-off Dam, a Pump House and an Auxiliary Building.

2.2.1 Reverse Osmosis Process

The RO Plant will be located ~890m west of the Ash Dam and 77m east of the Final Cut-off Dam. The RO Plant will consist of two (2) separate reverse osmosis modules. The first module of the RO Plant will have a treatment capacity of 3 130m³/day with a recovery rate of 80% (which is equivalent to 2500m³ of good permeate flow) per day. The second module will have a treatment capacity of 1 250m³/day with a recovery rate of 80% (which is equivalent to 1 010m³ of good permeate flow per day). The applicant anticipates the plant to at least produce 3 000m³ of good permeate flow per day over a three (3) year period within which the plant will be operational. Furthermore, the plant is anticipated to produce 900m³ of waste⁴ which will be transported to and stored at the Ash Dam or at any licensed disposal facility.

The treatment process of the RO Plant will occur in the following sequence (refer to **Figure 2.2**):

- » Water from the Final Cut-off Dam will be pumped by pumps installed on a floating jetty into the RO Plant.
- » Sulphuric acid is injected into the feedwater to lower the pH of the water to desired pH levels of between 7 – 8.
- » Following the pH adjustment, the feed water will be filtered through three (3) granular activated carbon (GAC) filters which will remove any organic compounds from the water.
- » Following the GAC filtration, the feed water will be split between two (2) Maddox Filtration Skids. The function of the skids is to remove suspended solids as well as aluminium from the feed water. The filtered water from the first Maddox unit (Maddox 1) will be discharged into a buffer tank installed inside the Maddox 1 container while the filtered water from the second Maddox unit (Maddox 2) will be discharged into a separate buffer tank installed in the RO Plant area. The feed water discharged from the Maddox 1 unit is pumped to the first RO module, that will be designed to produce 2500m³ at a recovery rate of 80%.
- » The filtered water from the Maddox 2 will be pumped from the buffer storage tank to the second RO module which will be designed to produce at least 1010m³ of permeate flow per day at a recovery rate of 80%.

The permeate product from the two (2) RO modules will be discharged into a product water buffer tank from where the water will be transported back to the power station for use in domestic, industrial and ash slurry applications. The waste generated as a result of the treatment process will be transported and stored at the Ash Dam.

⁴The anticipated waste from the RO Plant during the operation phase is anticipated to have a total dissolved solid (TDS) content not exceeding 50 000ppm.

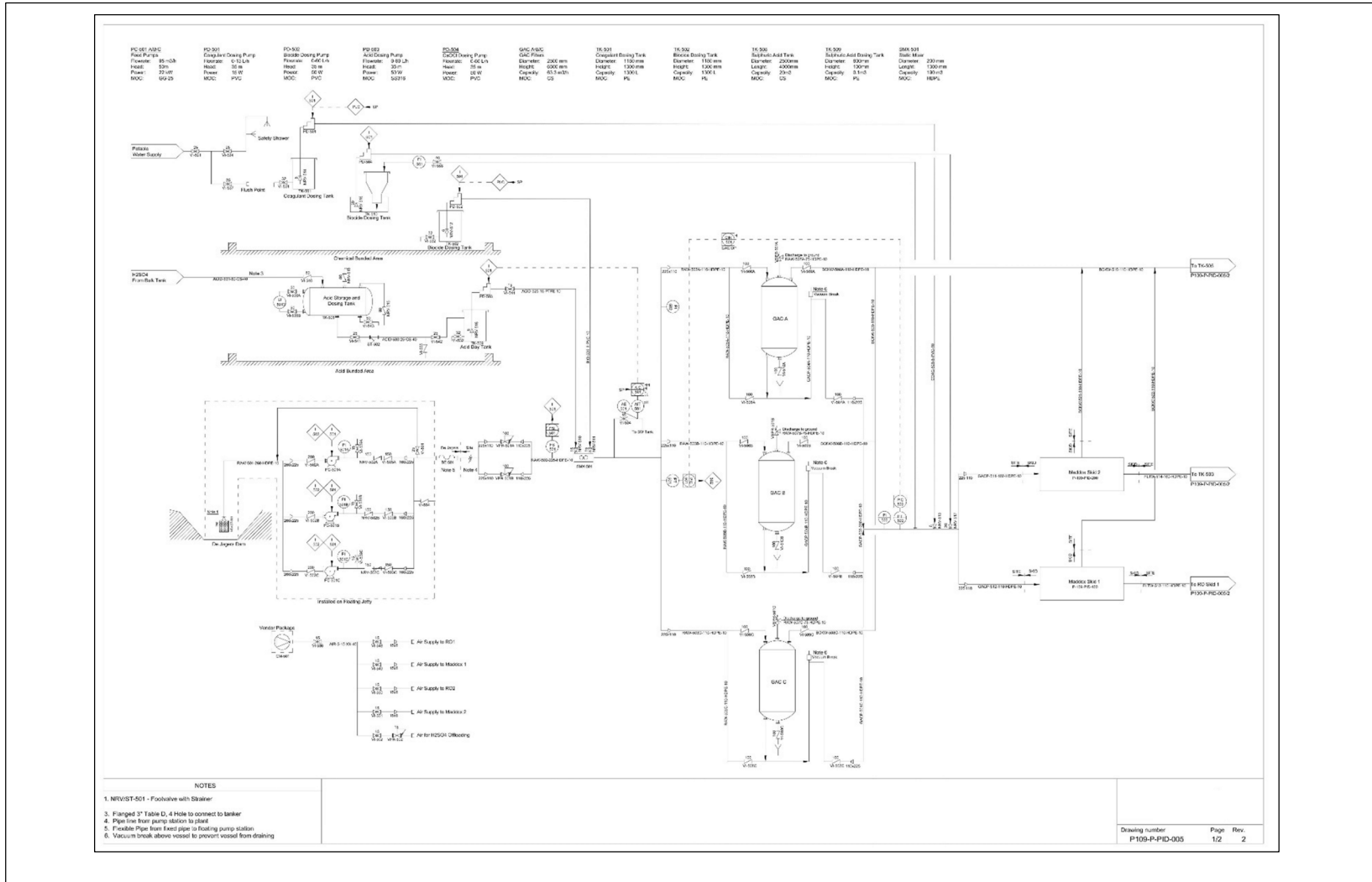


Figure 2.1: A simplified diagram illustrating the process-flow for the RO Plant (refer to **Appendix H** for an A3-sized diagram).

2.2.2 Project Site Status and Associated Infrastructure

The project site identified for the installation of the RO Plant can be accessed by a network of compacted gravel roads within the footprint of the station. These roads already provide access to the Ash Dam and the Pump House located adjacent to the project site for the RO Plant. Current activities taking place within the vicinity of the Ash Dam and the Final Cut-off Dam include the on-going transport of ash slurry at the Ash Dam and the storage of the trench solution from the Ash Dam in the Final Cut-off Dam. Within the Final Cut-off Dam there is a floating jetty which is used to pump water from the dam back to the station for further use in the ash slurry generation process.

Figure 2.2 below provides a view of the Final Cut-off Dam near the Ash Dam within the footprint of the Matla Power Station. The project site for the RO Plant is located to the west of the area shown below.



Figure 2.2: A view of the Final Cut-off Dam and the Ash Dam at the Matla Power Station



Figure 2.3: Photograph showing the floating jetty/pump used at present to pump water from the Final Cut-off Dam to the Cooling Towers of the power station. The project site identified for the installation of the RO Plant is located to the west of this location.



Figure 2.4: A view of the existing access road located adjacent to the Final Cut-off Dam and the Pump House.

2.3 Need and Desirability for the installation and operation of the RO Plant

At the Matla Power Station, the wet ash system is used for ash removal. In this system, coarse and fly ash are mixed with water to create a slurry, which is then pumped to the ash dam. At the ash dam, the free water is then removed from the top of the dam by a penstock. The remaining water will go through filter drains into a solution trench. The water collected by the penstock and the solution trench is then transported to the Final Cut-off Dam. From the Final Cut-off Dam, the water is then pumped back to the Ash Water Return (AWR) Reservoir where it is re-used in the ash system to transport ash slurry to the ash dam. Although, the correct management of this system ensures minimal water is consumed, various issues have compelled the station to use emergency makeup water from different sources for ash slurry transport. By using these additional sources, the water level in the Final Cut-off Dam has started increasing at an alarming rate, thus creating a need to reduce the current water level at the Final Cut-off Dam by using the RO technology to treat the water while the station optimises its water management strategy. The purpose of the RO Plant development is to treat the Ash Water Return (AWR) from the Ash Dam so as to reduce the spillage risk currently presented by the Final Cut-off Dam.

Therefore, Eskom is proposing the installation of the RO Plant for the treatment of water contained within the Final Cut-off Dam with the aim of reducing the spillage risk of the dam, as well as to treat the water to a quality acceptable for use across various applications at the station, including in the cooling tower system. The installation of the RO Plant at the station will reduce the spillage risk presented by the water level of the Final Cut-off Dam. The plant will be operated for a maximum period of three (3) years following which it will be decommissioned.

2.4. Project Site Alternatives

The proponent identified a preferred project site for the installation, operation and decommissioning of the RO Plant. The preferred project site is proximal to the Final Cut-off Dam, where the feed water required for treatment at the plant will be pumped using a series of pumps placed on a floating jetty inside the dam. This area is regarded as being preferred for the proposed development as it is near the Final Cut-off Dam, therefore, it provides an ease of connection for the plant and the associated infrastructure required to treat the feed water.

The following provides motivation as to why the project site has been identified by the applicant as the preferred area for the installation and operation of the RO Plant:

- » The area is preferred from a technical perspective as it is sufficient in extent, covering an area of approximately 1.66ha, which is sufficient for the installation of the RO Plant and the associated infrastructure as well as for the movement of equipment and vehicles during the installation, operation and decommissioning phases of the plant;
- » The preferred area is only located 80m east of the Final Cut-off Dam, and therefore, the plant will require a shorter network of pipes to transport the feedwater from the dam to the plant; and
- » The area is also located adjacent to the existing pipelines used for the transportation of water from the dam to the generating units for ash slurry generation, which allows for an easy tie-in of the plant into the pipelines for the transport of 3 000m³ ⁵of permeate flow from the plant to the station.

⁵ The volume of treated water from the RO Plant to be transported to the power generating units per day. Approximately 900m³ of waste with a content of TDS not exceeding 50 000ppm will be transported from the RO Plant and stored at the Ash Dam.



Figure 2.5: A satellite image illustrating the proximity of the preferred project site to the existing pump station, the Final Cut-off Dam where the required water will be sourced from and the existing pipeline network required for the transport of the permeate flow back to the station.

2.4.1 Activity Alternatives

A number of activity alternatives were considered by Eskom to address the issue relating to the water within the cut-off dam.

a) Increasing the evaporative footprint of the existing Ash Dam

This alternative involves increasing the evaporative footprint of the existing Ash Dam. The disadvantage with this approach is the extensive footprint that will be required for the extension of the Ash Dam. The current footprint of the Ash Dam is surrounded by provincial roads which could be impacted by this extension. Considering the prevailing natural and spatial conditions, this alternative was not considered to be a feasible alternative.

b) Discharge of Polluted Water

The option of discharging the water contained in the Final Cut-off Dam into the surrounding environment was considered. This approach would not be in line with Eskom's Zero Liquid Effluent Discharge (ZLED) philosophy and the Water Use Licence issued for the station and would therefore result in adverse impacts on the surrounding natural environment and agricultural areas. This alternative was therefore not considered to be feasible.

2.4.2 Technology Alternatives

Numerous technology alternatives were considered by Eskom Holdings SOC Limited for the selection of an optimal process for reducing the level of water in the Final Cut-off Dam.

a) Lime Softening

The process lacks synergy with the demineralised water production process, and it is associated with high capital costs. However, while it assists with the removal of salts from the concentrated cooling water, the advantage of using this option is not as significant when compared with a RO Plant especially when taking into consideration the capital costs associated with the establishment of a Lime Treatment Plant.

b) Electro Deionisation Reversal (EDR)

The quality of the product produced from this process would not be ideal and suitable for demineralised water production. In addition, this process is also associated with high set up costs.

c) Reverse Osmosis Plant ('Preferred Option')

A RO Plant allows for the recycling of water in the system, which will address the water situation within the Final Cut-off dam and will substantially reduce Matla Power Station's water consumption and the risk of spillage presented by the Final Cut-off Dam and allow the station and Eskom an opportunity to optimise their water management strategy. Furthermore, the quality of the permeate produced from this process would be better suited for in domestic, industrial and ash slurry generation uses at the station. In addition, the set-up costs for a RO Plant are relatively low in comparison to other technology options considered by Eskom and the station. The RO Plant option presents more opportunities than drawbacks in comparison to

other options. For this reason, the RO Plant option was selected as the preferred technical alternative and is the only option that is considered in this BA Report.

2.5 The 'Do Nothing' Alternative

The EIA Regulations, 2014 (as amended) require that within any BA Process, the 'Do Nothing' alternative for a proposed development be considered. The do-nothing' alternative (i.e. no-go alternative) is the option of not constructing the RO Plant and the associated infrastructure at the Matla Power Station. Should this alternative be selected, there would be no potential environmental impacts on the project site due to the installation, operation and decommissioning activities of the RO Plant. Therefore, the selection of the 'Do Nothing' alternative would mean the spillage risk presented by the Final Cut-off Dam to the surrounding environment remains. Furthermore, this also means that the water cannot be treated to a quality that is acceptable for use at the station. Therefore, the station would lose the opportunity to minimise the spillage risk and also improve its environmental integrity.

