ESKOM HOLDINGS SOC LIMITED

PROPOSED CONSTRUCTION OF RAW WATER AND MAKE-UP WATER PIPELINE AT MEDUPI POWER STATION

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

09 MAY 2019

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ESKOM HOLDINGS SOC LIMITED

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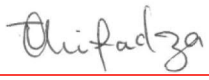
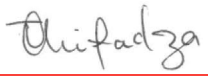
Signature				
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This Draft Environmental Management Programme Report (Report) for the Proposed Construction of a Make-up and Raw Water Supply Pipeline for the Flue Gas Desulphurisation Project at the Medupi Coal Fired Power Station was prepared by WSP Environmental Proprietary Limited (WSP) on behalf and at the request of the Eskom Holdings SOC Ltd (Client), as part of the application process for Environmental Authorisation.

Unless otherwise agreed by us in writing, we do not accept responsibility or legal liability to any person other than the Client for the contents of, or any omissions from, this Report.

To prepare this Report, we have reviewed only the documents and information provided to us by the Client or any third parties directed to provide information and documents to us by the Client. We have not reviewed any other documents in relation to this Report, except where otherwise indicated in the Report.

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GLOSSARY

ABBREVIATION	MEANING
BA	Basic Assessment
BAR	Basic Assessment Report
CBA	Critical Biodiversity Area
DEA	Department of Environmental Affairs
DEO	Designated Environmental Officer
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ERP	Emergency Response Plan
FGD	Flue Gas Desulphurisation
GA	General Authorisation
MCWAP-2	Mokolo Crocodile Water Augmentation Project – Phase 2
MSDS	Material Safety Data Sheets
MW	MegaWatt
NB	Nominal Bore
NEMA	National Environmental Management Act
NEM:WA	National Environmental Management: Waste Act
NHRA	National Heritage Resource Act
NKP	National Key Point

ABBREVIATION	MEANING
PCD	Pollution Control Dam
SAHRA	South African Heritage Resources Agency
SHE	Safety, Health and Environmental
SWMP	Stormwater Management Plan
TFR	Transnet Freight Rail
WML	Waste Management License
WMP	Waste Management Plan
WSP	WSP Environmental (Pty) Ltd
WUL	Water Use License

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1 INTRODUCTION

1.1 BACKGROUND

Eskom Holdings SOC Limited (Eskom) proposes to construct a make-up and raw water supply pipeline at the Medupi Coal Fired Power Station on farms Naauw Ontkomen 509 LQ, Portion 0 and Kuipersbult 511 LQ, Portion 0, in Lephalale, Ward 2, Lephalale Local Municipality, Limpopo.

The proposed pipeline requires an environmental authorisation (EA) in terms of the National Environmental Management Act (Act 107 of 1998), as amended (NEMA) and the associated Environmental Impact Assessment (EIA) Regulations, 2014 as amended. WSP Environmental (Pty) Ltd (WSP) was appointed by Eskom as the independent Environmental Assessment Practitioner (EAP) to facilitate the Basic Assessment (BA) process in accordance with the EIA Regulations, 2014, as amended.

Medupi Power Station is being constructed with installation of Flue Gas Desulphurisation (FGD) system, to manage sulphur dioxide (SO2) emissions, to each of the six 800 MegaWatt (MW) coal fired steam electric generating units. The FGD Project will result in the addition of wet limestone open spray tower FGD systems to each of the operating units. To support the FGD operation, substantial raw water is required, and this water will be supplied from the Mokolo Crocodile Water Augmentation Project – Phase 2 (MCWAP-2)[1]. The water will be provided through a project by the Department of Water and Sanitation (DWS), and Eskom was provided an offtake point for its Make-up water supply.

To deliver this additional water supply, Eskom Holdings SOC Limited (Eskom) proposes to construct a raw water supply pipeline of approximately 5 500 metres in length, in total, mostly within its premises at the Medupi Power Station.

The proposed pipeline will comprise two (2) segments:

- **Segment 1**: The first segment (raw water pipeline) will collect water from an offtake point of the MCWAP-2 pipeline on the north of the site. This pipeline will transfer water to Eskom's two holding reservoirs (Mokolo Water Reservoir or Crocodile West Water Reservoir). However, water will be taken primarily from the Crocodile West Water Reservoir.
- **Segment 2**: The second segment (FGD makeup water pipeline) of the pipeline water from the reservoirs and conveys it to the FGD Makeup Water Supply System. The function of the FGD Makeup Water Supply System will be to pre-treat and distribute makeup water from the holding reservoirs to the FGD Process Water Tanks and the Wastewater Treatment Plant. The existing raw water pump house has provision for a compartment for the FGD raw water pumps.

Figure 1-1 provides a locality map of the proposed project.

[1] Project is still in EA application phase with the DEA.