CHAPTER 3: APPROACH TO UNDERTAKING THE BASIC ASSESSMENT PROCESS

In terms of the EIA Regulations, 2014 (as amended), published in terms of Section 25D of NEMA, the installation, operation decommissioning of the RO Plant at the Matla Power Station requires Environmental Authorisation in accordance with the EIA Regulations of 2014 (as amended). Due to the triggering of activities 25 and 31(i) of GN R327, a BA process must be undertaken in support of the application for an Environmental Authorisation.

The BA process aims at identifying and describing potential environmental issues associated with the installation, operation of the RO Plant and the associated infrastructure at the Matla Power Station. The process aims to ensure that a comprehensive assessment is provided to the competent authority and I&APs regarding the potential impacts associated with the commissioning of the RO Plant at the power station. Furthermore, a comprehensive consultation process has commenced, and includes I&APs, the competent authority, adjacent landowners/occupiers, relevant Organs of State Departments, ward councillors and other key stakeholders. This chapter serves to outline the BA process followed to date.

This Chapter of the BA Report includes the following information required in terms of Appendix 1:

Requirement	Relevant Section
3(d)(i) a description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for.	A description of the scope of the installation and operation of the RO Plant including all the listed activities is included in section 3.1 and Table 3.1.
3(h)(ii) details of the public participation process undertaken in terms of Regulation 41 of the Regulations, including copies of the supporting documents and inputs.	The details of the Public Participation Process undertaken for the RO Plant are included and described in section 3.4.2.
3(h)(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives.	The methodology used to assess the significance of the environmental impacts associated with the installation and operation of the RO Plant is included in section 3.2.3.

3.1 Relevant legislative permitting requirements

The legislative permitting requirements applicable to the installation and operation of the RO Plant at the Matla Power Station as identified at this stage of the BA process, are described below.

3.1.1 National Environmental Management Act (Act No. 107 of 1998)

In terms of the 2014 EIA Regulations (as amended), the proposed development triggers listed activities within GN R327 and GN R324 of December 2014. **Table 3.1** below details the listed activities in terms of the 2014 EIA Regulations (as amended) that applies to the installation and operation of the RO Plant and which an application for environmental authorisation has been submitted. This table further includes a description of the specific project activity which relates to the applicable listed activity.

Table 3.1: Listed Activity as per the 2014 EIA Regulations (as amended) that are triggered by the proposed installation and operation of the RO Plant at Matla Power Station near Kriel in the Mpumalanga Province.

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice):	Describe each listed activity as per project description
GN R327	14	<p>The development and related operation 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 meters or more but not exceeding 500 cubic meters.</p> <p><i>The operation of the RO Plant will require a Sulphuric Acid Storage Tank which will be used to supply the plant with acid for the pre-treatment process of the <u>ash water stored in the Final Cut-off Dam</u>. Furthermore, other dangerous chemicals and goods, <u>such as oils and lubricants</u> will be required during the construction and operation phase of the RO Plant. The capacity of all dangerous substances and <u>chemicals</u> to be stored on site will not exceed 500m³.</i></p>
GN 327	25	<p>The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2 000 cubic metres but less than 15 000 cubic metres.</p> <p><i>The operation of the RO Plant pertains to the treatment of ash water in the Final Cut-off Dam from the Ash Dam at Matla Power Station. The RO Plant will consist of two (2) RO modules which will have a combined throughput capacity of 4 380m³ per day. The permeate flow (the product from the RO process) will be transported back to the station via the existing pipeline network for use at the station.</i></p>
GN R327	31(i)	<p>The decommissioning of existing facilities, structures or infrastructure for –</p> <ol style="list-style-type: none"> 1. any development and related operation activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014. <p><i>The RO Plant will be operational for a maximum period of three (3) years following which it will be decommissioned.</i></p>

3.1.2 National Water Act (Act No. 36 of 1998)

In accordance with the provisions of the National Water Act (NWA) (Act No. 36 of 1998), all water uses must be licensed with the Competent Authority (i.e. the Department of Water and Sanitation (DWS)). Water Use is defined broadly and includes taking and storing water, activities which reduce stream flow, waste discharge and disposal, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes and recreation.

The project site identified for the development of the RO Plant is located within the regulated area of a wetland, which is located 140m south-east of the project site. Eskom has an existing Water Use License (WUL) for the Matla Power Station (**Appendix I**). This WUL does not include the description of activities associated with the operation of the RO Plant at the station. Therefore, during the BA process, the applicant had submitted an application to DWS for a new WUL which will include activities triggered by the RO Plant development.

3.1.3 National Environmental Management Waste Act (Act No. 59 of 2008)

The project scope of the RO Plant does not include the construction of a waste disposal site. In addition, during the operation phase of the plant, it is anticipated that approximately 900m³⁶ of waste, as a result of the treatment process will be transported and stored at the Ash Dam, or where possible, at an appropriately licensed disposal facility.

3.2 Overview of the Basic Assessment Process

Key tasks undertaken for the BA process include:

- » Submission of the completed application for an integrated environmental authorisation in terms of the National Environmental Management Act (Act No. 107 of 1998).
- » Undertaking a public participation process in accordance with Chapter 6 of GN R326, and the Department of Environmental Affairs (2017), Public Participation guidelines in terms of NEMA EIA Regulations, Department of Environmental Affairs, Pretoria, South Africa (hereinafter referred to as "the Guidelines") in order to identify issues and concerns associated with the proposed project.
- » Preparation of a BA report and an EMPr in accordance with the requirements of Appendix 1 and Appendix 4 of GN R326.
- » 30-day public and authority review period of the BA report.
- » Compilation of a Comment and Responses (C&R) report detailing the comments raised by I&APs, addressing these comments in detail and finalisation of the BA report.
- » Submission of a final BA report to the DEA for review and decision-making.

The tasks are discussed in detail in the sub-sections below.

3.2.1 Authority Consultation and Application for Authorisation in terms of the 2014 EIA Regulations (as amended)

In terms of Section 24 of NEMA, the National Department of Environmental Affairs (DEA) has been determined as the Competent Authority for projects which require an integrated environmental authorisation and waste management licence.

Consultation with the regulating authorities (i.e. DEA) as well as with all other relevant Organs of State will continue throughout the BA process. To date, this consultation has included the following:

- » Submission of a completed application for the environmental authorisation

⁶ The waste is anticipated to have a content of less and equivalent to 50 000ppm of total dissolved solids (TDS).

- » Submission of the BA Report for review and comment by:
 - * The competent and commenting authorities.
 - * Organs of State that have jurisdiction in respect of the activity to which the application relates.

3.2.2 Public Participation Process

Public Participation is an essential and regulatory requirement for an environmental authorisation process and is defined by the requirements of Regulations 41 to 44 of the EIA Regulations 2014 (GN R326) (as amended). The sharing of information forms the basis of the public participation process and offers the opportunity for I&APs (Interested and Affected Parties) to become actively involved in the BA process from the outset. The public participation process is designed to provide sufficient and accessible information to I&APs in an objective manner. The public participation process affords I&APs opportunities to provide input into and receive information regarding the BA process in the following ways:

During the BA process:

- » provide an opportunity to submit comments regarding the project;
- » assist in identifying reasonable and feasible alternatives;
- » contribute relevant local information and knowledge to the environmental assessment;
- » allow registered I&APs to verify that their comments have been recorded, considered and addressed, where applicable, in the environmental investigations;
- » foster trust and co-operation;
- » generate a sense of joint responsibility and ownership of the environment; and
- » comment on the findings of the environmental assessments.

During the decision-making phase:

- » to advise I&APs of the outcome of the competent authority's decision, and how and by when the decision can be appealed.

The public participation process therefore aims to ensure that:

- » Information containing all relevant facts in respect of the application is made available to potential stakeholders and I&APs for their review.
- » The information presented during the public participation process is presented in such a manner, i.e. local language and technical issues, that it avoids the possible alienation of the public and prevents them from participating.
- » Public participation is facilitated in such a manner that I&APs are provided with a reasonable opportunity to comment on the project.
- » Various ways are provided to I&APs to correspond and submit their comments i.e. fax, post, email.
- » An adequate review period is provided for I&APs to comment on the findings of the BA Report.

In terms of the requirement of Chapter 6 of the EIA Regulations of December 2014, as amended, the following key public participation tasks are relevant for the current BA process:

- » Placement of a site notice at the boundary or on the fence of the site where the activity to which the application relates is or is to be undertaken.

- » Give written notice to:
 - (i) the owner or person in control of the land affected by the project (as this is not owned by the applicant);
 - (ii) the occupiers of the site where the activity is proposed to be undertaken;
 - (iii) owners and occupiers of land adjacent to the site where the activity is proposed to be undertaken;
 - (iv) the municipal councillor of the ward in which the site is situated;
 - (v) the municipality which has jurisdiction in the area; and
 - (vi) organ of state having jurisdiction in respect of any aspect of the activity;
- » Placement of an advertisement in one local newspaper (i.e. Witbank News).
- » Open and maintain a register of I&APs and Organs of State.
- » Release a BA Report for a 30-day review period.
- » Prepare a Comments and Responses (C&R) report which documents the comments received on the BA process and the responses provided by the project team.

In compliance with the requirements of Chapter 6: Public Participation of the EIA Regulations, 2014 (as amended), the following summarises the key public participation activities conducted to date.

i. Stakeholder identification and Register of Interested and Affected Parties

42. A proponent or applicant must ensure the opening and maintenance of a register of I&APs and submit such a register to the competent authority, which register must contain the names, contact details and addresses of –
- (a) All persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;
 - (b) All persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and
 - (c) All organs of state which have jurisdiction in respect of the activity to which the application relates.

I&APs have been identified through a process of networking and referrals, obtaining information from Savannah Environmental's existing stakeholder database, liaison with potentially affected parties in the greater study area and a registration process involving the completion of a reply form. Key stakeholders and affected and surrounding landowners have been identified and registered on the project database. Other stakeholders are required to formally register their interest in the project. An initial list of key stakeholders identified and registered is listed in **Table 3.2**.

Table 3.2: List of Stakeholders identified for the inclusion in the project database during the public participation process for the installation and operation of the RO Plant.

Organs of State
National Government Departments
Department of Environmental Affairs (DEA)
Department of Environmental Affairs (DEA): Biodiversity
National Department of Water and Sanitation (DWS)
Government Bodies and State-Owned Companies
South African Heritage Resources Agency (SAHRA)
Provincial Government Departments

Mpumalanga, Department of Agriculture, Land Reform and Rural Development

Regional Department of Water and Sanitation (DWS)

Mpumalanga Provincial Heritage Authority (MPHRA)

Local Government Departments

Nkangala District Municipality

eMalahleni Local Municipality

Landowners

Neighbouring Landowners

As per Regulation 42 of the EIA Regulations, 2014 (as amended), all relevant stakeholder and I&AP information has been recorded within a register of I&APs (refer to **Appendix C1** for a listing of the recorded parties). The register of I&APs contains the names, contact details and addresses of:

- » all persons who requested to be registered on the database in writing and disclosed their interest in the project;
- » all Organs of State which hold jurisdiction in respect of the activity to which the application relates;
- » all persons identified and approached through networking or a chain referral system to identify any other stakeholder (i.e. ratepayers associations); and
- » all persons who submitted written comments or attended meetings during the public participation process.

I&APs have been encouraged to register their interest in the BA process from the onset of the project, and the identification and registration of I&APs will be on-going for the duration of the BA process. The database of I&APs will be updated throughout the BA process and will act as a record of the I&APs involved in the public participation process.

ii. Advertisements and Notifications

- 40.(2)(a) Fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of –
- » (i) The site where the activity to which the application or proposed application relates is or is to be undertaken; and
 - » (ii) Any alternative site.
- 40.(2)(b) Giving written notice, in any of the manners provided for in section 47D⁷ of the Act, to –
- » (i) The occupiers of the site and, if the proponent or applicant is not the owner or person in

⁷ Section 47D of NEMA pertains to the delivery of documents, and states that:

(1) A notice or other document in terms of this Act or a specific environmental management Act may be issued to a person –

(a) By delivering it by hand;

(b) By sending it by registered mail –

(i) To that person's business or residential address; or

(ii) In the case of a juristic person, to its registered address or principal place of business;

(bA) By faxing a copy of the notice or other document to the person, if the person has a fax number;

(bB) By e-mailing a copy of the notice or other document to the person, if the person has an e-mail address; or

(bC) By posting a copy of the notice or other document to the person by ordinary mail, if the person has a postal address;

(c) Where an address is unknown despite reasonable enquiry, by publishing it once in the Gazette and once in a local newspaper circulating in the area of that person's last known residential or business address.

(2) A notice or other document issued in terms of subsection (1)(b), (bA), (bB), (bC) or (c) must be regarded as having come to the notice of the person, unless the contrary is proved."

- control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;
- » (ii) Owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;
 - » (iii) The municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;
 - » (iv) The municipality which has jurisdiction in the area;
 - » (v) Any organ of state having jurisdiction in respect of any aspect of the activity; and
 - » (vi) Any other party as required by the competent authority.
- 40.(2)(c) Placing an advertisement in –
- » (i) One local newspaper; or
 - » (ii) Any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
- 40.(2)(d) Placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii); and
- 40.(2)(e) Using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to –
- » (i) Illiteracy;
 - » (ii) Disability; or
 - » (iii) Any other disadvantage.

The BA process was announced with an invitation to the Organs of State, potentially affected and neighbouring landowners and general public to register as I&APs and to actively participate in the process. This was achieved via the following:

- » Placement of site notices announcing the BA process at visible points along the boundary of the project site, in accordance with the requirements of the EIA Regulations on 6 August 2019. Photographs and the GPS co-ordinates of the site notices are contained in **Appendix C2**.
- » BA process notification letters announcing the BA process, notifying Organs of State, potentially affected and neighbouring landowners, as well as registered stakeholders/I&APs of the commissioning of a Reverse Osmosis Plant, providing background information of the project and inviting I&APs to register on the project's database, were distributed via email on 7 October 2019. The evidence of the distribution of the process notification letters are contained in **Appendix C** of the BA Report.
- » BA process notification letters announcing the availability of the BA Report for a 30-day review and comment period were distributed on **23 January 2020**. The placement of an advertisement also announcing the availability of the BA Report for a 30-day comment and review period in the Witbank News newspaper on **24 January 2020**. The details of the newspaper advertisement placement are included in **Appendix C2** of the Final BA Report.
- » The BA Report for review was made available for review by I&APs for a 30-day review period from 24 January to 24 February 2020. CD and hard copy versions of the BA Report were circulated to Organs of State via courier at the commencement of the review period. The BA Report was also made available on the Savannah Environmental website (<https://www.savannahsa.com/public-documents/other/>) and a hard copy of the BA Report was placed at the Kriel Public Library. The evidence of distribution of the Report is included in Appendix C of the Final BA Report to be submitted to the DEA.

iii. Public Involvement and Consultation

In order to accommodate the varying needs of stakeholders and I&APs within the greater study area, as well as capture their views, comments, issues and concerns regarding the project, various opportunities have been and will continue to be provided to I&APs to note their comments and issues. I&APs are being consulted through the following means:

Table 3.3: Public involvement for the RO Plant development

Activity	Date
Distribution of the process notification and stakeholder reply form announcing the BA process and inviting I&APs to register on the project database.	7 October 2019
Placement of site notices on-site and in public places.	6 August 2019
Distribution of notification letters announcing the availability of the BA Report for review for a 30-day public review and comment period. These letters were distributed to Organs of State, Government Departments, Ward Councillors, landowners within the greater study area (including neighbouring landowners) and key stakeholder groups.	22 January 2020
Advertising of the availability of the BA Report for a 30-day review period in the Witbank News newspaper.	24 January 2020
30-day review period for the BA Report for comment.	24 January 2020 – 24 February 2020
On-going consultation (i.e. telephone liaison; e-mail communication) with all I&APs	Throughout BA Report 30-day review period

The purpose of the abovementioned consultation is to engage with key stakeholders to ensure that key requirements/comments are noted and addressed as part of the BA process. Records of all consultation undertaken are included in **Appendix C**.

iv. Registered I&APs entitled to comment on the BA Report and Plans

- 43.(1) A registered I&AP is entitled to comment, in writing, on all reports or plans submitted to such party during the public participation process contemplated in these Regulations and to bring to the attention of the proponent or applicant any issues which that party believes may be of significance to the consideration of the application, provided that the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.
- (2) In order to give effect to section 24O of the Act, any State department that administers a law relating to a matter affecting the environment must be requested, subject to regulation 7(2), to comment within 30 days.
- 44.(1) The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.
- (2) Where a person desires but is unable to access written comments as contemplated in sub regulation (1) due to –
- (a) A lack of skills to read or write;
 - (b) Disability; or
 - (c) Any other disadvantage;
- Reasonable alternative methods of recording comments must be provided for.

I&APs registered on the database have been notified by means of a notification letter (e-mail and registered mail) of the release of the BA Report for a 30-day public review period, invited to provide comment on the BA Report, and informed of the manner in which, and timeframe within which such comment must be made. The notification letter was distributed prior to the commencement of the 30-day review period, on **23 January 2020**. No notification has been received from the registered I&APs indicating their inability to issue provide comments on the project.

v. Identification and Recording of Comments

Comments raised by I&APs over the duration of the BA process have been synthesised into a Comments and Responses (C&R) Report which is included in **Appendix C6** of the Final BA Report. The C&R Report includes all written comments received and responses to the comments from members of the BA process project team and the applicant (Eskom Holdings SOC Limited) raised during the 30-day review period of the BA Report.

Written comments on the BA Report were submitted by Organs of State including, the South African Heritage Resources Agency (SAHRA), Department of Water and Sanitation and the Emalahleni Local Municipality. No written comments were received from registered I&APs during the 30-day review and comment period of the BA Report.

The table below provides a summary of the main issues raised by Organs of State and I&APs during the 30-day review period of the BA Report.

Summary of the main issues raised by the Organ of State and Interested and Affected Parties

SAHRA indicated that should there be any evidence of archaeological sites or remains, fossils or other categories of heritage resources during the proposed development, SAHRA APM Unit (Nokukhanya Khumalo/Phillip Hine 021 202 8654) must be alerted as per section 35(3) of the NHRA. The agency further indicated that should unmarked human burials be uncovered during the proposed development, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/Mimi Seetelo 012 320 8490), must be alerted immediately as per section 36(6) of the NHRA.

The eMalahleni Local Municipality indicated that the BA Report should consider the municipal by-laws which pertained to noise, waste generation and air quality. The Municipality further requested that the quantities of hazardous waste required for the proposed development be made clear in the BA Report. :

The Department of Environmental Affairs requested the project team to ensure that all the activities applied for

Summary of response from the EAP

Objective 4 (Protection of Archaeological & Palaeontological Resources) of the Construction Phase EMPr, includes conditions which require the applicant to immediately notify the BGG and the APM should fossils, archaeological or human remains be discovered within the project site during the project life cycles of the proposed development.

The project team indicated that Chapter 3 and Table 3.5 of the Final BA Report identifies the listed municipal by-laws and their application to the proposed development of the RO Plant. In addition, Table 3.1 in the Final BA Report includes Listed Activity 14 of Listing Notice 1 (GNR 327) which pertains to the development and operation of infrastructure or facilities that will require the storage or handling of dangerous goods or substances. The Final BA Report indicates that the threshold of the storage of dangerous goods required for the proposed RO Plant will not exceed 500m³.

The project team confirmed that all the listed activities applied for in the application form and included in

are relevant to the proposed development and the public participation process undertaken for the project adheres to the EIA Regulations, 2014 (as amended).

Chapter 3 and Table 3.1 of the Final BA Report are applicable to the proposed development. Furthermore, the project team indicated that the public participation process undertaken for the proposed development adheres to the conditions of the EIA Regulations, 2014 (as amended).

In accordance with the EIA Regulations, the proof of newspaper advertisement and placement of site notices within the vicinity of the project site and the affected property is included in **Appendix C2** of the Final BA Report.

The proof of notification to I&APs and organs of state announcing the availability of the BA Report for a 30-day review and comment period is included in **Appendix C3** and **C4** of the Final BA Report. Written comments received from organs of state and I&APs on the proposed development are included in **Appendix C5** of the Final BA Report.

The Department of Water and Sanitation indicated that the proposed development would be constructed within 500m of a watercourse; therefore, this triggered Section 21(c) and (i) in terms of the National Water Act of 1998.

The project team indicated that the applicant had commenced with and submitted an application for a Water Use Licence to DWS in accordance with the guidelines of the NWA. The submitted application included activities triggered by the installation and operation of the RO Plant at Matla Power Station.

3.2.3 Assessment of Issues Identified through the BA Process

In terms of the findings of the Screening Report and based on the legislative requirements of the National Heritage Resources Act, a heritage specialist and a palaeontological specialist were appointed to provide input into this BA Report (refer to **Table 3.4**).

Table 3.4: Specialists which form part of the BA process project team. Curricula Vitae of the Specialist Team is included in **Appendix A** of the BA Report.

Company	Specialist Area of Expertise	Specialist Name
PGS Heritage	Heritage Impact Assessment	Wouter Fourie
	Palaeontology Desktop Study	Elize Butler

Specialist studies considered direct and indirect environmental impacts associated with the development of the RO Plant and the associated infrastructure. Issues were assessed in terms of the following criteria:

- » The **nature**, a description of what causes the effect, what will be affected, and how it will be affected;
- » The **extent**, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score of between 1 and 5 is assigned as appropriate (with a score of 1 being low and a score of 5 being high);
- » The **duration**, wherein it is indicated whether:
 - * The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
 - * The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
 - * Medium-term (5–15 years) – assigned a score of 3;

- * Long term (> 15 years) - assigned a score of 4;
- * Permanent - assigned a score of 5.
- » The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
 - * 0 is small and will have no effect on the environment;
 - * 2 is minor and will not result in an impact on processes;
 - * 4 is low and will cause a slight impact on processes;
 - * 6 is moderate and will result in processes continuing but in a modified way;
 - * 8 is high (processes are altered to the extent that they temporarily cease);
 - * 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- » The **probability of occurrence**, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:
 - * Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
 - * Assigned a score of 2 is improbable (some possibility, but low likelihood);
 - * Assigned a score of 3 is probable (distinct possibility);
 - * Assigned a score of 4 is highly probable (most likely);
 - * Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
- » The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high;
- » The **status**, which is described as either positive, negative or neutral;
- » The degree to which the impact can be reversed;
- » The degree to which the impact may cause irreplaceable loss of resources;
- » The degree to which the impact can be mitigated.

The **significance** is determined by combining the criteria in the following formula:

$S = (E+D+M) P$; where

S = Significance weighting.

E = Extent.

D = Duration.

M = Magnitude.

P = Probability.

The **significance weightings** for each potential impact are as follows:

- » **< 30 points:** Low (i.e. where this impact would not have a direct influence on the decision to develop in the area);
- » **30-60 points:** Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated);
- » **> 60 points:** High (i.e. where the impact must have an influence on the decision process to develop in the area).

Eskom Holdings SOC Limited, as the proponent has the responsibility to avoid or minimise impacts and plan for their management (in terms of the EIA Regulations, 2014 (as amended)), the mitigation of significant impacts is discussed. An assessment of impacts with mitigation is made in order to demonstrate the effectiveness of the proposed mitigation measures. An Environmental Management Programme (EMPr) is included as **Appendix G**.

3.3 Assumptions and Limitations of the BA Process

The following assumptions and limitations are applicable to this BA process:

- » All information provided by the applicant and I&APs to the project team was correct and valid at the time it was provided.
- » It is assumed that the study area and project site identified for the installation of the RO Plant by the proponent, Eskom Holdings SOC Limited, represents a technically suitable site for the establishment of the RO Plant which is based on the design undertaken by the Eskom technical team for the project.
- » This BA Report and its investigations are project specific. Since no feasible alternatives were provided, none have been investigated.

Refer to the specialist studies in **Appendix D-E** for specialist study specific limitations.

3.4 Legislation and Guidelines that have informed the preparation of this Basic Assessment Report

The following legislation and guidelines have informed the scope and content of this BA Report:

- » National Environmental Management Act (Act No. 107 of 1998);
- » EIA Regulations of December 2014, published under Chapter 5 of NEMA (as amended in GNR R326 in Government Gazette No 40772 of April 2017); and
- » Department of Environmental Affairs (2017), Public Participation Guidelines in terms of NEMA EIA Regulations.

Table 3.5 provides an outline of the legislative permitting requirements applicable to the proposed RO Plant at the Matla Power Station as identified at this stage in the BA process.

Table 3.5: Relevant policies, legislation, guidelines, and standards applicable to the installation and operation of the RO Plant

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
National Legislation			
NEMA (Act No. 107 of 1998)	<p>The Environmental Assessment Regulations have been promulgated in terms of Chapter 5 of the Act. Listed activities which may not commence without an environmental authorisation are identified within these Regulations.</p> <p>In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation.</p> <p>In terms of GN R324, R325, and R327 of 4 December 2014, as amended, an Environmental Impact Assessment Process is required to be undertaken for the proposed project.</p>	National Department of Environmental Affairs (DEA)	<p>The Listed Activities triggered by the proposed Installation, operation and decommissioning of the RO Plant at the Matla Power Station have been identified and assessed within this BA process.</p> <p>A Final BA Report will be submitted to the competent authority, the DEA in support of an application for environmental authorisation.</p>
NEMA (Act No. 107 of 1998)	<p>In terms of the Duty of Care Provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with this project is avoided, stopped or minimised.</p> <p>In terms of NEMA, it has become the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts.</p>	National Department of Environmental Affairs (DEA)	No further licensing or permitting requirements are relevant. However, the principle of Duty of Care within the Act will be applicable throughout the project life cycle.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
<p>National Environmental Management Waste Act (Act No. 59 of 2008)</p>	<p>The Minister may by notice in the <i>Gazette</i> publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment.</p> <p>The Minister may amend the list by –</p> <ul style="list-style-type: none"> * Adding other waste management activities to the list. * Removing waste management activities from the list. * Making other changes to the particulars on the list. <p>In terms of the Regulations published in terms of this Act (GN 921), a basic assessment or full SEIR process is required to be undertaken for identified listed activities.</p> <p>Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that:</p> <ul style="list-style-type: none"> * The containers in which any waste is stored, are intact and not corroded or in * Any other way rendered unfit for the safe storage of waste. * Adequate measures are taken to prevent accidental spillage or leaking. * The waste cannot be blown away. * Nuisances such as odour, visual impacts and breeding of vectors do not arise; and * Pollution of the environment and harm to health are prevented 	<p>National Department of Environmental Affairs (DEA)</p>	<p>The project scope of the RO Plant does not include the construction of a waste disposal site. In addition, during the operation phase of the plant, it is anticipated that approximately 900m³ of <u>waste will be transported to and stored at the Ash Dam or at any licensed disposal facility.</u></p> <p>The EMPr (Appendix G) of the BA Report includes a condition for waste handling, storage and disposal during the construction, operation and decommissioning phase of the RO Plant, which the <u>applicant</u> (including sub-contractors) will be required to implement in accordance with the Act.</p> <p>Waste handling, storage and disposal during construction, and operation and decommissioning is required to be undertaken in accordance with the requirements of the Act, as detailed in the EMPr.</p>
<p>National Water Act (Act No. 36 of 1998)</p>	<p>A water use listed under Section 21 of the NWA must be licensed with the Regional DWS, unless it is listed in Schedule 1 of the NWA (i.e. is an existing lawful use), is</p>	<p>Regional Department of Water & Sanitation</p>	<p>The <u>project site</u> identified for the installation, operation and decommissioning of the RO Plant and associated infrastructure at the</p>

	<p>permissible under a GA, or if a responsible authority waives the need for a licence.</p> <p>Water use is defined broadly, and includes consumptive and non-consumptive water uses, taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation.</p> <p>Consumptive water uses may include taking water from a water resource (Section 21(a)) and storing water (Section 21(b)).</p> <p>Non-consumptive water uses may include impeding or diverting of flow in a water course (Section 21(c)), and altering of bed, banks or characteristics of a watercourse (Section 21(i)).</p>		<p>Matla Power Station is located within the regulated area of a wetland.</p> <p>The <u>applicant</u>, Eskom Holdings SOC Limited has an existing water use license (Appendix I) issued for activities listed under S21(b)(c)(f)(g) and (i). At the time of reporting, the <u>applicant</u> had commenced with and submitted an application to the <u>Department for a new WUL which will include a description of the activities associated with the installation and operation of the RO Plant.</u></p>
<p>National Heritage Resources Act (No. 25 of 1999) (NHRA)</p>	<p>Section 07 of the NHRA stipulates assessment criteria and categories of heritage resources according to their significance.</p> <p>Section 35 of the NHRA provides for the protection of all archaeological and palaeontological sites, and meteorites.</p> <p>Section 36 of the NHRA provides for the conservation and care of cemeteries and graves by SAHRA where this is not the responsibility of any other authority.</p> <p>Section 38 of the NHRA lists activities which require developers or any person who intends to undertake a listed activity to notify the responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the proposed development.</p>	<p>South African Heritage Resources Agency (SAHRA)</p> <p>Mpumalanga Heritage Resources Authority</p>	<p>A Heritage Impact Assessment Exemption Letter (Appendix D), including field work has been completed as part of the BA process. No sites of heritage significance were identified within the <u>affected property and project site</u> identified for the installation, operation and decommissioning of the RO Plant and associated infrastructure.</p> <p>A full Heritage Impact Assessment (HIA) (with field work) has been undertaken as part of the BA process (refer to Appendix H of this BA Report). No sites of heritage significance were identified within the development footprint.</p> <p>Should a heritage resource be impacted</p>

	<p>Section 44 of the NHRA requires the compilation of a Conservation Management Plan as well as a permit from SAHRA for the presentation of archaeological sites as part of tourism attraction.</p>		<p>upon, a permit may be required from SAHRA or Ngwao Boswa Kapa Bokone (NBKB) in accordance with of Section 48 of the NHRA, and the SAHRA Permit Regulations (GN R668). This will be determined as part of the final walk through survey once the final location of the development footprint and its associated infrastructure within the <u>project site</u> has been determined.</p>
<p><u>Emalahleni Air Quality Management By-Law, 2015</u></p>	<p><u>Section 16 of the Emalahleni Local Municipality Air Quality Management By-Laws provides that any person conducting activities which customarily produce emissions of dust that may be harmful to public health, well-being, and/or cause a nuisance shall take control measures to prevent or minimize emissions into the atmosphere.</u></p> <p><u>(2) Any person who undertakes any activity that causes dust emissions must implement one or more of the following control measures:</u></p> <ul style="list-style-type: none"> <u>(i) <u>Pave;</u></u> <u>(ii) <u>Use dust palliatives or suppressants;</u></u> <u>(iii) <u>Uniformly apply and maintain any surface gravel;</u></u> <u>(iv) <u>Erect physical barriers and signs to prohibit access to the disturbed areas;</u></u> <u>(v) <u>Use ground covers;</u></u> <u>(vi) <u>Re-vegetation which is similar to adjacent undisturbed native conditions; or</u></u> <u>(vii) <u>Any alternative control measure approved in writing by the air quality officer.</u></u> 	<p><u>Emalahleni Air Quality Management By-Law, 2015</u></p>	<p>The EMPr (Appendix G) of the BA Report includes a condition to address air quality impacts as a result of dust emissions due to <u>site clearance activities and the use of the existing gravel road network within the station's footprint during the project life cycle of the RO Plant. However, section 16 (4)(c) of the By-Laws does not apply to the proposed development as the gravel roads to be used during the project life cycle will have a daily traffic of less than 500 vehicles per day.</u></p>
<p><u>Emalahleni Local Municipality Solid Waste Management By-Laws</u></p>	<p><u>The Emalahleni Local Municipality Solid Waste Management By-Laws find application to the proposed development, which will generate general and hazardous waste during the project life cycle of the RO Plant.</u></p>	<p><u>Emalahleni Local Municipality Solid Waste Management By-Laws</u></p>	<p>The EMPr (Appendix G) provides a <u>condition for waste handling, storage and disposal during the project life cycle. The applicant is required to adhere to the provisions of this By-Law during the project</u></p>

<p><u>Emalahleni Local Municipality Noise Control By-Laws</u></p>	<p><u>The Emalahleni Local Municipality Noise Control By-Laws find application to the proposed development, through the following:</u></p> <p><u>3. Prohibition of Disturbing Noise</u></p> <p><u>A person may not –</u></p> <p>(a) <u>cause a disturbing noise; or</u> (b) <u>allow a disturbing noise to be caused by any person, animal, machine, device, apparatus, vehicle or model aircraft, or any combination thereof.</u></p> <p><u>4. Prohibition of Noise Nuisance</u></p> <p><u>No person may or without prior consent of the municipality -</u></p> <p><u>(i) use any power tool or power equipment for construction work, drilling work or demolition work, or allow it to be used in or near a residential area during the following hours:</u></p> <p><u>(i) before 06:00 and after 18:00 from Monday to Saturday; and</u> <u>(ii) before 08:00 and after 14:00 on a Sunday, if it causes a noise nuisance or noise disturbance.</u></p>	<p><u>Emalahleni Local Municipality Noise Control By-Laws</u></p>	<p><u>life cycle of the RO Plant.</u></p> <p><u>The project site for the development of the RO Plant is located 10km away from the town of Kriel, which is the nearest residential area within the vicinity of the project site. Furthermore, the construction activities during the 6-month period of the construction phase for the RO Plant, will be undertaken between 08h00 and 17h00. It is not anticipated that construction activities will be undertaken on weekends.</u></p> <p><u>During the project life cycle, it is not anticipated that noise levels will exceed 85dB.</u></p>
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CHAPTER 4: DESCRIPTION OF THE RECEIVING ENVIRONMENT

This chapter provides a description of the environment that surrounds the project site identified for the RO Plant. The information is provided in order to assist the reader in understanding the receiving environment within which the RO Plant is located, and features of the biophysical and social environment that could be directly or indirectly affected by the installation, operation and decommissioning of the plant. This information has been sourced from existing and available information as part of the BA process and aims to provide the context within which the process is being conducted.

4.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the BA Report includes the following information required in terms of the EIA Regulations, 2014 - Appendix 1: Content of Basic Assessment Reports:

Requirement	Relevant Section
3(h)(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	<p>The environmental attributes associated with the RO Plant and the broader environment are described and considered within this chapter and include the following:</p> <ul style="list-style-type: none"> » The regional setting within which Matla Power Station is located is described in section 4.2. » The climatic conditions of the area within which Matla Power Station is located is discussed in section 4.4. » The biophysical characteristics of the project site and the surrounding areas are described in sections 4.5 – 4.7. This includes the topography and terrain, geology, and the vegetation. » The heritage of the affected environment (including the archaeology, palaeontology and cultural landscape) is discussed in sections 4.8 – 4.9. » The social context within which the project site is located is described in section 4.10.

4.2 Regional Setting: Location of the RO Plant

The RO Plant development site is located ~60km south of eMalahleni, ~4km south – west of Kriel Power Station and 12km west of the town of Kriel in the Mpumalanga Province (**Figure 4.1**). The Mpumalanga Province is South Africa's 8th largest province and covers an area of approximately 76 49km², which is equivalent to ~6.5% of South Africa's total land area. The Province accommodates 4 039 939 million residents and is the 6th most populous province in the country. The province shares its borders with Mozambique and Swaziland. The RO Plant is located within the eMalahleni Local Municipality which is one of the six (6) municipalities within the greater Nkangala District Municipality (NDM). The NDM is situated within the western section of the Mpumalanga Province and is home to twelve (12) Eskom coal-fired power stations. The N4 national route links the province with Mozambique. The other national routes in the Province; N11 and N12 link Mpumalanga with the Gauteng, Limpopo, North West and the KwaZulu-Natal provinces.

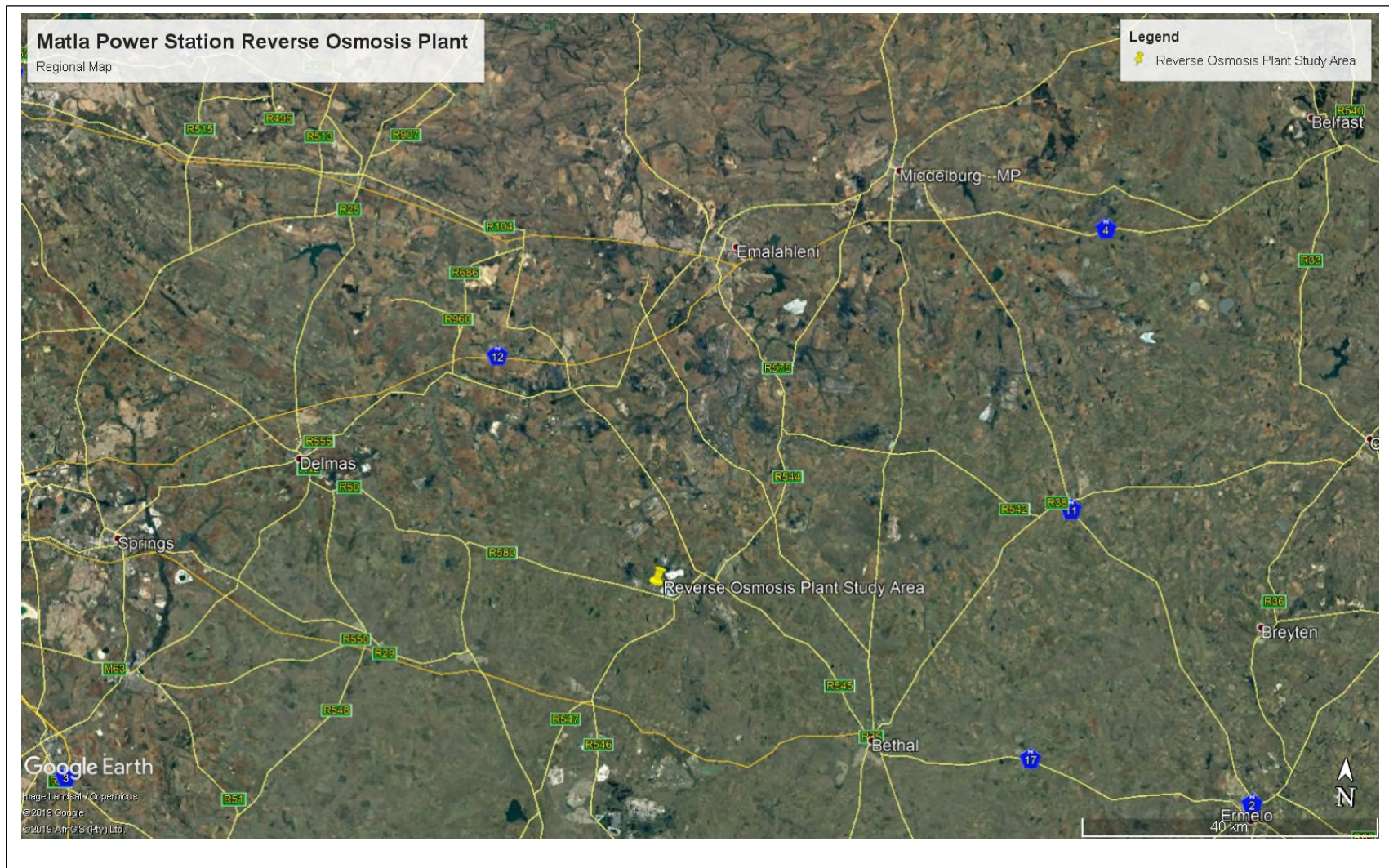


Figure 4.1: Regional context of the project site identified for the installation of the RO Plant at the Matla Power Station.

4.3 Existing land-use

The project site is located within the Matla Power Station boundary adjacent to the existing Ash Dam and the R580 provincial road. The site has been zoned for industrial use. The project site is located 5.6km south-east of the Exarro – Matla underground coal mine which currently supplies the Matla Power Station with coal.

4.4 Climatic Conditions

The project site identified for the installation of the RO Plant is located within the Highveld climate zone. This zone is characterised by summer rainfall with thunderstorms from October to March. The zone on average receives 601-700mm per annum of rainfall. The average temperatures are moderate (average of 24°C) with cold and frosty winter months. Prevailing northerly and easterly winds are dominant during summer months, while easterly winds occur in autumn and westerly winds during winter.

4.5 Topography & Hydrology

The project area is approximately 1600m above sea level on the Highveld plateau and is characterised by an undulating landscape with slopes less than 1:30. In addition, the site falls within the Olifants Catchment Area, with the Klein-Olifants, Olifants, Wilge, Rietspruit, Steenkoolspruit and Brugspruit being the main rivers in the area. Major dams in the region include the Rietspruit, Doringpoort and Witbank Dams (eMalahleni Local Municipality, 2009). Natural springs in the vicinity of the power station feed the seasonal Onverwacht, Pampoen, and Vaal Pan Spruits.

The springs drain to the east, north and west respectively. Furthermore, all surface water within the area drains in the Olifants River via the Riet and Steenkool Spruits. The Rietspruit flows to the north of the site into the Rietspruit Dam from where the water enters the Steenkoolspruit, which is located to the southeast of the power station. Both rivers are located within the B11E and B11D quaternary catchments (**Figure 4.2**) and are perennial. Both rivers have a Present Ecological Status (PES) of Class D: Largely Modified. These rivers are critically endangered due to the ecosystem process they maintain downstream.

Approximately seven (7) wetlands are located within the vicinity of the RO Plant project site and the Matla Power Station. Six (6) of these are natural wetlands and one (1) is artificial. The natural wetlands are largely depression, unchanneled valley-bottom and channelled valley-bottom wetlands in nature. The project site identified for the development of the RO Plant is located to a wetland system which extends from the north towards the existing Ash Dam footprint and drains into the Final Cut-off Dam and the Bakenlaagte stream. This wetland system is approximately 140m to the south of the project site of the RO Plant.

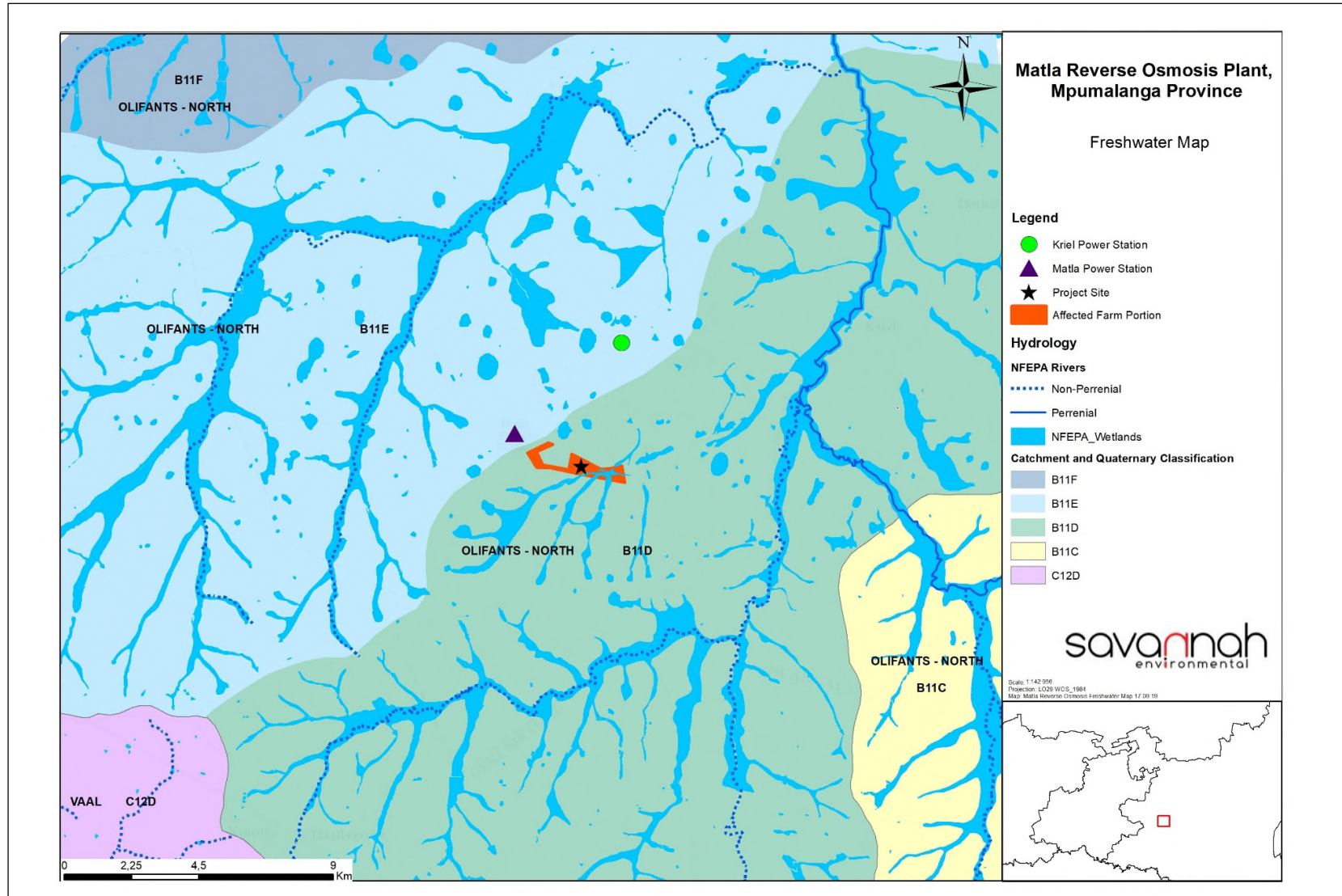


Figure 4.1: Freshwater resources and the respective quaternary catchment areas within the vicinity of the project site identified for the installation and operation of the RO Plant (refer to **Appendix H** for A3 Maps).

4.6 Geology

The RO Plant project site is located within the Karoo Basin that contains sediments deposited in fluvial floodplains and a shallow continental shelf over a period extending from the late Carboniferous Period (~290 million years ago) to the early Jurassic Period (~190 million years ago), before the separation of southern Africa and Gondwanaland. These sediments were deposited in fluvio-deltaic environments where swamps and marshes existed, and peat accumulated. Interlayered shales, mudstones, siltstones and sandstones constitute the bulk of the rock strata found in the area. Furthermore, dolerites, a prominent geological feature of the Karoo Basin, intruded after sedimentation in the basin had nearly ceased due to the intrusion of the Drakensburg basalts. These intrusive rocks intruded older successions of the Karoo Basin along planes of weaknesses. In the vicinity of Kriel, few dolerite intrusions are present which form sub-vertical dykes (J &W,2010).

Small fracture zones normally associated with the upper and lower contacts of sills (usually aquifers) also occur throughout the broader study area (Aurecon, 2010). The Karoo Basin has been subjected to several cycles of erosion, which resulted in weathering to great depths. Therefore, rocky outcrops are rare in this area and are often covered by transported soils. Weathering in the area is largely dependent on climatic conditions with disintegration occurring in the dry regions and decomposition in the wet regions (J&W, 2010).

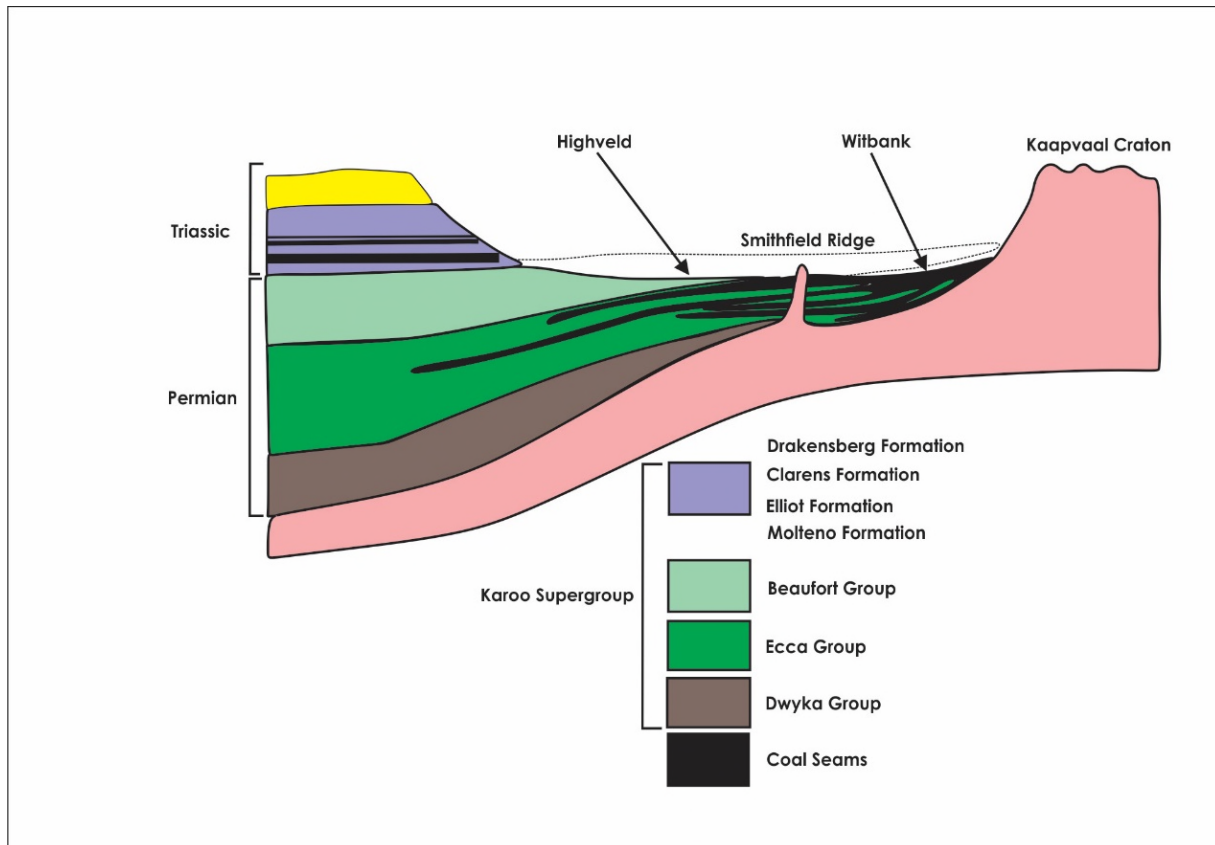


Figure 4.2: Schematic diagram illustrating the Witbank and Highveld coalfields separated by the Smithfield Ridge (adapted from Hancox, 2014).

4.7 Vegetation

The project site is located within the Mesic Highveld Grassland (MHG) Bioregion as defined by Mucina and Rutherford (2006). Within the vicinity of the power station, the dominant vegetation type found is the Eastern Highveld Grassland. Typically, this vegetation type occurs at a general altitude of 1 520 -1 780m, as well as 1 300m within the Mpumalanga and Gauteng Provinces. The affected property and the project site considered within this BA process is heavily modified due to anthropogenic disturbance at the station as a result of previous developments (i.e. construction of the Ash Dam and the Pump House, etc.). No indigenous vegetation remains within the project site.

4.8 Heritage Resources

The affected property identified for the development of the RO Plant is located within an industrial area – the Matla Power Station - and the presence of infrastructure such as an Ash Dam, the Final Cut-off Dam and the Pump House (refer to **Chapter 3**) has significantly transformed the area. No historic, Iron Age or Stone Age heritage site/artefacts were identified within the area.

4.9 Palaeontology

The footprint of the project site is underlain by rocks of the Vryheid Formation which are predominantly made up of coarse sandstones, conglomerates and coal seams. The depositional setting of the sediments that formed this suite of sedimentary rocks was possibly a sandy shoreline that stretched out to massive swamplands. In the swamps, there was an accumulation of organic material (i.e. plant debris) which under anaerobic conditions formed coal. No fossil finds have been recorded within the affected property and the project site identified for the development of the RO Plant and the associated infrastructure (**Appendix E**).

4.10 Social and Economic Characteristics of the Region

4.10.1 Demographics

The project site earmarked for the installation and operation of the RO Plant is located within the eMalahleni Local Municipality (ELM) which is one of the six (6) local municipalities within the greater Nkangala District Municipality (NDM). The ELM has an extent of ~ 2 678m² whilst the NDM is 16 892m² in extent. The two (2) municipalities have a population of 395 466 and 1 226 500 respectively. In addition, the NDM has the highest population density (35%) amongst the three (3) DMs in the Mpumalanga Province.

The ELM is distinguished from other LMs within the Province by a strong economically active population, representing more than half of the total population of the NDM. The local municipality has experienced population growth of ~3.6% between 2001 and 2011, which is higher than the national growth rate of 1.86% (Census, 2011). The dominant population groups within the ELM are, the black African population (81%), White (16%), Coloured and Indian (each covering less than 2%). The population age distribution reveals a young and economically active population (15 - 64) at 71%.

4.10.2 Education

Levels of education, like health are a good and reliable indication of the economic status and quality of life within an area. Data from the ELM regarding education has shown that, only 5.8% of its population that is above the age of 20 years, has not received any formal schooling. However, 38,4% of the municipality's residents have received primary education, whilst 5.9% completing this phase and another 32.7% receiving secondary education. Furthermore, only 2.5% of those that received secondary education completed matric (or passed Grade 12).

The eMalahleni Local Municipality Spatial Development Framework, 2015 refers to four (4) institutions of higher learning being located within the jurisdiction of the ELM. In order to reduce the high unemployment rate of the youth in the ELM, and increase literacy levels, the improvement of institutions of learning should be prioritised.

The project site and the power station are surrounded by agricultural land. No sensitive social receptors are present within the vicinity of the RO Plant and the power station and the nearest residential area, the town of Kriel, is located 10km away, which is a far greater distance for the project to have an impact on social receptors.

CHAPTER 5: ASSESSMENT OF IMPACTS

This Chapter serves to assess the significance of the positive and negative environmental impacts (direct, indirect and cumulative) expected to be associated with the installation, operation and decommissioning of the RO Plant at the Matla Power Station. This assessment has considered the RO Plant and associated infrastructure which will occupy an area of approximately 3 400m² within a project site that is approximately 1.66ha in extent.

5.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the BA Report includes the following information required in terms of Appendix 1: Content of the BA Report:

Requirement	Relevant Section
3(h)(v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts (aa) can be reversed, (bb) may cause irreplaceable loss of resources, and (cc) can be avoided, managed or mitigated.	The impacts and risks associated with the installation, operation and decommissioning of the RO Plant, including the nature, significance, consequence, extent, duration and probability of the impacts and the degree to which the impacts can be reversed and cause an irreplaceable loss of resources are included in section 5.3 and 5.4.
3(h)(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	The positive and negative impacts associated with the installation, operation and decommissioning of the RO Plant are included within section 5.3 and 5.4.
3(h)(viii) the possible mitigation measures that could be applied and the level of residual risk.	The possible mitigation measures that could be applied during the pre-construction, construction, operation and decommissioning phases of the RO Plant are included in section 5.3 and 5.4 as well as within the EMPr (refer to Appendix G).).
3(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures,.	A description of all environmental impacts identified for the pre-construction, construction, operation and decommissioning phases of the RO Plant and the extent to which the identified impact significance can be reduced through the implementation of the recommended mitigation measures provided by the EAP are included in 5.3 and 5.4.
3(j) an assessment of each identified potentially significant impact and risk, including (i) cumulative impacts, (ii) the nature, significance and consequences of the impact and risk, (iii) the extent and duration of the impact and risk, (iv) the probability of the impact and risk occurring, (v) the degree to which the impact and risk	An assessment of each impact associated with the installation, operation and decommissioning of the RO Plant, including the nature and significance, the extent, duration, probability, reversibility, potential loss of irreplaceable resources as well as the degree to which the significance of the impacts can be mitigated are

Requirement	Relevant Section
can be reversed, (vi) the degree to which the impact and risk may cause irreplaceable loss of resources and, (vii) the degree to which the impact and risk can be avoided, managed or mitigated.	included in section 5.3 and 5.4.
3(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr.	Mitigation measures recommended by the EAP and the specialist for the reduction of the impact significance are included in section 5.3 and 5.4 as well as within the EMPr (refer to Appendix G).

Potential environmental impacts associated with the installation and operation of the RO Plant are discussed in the sections which follow. It is noteworthy that the identified project site and the surrounding area (especially within the footprint of the Matla Power Station) is significantly transformed, therefore no additional independent specialist assessments (apart from heritage and palaeontology) were required or undertaken in this BA Report.

5.2 Assessment of Identified Impacts

5.2.1 Impacts on Surface Water

The development of the RO Plant at the Matla Power Station will have a positive impact on the station's water management strategy, as the proposed development will treat wastewater from the Final Cut-off Dam which will inevitably reduce the station's water consumption. The treated water from the RO Plant will be re-used within the station for industrial and domestic uses. This will reduce demand for abstraction from natural resources and therefore, this will free up and avail water resources to the environment and other water users in the area.

The project site identified for the RO Plant is located approximately 140m away from a National Freshwater Ecosystem Priority Area (NFEPA) Wetland. The development of the RO Plant could have a negative impact on this wetland as a result of surface water run-off transporting soil particles which could lead to siltation. This impact is anticipated to be of a low significance subject to the implementation of the recommended mitigation measures included in the EMPr (**Appendix G**). The proponent has obtained a Water Use Licence (WUL) (included in this BA Report as **Appendix E**) from the Department of Water and Sanitation for the power station and has made application to include the RO plant within this WUL.

Nature: *Impact on surface water*

The project site identified for the development and operation of the RO Plant is located approximately 140m north-west of a wetland. Therefore, there is a potential for silt and other similar-sized particles being transported downstream as a result of surface water run-off transport during the pre-construction and construction phase of the project due to the undertaking of site clearance activities.

	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Short-term (2)	Short-term (1)
Magnitude	Low (2)	Low (1)
Probability	Probable (3)	Improbable (2)
Significance	Low (15)	Low (6)
Status (positive or negative)	Negative	
Reversibility	Moderate	

Irreplaceable loss of resources?	Yes, if mitigation is not implemented
Can impacts be mitigated?	Yes
Mitigation:	
<ul style="list-style-type: none"> » The wetland and the associated riparian habitat must be avoided completely and be demarcated using a tape or similar markers. Workers, vehicles and machinery are prohibited from entering this area. » No soil stockpiles should be placed within or within 100m of the wetland or its riparian habitat. » Soil stockpiles must be adequately bunded to ensure the minimisation of sedimentation. » No fuels, oils or any other hazardous materials should be stored within 100m of the wetland. » The sulphuric acid offloading procedure should be followed strictly when offloading the acid to the storage tank. » Acid spillages should be neutralised immediately. » The acid bunded area should be kept empty and dry at all times. » It must be ensured that the MSDS of the acid is readily available and that the required PPE is used at all times when working with sulphuric acid. » The Contractor should ensure there are facilities to collect contaminated water in the area during the pre-construction and construction phase. » Temporary abluion facilities must not be placed within the wetland or within 100m from the wetland. The facilities must be checked regularly for maintenance purposes and be cleaned often in order to prevent spillages in the area. » The Contractor must ensure that no spillage occurs when effluent is being collected from the abluion facilities. » The discharge or temporary burial of effluent in the area is prohibited. » The acts of excretion and urination is prohibited other than within those facilities provided. » The Contractor must notify Matla Power Station immediately should any discharge of effluent or contaminated water occur on site. » Any incidents of pollution must be reported in accordance with the guidelines included in the EMPr and in accordance with the existing environmental incident management strategies at the station. 	
Cumulative Impacts	
None	
Residual Impacts	
Expected to be low if mitigation measures are correctly implemented.	

5.2.2 Impacts on Soil Resources

The installation of the RO Plant will require the undertaking of excavations into the sub-surface to allow for the siting of concrete support structures required for the placement of the RO Plant infrastructure and bund walls for the storage of hazardous substances. These activities, which will be associated with the pre-construction and construction phase of the proposed development, may have an impact on the soil resource within the project site. However, the impact is not anticipated to be of a high significance considering the nature of the project site (i.e. brownfields site), and the extent of the area (< 2ha) to be cleared for the installation of the RO Plant and associated infrastructure.

Taking the above into consideration, the installation, operation and decommissioning of the RO Plant at the Matla Power Station is therefore, supported from a soil's perspective, subject to the implementation of the recommended mitigation measures.

Nature: <u>Impact on soil resources</u>		
Excavations will be required for the concrete foundations and structures to support the RO Plant and associated infrastructure.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)

Duration	Short-term (2)	Short-term (1)
Magnitude	Low (2)	Low (2)
Probability	Definite (5)	Probable (2)
Significance	Low (25)	Low (8)
Status (positive or negative)	Negative	
Reversibility	Moderate	
Irreplaceable loss of resources?	Yes, if mitigation is not implemented	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » Excavations should be limited to as small an area as possible. » Appropriate erosion control measures must be implemented and maintained. » The Contractor and sub-contractors should rehabilitate areas that were disturbed during the construction phase of the RO Plant. » The existing gravel access road within the power station's precinct should be used to provide access to the project site during the construction phase. No new access roads may be developed. » Vehicles are to only make use of demarcated roads. » Only areas within the identified project site should be cleared. » The strict control over the movement of heavy machinery and equipment must be maintained. » Dust suppression should be undertaken on bare areas to mitigate against wind being an effective erosion agent during the construction phase. » Removed subsoil should be appropriately stored and used in rehabilitation activities. 		
Cumulative Impacts		
Due to the limited extent of the development, cumulative impacts are expected to be negligible.		
Residual Impacts		
Expected to be low if mitigation measures are correctly implemented.		

5.2.3. Intrusion impacts

Construction vehicles will make use of existing access roads to and within the station to access the project site for the RO Plant. Roads within the power station boundary are predominantly gravel in nature and could, therefore, lead to the generation of dust particles. In addition, excavations and other construction-related activities (i.e. trenching) during the construction phase will generate dust particles. Therefore, this section of the power station footprint under consideration for the BA process will experience a slight increase in traffic, as vehicles and machinery will be commuting to and from the area to deliver employees and other components required for the installation of the RO Plant during the construction phase. As the nearest residential area is approximately 10km from the site, there will be no impact on these areas.

Taking the above aspects into consideration and the short timeframe of the construction phase (i.e. 6 months), the significance of intrusion impacts particularly from dust generation and traffic will be of a low significance subject to the implementation of the recommended mitigation measures.

During the operation phase, the RO Plant is anticipated to generate noise which will not exceed 85dB. Employees working within the RO Plant containers will be provided with hearing protection during the operational phase of the project.

Taking the above into consideration, it is concluded that the significance of the intrusion impacts as a result of the proposed development will be low, subject to the implementation of the recommended mitigation measures included in the EMPr.

Nature: <i>Intrusion impacts</i>		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Short-term (2)	Short-term (2)
Magnitude	Low (2)	Low (2)
Probability	Definite (5)	Probable (1)
Significance	Low (25)	Low (5)
Status (positive or negative)	Neutral	
Reversibility	Reversible	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » The operation of machinery and the RO Plant must meet the noise standard requirements of the Occupational Health and Safety Act (Act No. 85 of 1993). » Workers and visitors in the area must be provided with noise protection equipment (i.e. earplugs etc.). » Machinery and equipment are to be switched off when not used. » Regular dust suppression, where possible of dusty areas must be undertaken by employing a water bowser or any other appropriate absorbent material. » Workers must be provided with dust protection equipment for the duration of the pre-construction and construction, operation and the decommissioning phase of the project. » Low emission emitting equipment should be used. » The Contractor must ensure that construction vehicles and machinery are maintained to keep emissions within acceptable limits. 		
Cumulative Impacts		
None.		
Residual Impacts		
None expected should mitigation measures be correctly implemented.		

5.2.4. Waste Generation

The pre-construction, construction, operation and decommissioning phase the RO Plant will include the generation of domestic and hazardous waste. Waste as a result of the treatment process of the water from the Final Cut-off Dam will be transported to the ash dam. This impact is anticipated to be of a low significance, subject to the recommended mitigation measures.

Nature: <i>Waste Generation</i>		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Short-term (2)	Short-term (2)
Magnitude	Low (2)	Low (2)
Probability	Definite (5)	Probable (3)
Significance	Low (25)	Low (15)
Status (positive or negative)	Negative	
Reversibility	High	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	

Mitigation:

- » Where possible, waste should be recycled during the construction, operation and decommissioning phases of the development.
- » General waste should be disposed of in the appropriate waste bin.
- » It must be ensured that the hazardous waste stored within the project site, must be stored in such a way that it does not become a nuisance.
- » The hazardous waste (apart from the waste from the treatment process which will be transported to the Ash Dam) generated during the life cycle of the RO Plant must be kept and stored on site until it is collected. The storage area must be scavenger proof.
- » The stored hazardous waste must only be stored for a period not exceeding three (3) months.
- » The hazardous waste must be disposed of in an acceptable receptacle.
- » For the transportation of the hazardous waste, the applicant must contract an accredited service provider (or the existing service provider appointed at the station tasked with the transport and disposal of hazardous waste) to collect and dispose such waste at a licensed hazardous waste disposal facility.
- » Records of all waste being taken off site must be kept as evidence during the duration of the project life cycle.
- » As with the hazardous waste, all solid and general waste must be disposed of at a registered and approved landfill site.
- » The Contractor should adhere to the provisions of the Matla Power Station Waste Management Plan, where possible, and if Matla Power Station permits, waste streams from the project site of the RO Plant should be disposed of along with that of the power station.
- » The Contractor should provide sufficient waste bins.
- » The dumping or burying of waste within the project site is prohibited.
- » The burning of vegetation, litter or refuse is also prohibited.
- » No dumping of waste material must be permitted in the surrounding open areas.
- » Bins must be emptied once a day when full and the waste must be transported to a registered landfill site.
- » It must be ensured during the project life cycle that all employees are made aware of the procedure to be followed in the event of a leak or spill. The procedure should include notifying the relevant personnel (i.e. Environmental Advisor or Officer) in the event of such an environmental incident.
- » It must be ensured that emergency spill kits and other necessary equipment required to contain spills are made available on site at all times.
- » In the event of any spill or leak, the source of the spillage must be isolated, and the spillage or leak be contained.
- » The spillage or leak area must be cordoned off and secured.
- » It must be ensured that there is always an adequate supply of absorbent material readily available to absorb/breakdown and encapsulate any spill or leak on site

Cumulative Impacts

None

Residual Impacts

Expected to be low if mitigation measures are correctly implemented.

5.2.5. Impact on the socio-economic environment

The development of the RO Plant will require the handling and storage of hazardous substances, particularly sulphuric acid and other chemicals which will be required during the reverse osmosis treatment process. Therefore, if these substances are not stored and handled correctly, they may pose a risk to the employees working within the area and the surrounding environment. The mitigation and management measures to reduce the impact adhere to the requirements included in the South African National Standards (SANS) regarding the warehousing of dangerous goods, and any legislation applicable to the storage and handling of the hazardous substances.

Nature: <i>Storage and Handling of dangerous chemicals and substances</i>		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Short-term (2)	Short-term (2)
Magnitude	Low (2)	Low (2)
Probability	Definite (5)	Probable (3)
Significance	Low (25)	Low (15)
Status (positive or negative)	Negative	
Reversibility	High	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » <u>Procedures detailed in the Material Safety Data Sheets (MSDS) must be followed in the event of an emergency situation.</u> » <u>The handling and storage of dangerous goods and chemicals must adhere to the conditions of the relevant legislations and the South African National (SANS) Standard Guideline.</u> » <u>The MSDS of each hazardous substance or good (including chemicals) must be kept on site at all times.</u> » <u>The Contractor (including sub-contractors) and Eskom Holdings SOC Limited must ensure that all deliveries of dangerous goods and chemicals to the site are supervised by suitably qualified personnel.</u> » <u>The Contractor (including sub-contractors) and Eskom Holdings SOC Limited must ensure that all dangerous goods and chemicals are carefully secured upon delivery.</u> » <u>The Contractor (including sub-contractors) and Eskom Holdings SOC Limited will be responsible for any clean-up resulting from the failure of any of their employees or suppliers to properly secure transported dangerous goods and chemicals.</u> 		
Cumulative Impacts		
None		
Residual Impacts		
Expected to be low if mitigation measures are correctly implemented.		

5.2.6. Impact on the socio-economic environment

The pre-construction (which will largely involve site-clearing) and construction phase of the RO Plant will be short-term. It is anticipated this phase of the project will not exceed six (6) months. Eskom has indicated that the project will be worth R39 000 000, and the total value will be spent in the Republic of South Africa and the Mpumalanga Province. Furthermore, Eskom has indicated that at least ~30 employees will be required for the construction of the proposed RO Plant. Although small, this could have a positive socio-economic impact on the local area.

Impacts on residential areas will be of a low significance to the social setting in the area considering that the project site identified for the development and operation of the RO Plant is located 10km away from the nearest residential area, Kriel. Furthermore, the project site is well located outside the vicinity of sensitive social receptors such as clinics, old age homes and schools in the area.

Nature: <i>Impacts on the socio-economic environment</i>		
	Without enhancement	With enhancement
Extent	Local (1)	Local (1)
Duration	Short-term (1)	Short-term (1)
Magnitude	Low (2)	Low (2)

Probability	Definite (5)	Improbable (2)
Significance	Low (20)	Low (8)
Status (positive or negative)	Positive	
Reversibility	N/A	
Irreplaceable loss of resources?	N/A	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » A local's first approach should be adopted for the procurement of a contractor and employees during the construction and decommissioning phase of the RO Plant. The Eskom procurement and tendering process must be followed when procuring a contractor. » The existing community structures must be used as a communication or liaison tool between Matla Power Station and members of the surrounding communities. » The Contractor (including sub-contractors) and Eskom Holdings SOC Limited must record complaints or queries from the public, as well as the corrective action taken. Records of all complaints must be kept on site during the life cycle of the project. » The Contractor and Eskom Holdings SOC Limited's contact details must be posted on as site board at a conspicuous location. » The Community Liaison Officer (CLO) must, where possible provide feedback to the public regarding the corrective actions implemented. 		
Cumulative Impacts		
None		
Residual Impacts		
Expected to be low due to the limited extent and duration of the project.		

5.2.7. Impact on heritage and palaeontological resources

No heritage resources of a high significance were identified within the study and project site of the RO Plant (refer to the Heritage Impact Assessment contained in **Appendix E**). Although the project site is associated with a high sensitivity in terms of palaeontology, the footprint of the RO Plant and the associated infrastructure will not exceed 2ha; also the foundations will be of a shallow depth, therefore, it is anticipated that the project will not pose any significant risk to fossils located in the sub-surface in the area. Should these be discovered during the construction phase of the development, the proponent is obligated to implement the Chance Find Protocol (included as **Appendix C** in the EMPr).

Nature: <i>Impact on heritage and palaeontological resources</i>		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	High (8)	Moderate (2)
Probability	Highly probable (4)	Improbable (2)
Significance	Medium (56)	Low (16)
Status (positive or negative)	Negative	Neutral
Reversibility	Irreversible	
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » The Contractor must take reasonable precautionary measures against any person from removing or damaging any fossil remains, or heritage articles of value or antiquity and structures of an archaeological significance which may be discovered within the project site. » Upon the discovery of a fossil, the Contractor must notify Matla Power Station in accordance with the provisions of 		

<p>the Fossils Chance Find Procedure included in the EMPr.</p> <ul style="list-style-type: none">» If a fossil chance find is made, the person responsible for the find must immediately stop working and all work must cease in the immediate vicinity of the find.» The person who made the find must immediately report the find to his/her Supervisor which in turn must report the find to his/her Manager and the Environmental Officer (EO) or Site Manager. The EO must report the find to SAHRA: Harrington Street, PO Box 4637 Cape Town 8000 Telephone: 021 462 4502 Fax: 021 462 4509» A preliminary report must be submitted to the relevant heritage agency within 24 hours of the find and must include:<ul style="list-style-type: none">* the date of the find* a description of the discovery* a description of the fossil and its context (depth and position of the fossil)* GPS coordinates» Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.» Upon receipt of the preliminary report, the Heritage Agency will inform the EO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.» The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sandbags. The Heritage agency will also be able to advise on the most suitable method of protection of the find.» If the fossil cannot be stabilized the fossil may be collected with extreme care by the EO (or site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.» Once Heritage Agency has issued the written authorization, the developer may continue with the development.» <u>If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich shell fragments, charcoal and ash concentrations) or other aggregates are found during the project life cycle of the RO Plant, the SAHRA APM Unit (Nokhukhanya Khumalo/Phillip Hine (021 202 8654)) must be alerted as soon as possible.</u>» <u>If unmarked human burial are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/Mimi Seetelo (021 320 8490)) must be alerted immediately.</u>
<p>Cumulative Impacts None</p>
<p>Residual Impacts Loss of fossil heritage</p>

5.2.8. Decommissioning Impacts

The RO Plant at the Matla Power Station is expected to have a lifespan of at least 3 years (with routine maintenance). The infrastructure would only be decommissioned, and the project site rehabilitated once it has reached the end its economic life. It is most likely that decommissioning activities of the infrastructure of the RO Plant considered in the BA process would comprise the disassembly of the plant's individual components. Therefore, site preparation activities will include confirming the integrity of the access to the site to accommodate required equipment, preparation of the site (e.g. bunded areas, foundations etc.) and the mobilisation of construction equipment required to undertake decommissioning activities. Disassembled components of the RO Plant and the associated infrastructure, where possible, will be re-used, recycle, or disposed of in accordance with the regulatory requirements of NEMA (Act No. 107 of 1998) and other relevant legislation.

Nature: Decommissioning Impacts		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Short-term (1)	Short-term (1)
Magnitude	Low (2)	Low (1)
Probability	Probable (3)	Improbable (2)
Significance	Low (12)	Low (6)
Status (positive or negative)	Negative	Positive
Reversibility	Reversible	
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » Activities preparing the site for decommissioning should only be undertaken within the footprint of the RO Plant and the associated infrastructure. » Removed sub-soil should be used as infilling material where trenches are created as a result of decommissioning activities, i.e. removal of foundations. » Components of the RO Plant and the associated infrastructure, where possible must be re-used or recycled. » Spill kits and other absorbent material required for containing spills and leakages must be made available on-site at all times during the decommissioning phase. » No new access roads should be constructed. Existing access roads within the footprint of the station should be used to access the site for the duration of the decommissioning phase. 		
Cumulative Impacts		
None		
Residual Impacts		
None		

5.3 Assessment of the 'Do Nothing' Alternative

The EIA Regulations, 2014 (as amended) require that within any BA Process, the 'Do Nothing' alternative for a proposed development be considered. The do-nothing' alternative (i.e. no-go alternative) is the option of not constructing the RO Plant and the associated infrastructure at the Matla Power Station. Should this alternative be selected, there would be no potential environmental impacts on the project site due to the installation, operation and decommissioning activities of the RO Plant. Therefore, the selection of the 'Do Nothing' alternative would mean the spillage risk presented by the Final Cut-off Dam to the surrounding environment remains. Furthermore, this also means that the water cannot be treated to a quality that is acceptable for use at the station. Therefore, the station would lose the opportunity to minimise the spillage risk and also improve its environmental integrity.

CHAPTER 6 CONCLUSIONS AND RECOMMENDATIONS

Eskom Holdings SOC Limited proposes the installation, operation and decommissioning of a RO Plant, as well as, associated infrastructure at the Matla Power Station near the town of Kriel in the Mpumalanga Province. A study area and project site has been identified within the existing footprint of the station which constitutes a section of Portion 4 of the Farm Bakenlaagte 84. The affected property and the project site falls within the eMalahleni Local Municipality and the greater Nkangala District Municipality.

A project site of 1.66ha has been identified within the affected property by the applicant for the development of the RO Plant and associated infrastructure, which has been fully considered within this BA process and assessed in terms of its suitability from an environmental perspective within this BA Report. The project site for the RO Plant is regarded as being technically suitable and sufficient in extent for the installation, operation and decommissioning of the RO Plant and associated infrastructure. Furthermore, no environmental sensitivities are associated with the identified project site.

The RO Plant will have a total treatment capacity of 4 380m³ per day. The plant will consist of two (2) RO modules, with a treatment capacity of 3130m³ and 1250m³. The RO Plant development will include specific infrastructure, namely:

- » Reverse Osmosis Modules;
- » Filtration Skids;
- » A Sulphuric Acid Tank;
- » A pipeline to connect the various components of the RO Plant to the Final Cut-off Dam;
- » Concrete support structures (including slab) for the RO Plant Infrastructure;
- » Chemical Stores;
- » Security Fencing; and
- » Electricity distribution boards.

A summary of the recommendations and conclusions for the proposed development as determined through the BA process are provided in this Chapter.

6.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the BA Report includes the following information required in terms of Appendix 1: Content of the BA Report:

Requirement	Relevant Section
3(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report	A summary of the findings of the BA process and the specialist studies undertaken for the RO Plant are included in section 6.2.
3(l) an environmental impact statement which contains (i) a summary of the key findings of the environmental	An environmental impact statement containing the key findings of the environmental impacts of the RO Plant has

Requirement	Relevant Section
impact assessment, (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	been included in section 6.4. No sensitive environmental features were identified within the RO Plant study area and development footprint. A summary of the positive and negative impacts associated with the development of the RO Plant and the associated infrastructure has been included in section 6.3.
3(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.	All conditions required to be included in the Environmental Authorisation for the RO Plant have been included in section 6.5.
3(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	A reasoned opinion as to whether the RO Plant at Matla Power Station should be authorised has been included in section 6.4.

6.2. Evaluation of the Matla Power Station Reverse Osmosis Plant

The preceding chapters of this BA Report together with the specialist study contained within **Appendix D – E** provide a detailed assessment of the potential impacts that may result from the development of the RO Plant. This chapter concludes the environmental assessment of the RO Plant by providing a summary of the results and conclusions of the assessment of the development footprint proposed for the RO Plant at the Matla Power Station. In doing so, it draws on information gathered as part of the BA process, the knowledge gained by the specialists and the EAP and presents a combined and informed opinion of environmental impacts associated with the development of the RO Plant.

No environmental flaws were identified in the specialist study undertaken⁸ and no impacts of an unacceptable significance are expected to occur with the implementation of the recommended mitigation measures. These measures include the total avoidance of the wetland and the associated riparian habitat, the prohibition for the placement of soil stockpiles within the wetland or its riparian habitat and the rehabilitation of the cleared areas upon the completion of the construction areas.

The potential environmental impacts associated with the development of the RO Plant at the Matla Power Station identified and assessed through the BA process include:

- » Impact on surface water
- » Impact on soil resources
- » Intrusion impacts
- » Waste Generation
- » Storage and Handling of hazardous substances
- » Impacts on the socio-economic environment
- » Impact on heritage & palaeontological resources
- » Decommissioning impacts

⁸ Only two specialist studies were undertaken for this development – a heritage impact assessment exemption letter and a palaeo-desktop study which are included as Appendix D and E of the BA Report.

Impact on surface water

The development of the RO Plant at the Matla Power Station will have a positive impact on the station's water management strategy, as the proposed development will treat wastewater from the Final Cut-off Dam which will inevitably reduce the station's water consumption. The treated water from the RO Plant will be re-used within the station for industrial and domestic uses. This will reduce demand for abstraction from natural resources and therefore, this will free up and avail water resources to the environment and other water users in the area.

The project site identified for the RO Plant is located approximately 140m away from a National Freshwater Ecosystem Priority Area (NFEPA) Wetland. The development of the RO Plant could have a negative impact on this wetland as a result of surface water run-off transporting soil particles which could lead to siltation. This impact is anticipated to be of a low significance subject to the implementation of the recommended mitigation measures included in the EMPr (**Appendix G**). The proponent has obtained a Water Use Licence (WUL) (included in this BA Report as **Appendix E**) from the Department of Water and Sanitation for the power station and has made application to include the RO plant within this WUL.

Impact on soil resources

The installation of the RO Plant will require the undertaking of excavations into the sub-surface to allow for the siting of concrete support structures required for the placement of the RO Plant infrastructure and bund walls for the storage of hazardous substances. These activities, which will be associated with the pre-construction and construction phase of the proposed development, may have an impact on the soil resource within the project site. However, the impact is not anticipated to be of a high significance considering the nature of the project site (i.e. brownfields site), and the extent of the area (< 2ha) to be cleared for the installation of the RO Plant and associated infrastructure.

Taking the above into consideration, the installation, operation and decommissioning of the RO Plant at the Matla Power Station is therefore, supported from a soil's perspective, subject to the implementation of the recommended mitigation measures.

Intrusion impacts

Construction vehicles will make use of existing access roads to and within the station to access the project site for the RO Plant. Roads within the power station boundary are predominantly gravel in nature and could, therefore, lead to the generation of dust particles. In addition, excavations and other construction-related activities (i.e. trenching) during the construction phase will generate dust particles. Therefore, this section of the power station footprint under consideration for the BA process will experience a slight increase in traffic, as vehicles and machinery will be commuting to and from the area to deliver employees and other components required for the installation of the RO Plant during the construction phase. As the nearest residential area is approximately 10km from the site, there will be no impact on these areas.

Taking the above aspects into consideration and the short timeframe of the construction phase (i.e. 6 months), the significance of intrusion impacts particularly from dust generation and traffic will be of a low significance subject to the implementation of the recommended mitigation measures.

During the operation phase, the RO Plant is anticipated to generate noise which will not exceed 85dB. Employees working within the RO Plant containers will be provided with hearing protection during the operational phase of the project.

Taking the above into consideration, it is concluded that the significance of the intrusion impacts as a result of the proposed development will be low, subject to the implementation of the recommended mitigation measures included in the EMPr.

Waste Generation

The pre-construction, construction, operation and decommissioning phase the RO Plant will include the generation of domestic and hazardous waste. Waste as a result of the treatment process of the water from the Final Cut-off Dam will be transported to the ash dam. This impact is anticipated to be of a low significance, subject to the recommended mitigation measures.

Storage and Handling of hazardous substances

The development of the RO Plant will require the handling and storage of hazardous substances, particularly sulphuric acid and other chemicals which will be required during the reverse osmosis treatment process. Therefore, if these substances are not stored and handled correctly, they may pose a risk to the employees working within the area and the surrounding environment. The mitigation and management measures to reduce the impact adhere to the requirements included in the South African National Standards (SANS) regarding the warehousing of dangerous goods, and any legislation applicable to the storage and handling of the hazardous substances.

Taking the above into consideration, it is concluded that the significance of the generation of waste impact as a result of the project life cycle of the RO Plant will be low, subject to the implementation of the recommended mitigation measures.

Impact on the socio-economic environment

The pre-construction (which will largely involve site-clearing) and construction phase of the RO Plant will be short-term. It is anticipated this phase of the project will not exceed six (6) months. Eskom has indicated that the project will be worth R39 000 000, and the total value will be spent in the Republic of South Africa and the Mpumalanga Province. Furthermore, Eskom has indicated that at least ~30 employees will be required for the construction of the proposed RO Plant. Although small, this could have a positive socio-economic impact on the local area.

Impacts on residential areas will be of a low significance to the social setting in the area considering that the project site identified for the development and operation of the RO Plant is located 10km away from the nearest residential area, Kriel. Furthermore, the project site is well located outside the vicinity of sensitive social receptors such as clinics, old age homes and schools in the area.

Impact on heritage and palaeontological resources

No heritage resources of a high significance were identified within the study and project site of the RO Plant (refer to the Heritage Impact Assessment contained in **Appendix E**). Although the project site is associated with a high sensitivity in terms of palaeontology, the footprint of the RO Plant and the associated infrastructure will not exceed 2ha; also the foundations will only be of a shallow depth; therefore, it is anticipated that the project will not pose any significant risk to fossils located in the sub-surface in the area. Should these be discovered during the construction phase of the development, the proponent is obligated to implement the Chance Find Protocol (included as **Appendix B** in the EMPr).

Decommissioning impacts

The RO Plant at the Matla Power Station is expected to have a lifespan of at least 3 years (with routine maintenance). The infrastructure would only be decommissioned, and the project site rehabilitated once it has reached the end its economic life. It is most likely that decommissioning activities of the infrastructure of the RO Plant considered in the BA process would comprise the disassembly of the plant's individual components. Therefore, site preparation activities will include confirming the integrity of the access to the site to accommodate required equipment, preparation of the site (e.g. bunded areas, foundations etc.) and the mobilisation of construction equipment required to undertake decommissioning activities. Disassembled components of the RO Plant and the associated infrastructure, where possible, will be re-used, recycle, or disposed of in accordance with the regulatory requirements of NEMA (Act No. 107 of 1998) and other relevant legislation.

6.3. Environmental Costs versus Benefits of the RO Plant

Environmental costs (including those to the natural environment and social environment) can be anticipated to a site-specific level and are considered acceptable provided the mitigation measures as outlined in the BA Report and the EMPr are implemented and adhered to. No fatal flaws have been identified or associated with the proposed development. These environmental costs include the following:

- » *Impacts on surface water* – The project site identified for the development of the RO Plant is located approximately 140m from the wetland identified in the area; therefore the construction phase of the RO Plant, as the area becomes cleared of vegetation, could lead to sediment transport which will have an impact on the ecological activities of the wetland. However, this impact will be of a low significance subject to the implementation of the mitigation measures.
- » *Intrusion impacts* - The construction phase of the RO Plant will be associated with an increase in traffic to this area of the station, which will also generate dust emissions since the internal gravel access roads to the project site are gravel in nature. However, this impact will be of a low significance subject to the implementation of the recommended mitigation measures and the short construction phase duration for the development.

Benefits of the RO Plant include the following:

- » The development and operation of the RO Plant will minimise bring the water level in the Final Cut-off Dam to safe operational levels, thereby the risk of an overflow into the existing wetland system downstream.

- » The operation of the RO Plant will reduce the need for raw make-up water for use in the cooling water system of the station, thus allowing the station to optimise its water management strategy and improve their environmental integrity status.
- » The use of the treated water from the plant in the cooling tower system would allow the proponent to reduce the supply pressure on the Usuthu and/or the Vaal Water Scheme from where raw make-up water for the station is currently sourced.

The benefits associated with the development and operation of the RO Plant are anticipated to occur at a national, regional and site-specific level. The possible costs to the environment by the project are largely offset by the benefits which include, the location of the project site within the existing footprint of the station, a disturbed area and the extent of the footprint required for the development of the RO Plant. Furthermore, the costs are also offset subject to the implementation of the recommended mitigation measures.

6.4 Implications for Project Implementation

With the implementation of mitigation measures, the significance of the impacts envisaged during the installation, operation and decommissioning phase of the RO Plant will be reduced to low. From the findings of the BA process, it is concluded that the installation, operation and decommissioning of the RO Plant is environmentally acceptable and should be authorised by the DEA. However, on-site mitigation is viewed as the most practical and appropriate action, and viable options for reducing the overall impact are detailed below:

- » The Contractor (including sub-contractors) and the proponent must adhere to the conditions of the environmental authorisation, the WUL and the EMPr which has been compiled as part of the BA process.
- » The Contractor (including sub-contractors) and the proponent must ensure that the requirements and conditions of the station's Waste Management, Health and Safety strategy during the life cycle of the project is implemented and adhered to.

6.5. Overall Conclusion (Impact Statement)

The installation, operation and decommissioning of the RO Plant with two (2) modules each with a treatment capacity of 3130m³ and 1250m³ located on a project site within the footprint of the Matla Power Station near the town of Kriel in the eMalahleni Local Municipality of the greater Nkangala District Municipality has been proposed by Eskom Holdings SOC Limited. The area is regarded as being technically suitable and sufficient in extent for the installation and operation of the RO Plant and was assessed as part of the BA process. The area was assessed by independent specialists and their findings have informed the result of the BA Report.

The specialist findings have indicated that there are no identified environmental flaws associated with the development of the RO Plant and the associated infrastructure within the project site. The footprint of the RO Plant is considered as the most appropriate and considered to be acceptable within the fields of the specialist studies undertaken for the project. In addition, the project site is associated with a low environmental sensitivity as the area is highly developed due to past and present anthropogenic disturbances (**Figure 6.1**). The acceptability of the development is based on the location of the project site within a highly disturbed area, which has also avoided sensitive environmental features like the

wetland. All impacts associated with the RO Plant can be mitigated through the implementation of the recommended mitigation measures.

Through the assessment of the development of the RO Plant and associated infrastructure within the study and project site, it can be concluded that the development of the Plant is environmentally acceptable subject to the implementation of the recommended mitigation measures.

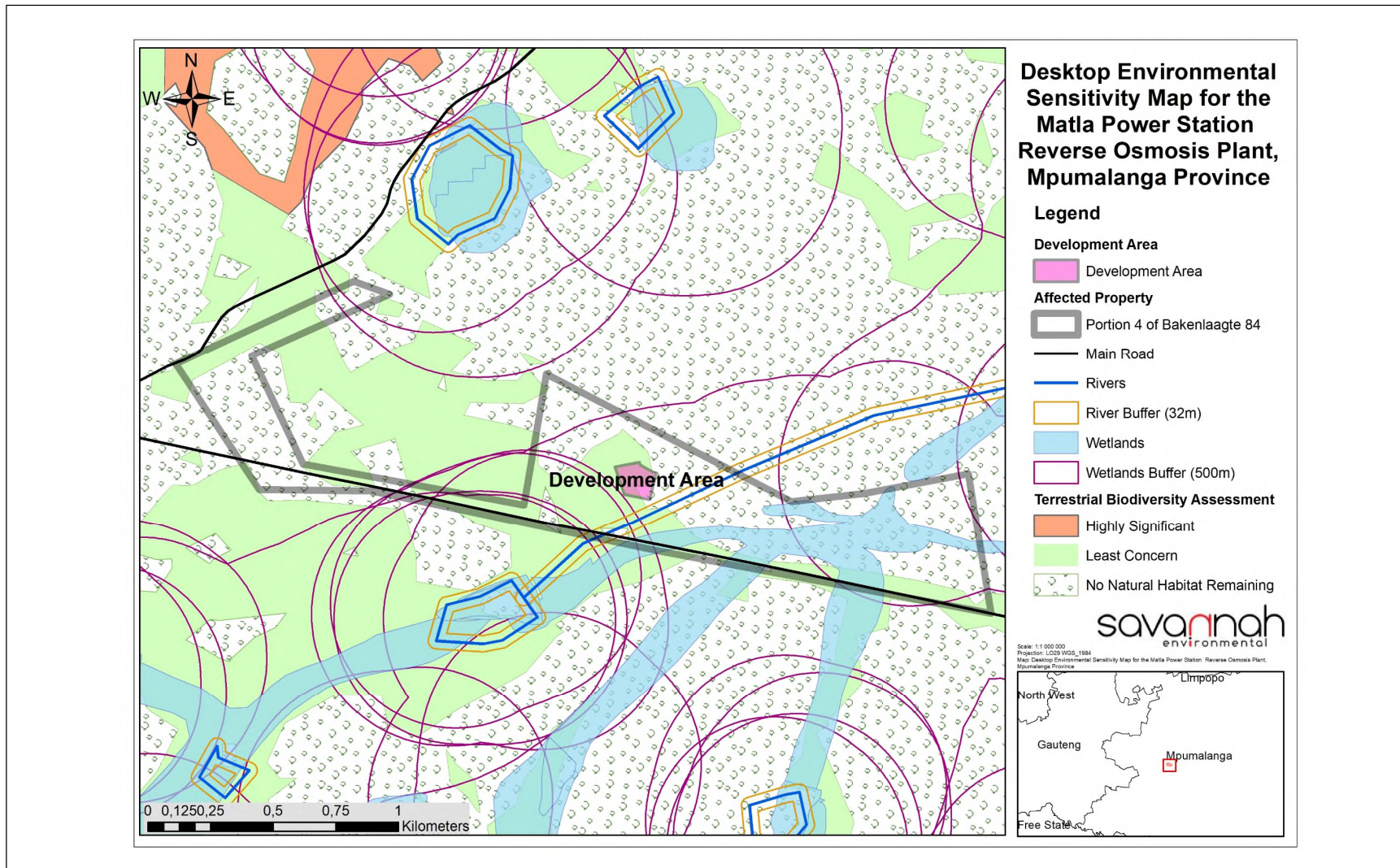


Figure 6.1: A desktop environmental sensitivity map showing the least concern area identified for the development of the RO Plant (refer to Appendix H for A3 maps).

6.5. Overall Recommendation

Based on the scale of the project, the duration of the life cycle of the project, the location of the study and project site within a brownfield's site, as well as the potential to minimise the identified impacts, it is the reasoned opinion of the EAP that the development of the RO Plant and associated infrastructure is acceptable within the landscape and can reasonably be authorised.

The following conditions should be included within the environmental authorisation issued for the project:

- » All mitigation measures detailed within this BA Report are to be implemented.
- » The EMPr contained as **Appendix G** of this BA Report should form part of the contract with the Contractor to be appointed for the construction, maintenance and decommissioning of the RO Plant in order to ensure the compliance with environmental specifications and management measures. The implementation of the EMPr for all life cycle phases of the RO Plant is considered key in achieving the appropriate environmental management standards as detailed for this project.
- » The project footprint must be kept as small as possible and a comprehensive rehabilitation plan must be implemented following the completion of the construction activities.
- » A Chance Find Protocol must be developed and implemented in the event that archaeological, palaeontological or burial remains are found within the development footprint. In the event where the activities of the RO Plant and associated infrastructure bring these materials to the surface, work must be cease and SAHRA or the local heritage authority must be contacted immediately.

CHAPTER 7 REFERENCES

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