Figure 1-1: Medupi Power Station Locality Map

1.2 TERMS OF REFERENCE AND DETAILS OF THE EAP

WSP was appointed in the role of Independent EAP to undertake the BA processes for the proposed construction of the pipelines project. This Environmental Management Programme Report (EMPr) was drafted as part of the BA process and must be read in conjunction with the draft Basic Assessment Report (BAR) in support of the EA application. The CV of the EAP is available in **Appendix A**. The EAP declaration of interest and undertaking is included in **Appendix B**. **Table 1-1** details the relevant contact details of the EAP. In order to adequately identify and assess potential environmental impacts, the EAP was supported by a number of specialists. **Table 1-1** provides the relevant details of the project proponent.

Table 1-1: Details of the EAP

EAP	**WSP ENVIRONMENTAL (PTY) LTD**
Company Registration:	1995/08790/07
Contact Person:	Tutayi Chifadza
Postal Address:	P.O. Box 98867, Sloane Park 2151, Johannesburg
Telephone:	011 361 1390
Fax:	011 361 1301
Email:	Tutayi.Chifadza@wsp.com

1.3 ENVIRONMENTAL MANAGEMENT PROGRAMME STRUCTURE

Table 1-2 cross-references the sections within the EMPr with the legislated requirements as per Appendix 4 of GNR 326.

Table 1-2: Legislation Requirements as Detailed in Appendix 4 of GNR 326

APPENDIX 3	LEGISLATED REQUIREMENTS AS PER THE NEMA GNR 326	RELEVANT REPORT SECTION
(a)	Details of	
	i) the EAP who compiled the EMPr; and	Section 1.2 **Appendix A**
	ii) the expertise of the EAP, including a Curriculum Vitae	Section 1.2 **Appendix A**
(b)	Detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 3
(c)	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;	Section 3 **Appendix C**
(d)	A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-	
	i) Planning and design;	Section 3
	ii) Pre-construction activities;	Section 3
	iii) Construction activities	Section 3
	iv) Rehabilitation of the environment after construction and where applicable post closure; and	Section 7
	v) Where relevant, operation activities.	
(e)	A description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Section 7
(f)	A description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to -	
	i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	Section 7
	ii) Comply with any prescribed environmental management standards or practices;	
	iii) comply with any applicable provisions of the Act regarding closure, where applicable; and	
	iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable	

APPENDIX 3	LEGISLATED REQUIREMENTS AS PER THE NEMA GNR 326	RELEVANT REPORT SECTION
(g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 6
(h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 6
(i)	An indication of the persons who will be responsible for the implementation of the impact management actions;	Section 6 Section 7
(j)	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 7
(k)	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 6
(l)	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations	Section 6
(m)	An environmental awareness plan describing the manner in which-	
	i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and	Section 6
	ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment; and	
(n)	any specific information that may be required by the competent authority	N/A

1.4 APPLICABLE DOCUMENTATION

The following document is to be read in conjunction with the EMPr:

- Draft Basic Assessment Report (BAR) for the proposed construction of the raw water and make-up water pipeline.

2 GOVERNANCE FRAMEWORK

The South African regulatory framework establishes well-defined requirements and standards for environmental and social management of industrial and civil infrastructure developments. Environmental protection functions are carried out by different authorities at both national and regional levels. The applicable legislation and policies are shown in **Table 2-1** below.

Table 2-1: Applicable Legislation and Policies

APPLICABLE LEGISLATION AND POLICY	DESCRIPTION OF LEGISLATION
The Constitution of South Africa (No. 108 of 1996)	The Constitution cannot manage environmental resources as a stand-alone piece of legislation hence additional legislation has been promulgated in order to manage the various spheres of both the social and natural environment. Each promulgated Act and associated Regulations are designed to focus on various industries or components of the environment to ensure that the objectives of the Constitution are effectively implemented and upheld in an on-going basis throughout the country. In terms of Section 7, a positive obligation is placed on the State to give effect to the environmental rights.
National Environmental Management Act (No. 107 of 1998)	In terms of Section 24(2) of the NEMA, the Minister may identify activities which may not commence without prior authorisation. The Minister thus published GNR 327 (Listing Notice 1), 325 (Listing Notice 2) and 324 (Listing Notice 3) listing activities that may not commence prior to authorisation (7 April 2017). The regulations outlining the procedures required for authorisation are published in GNR 326 [Environmental Impact Assessment Regulations (EIA)] (7 April 2017). Listing Notice 1 identifies activities that require a Basic Assessment (BA) process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 2 identifies activities that require an S&EIR process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 3 identifies activities within specific areas that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. WSP undertook a review of the listed activities according to the proposed project description to conclude that **Listed Activities 9, 12 and 19 of GNR 327** are considered applicable and therefore a BA process must be followed. An EA is required and will be applied for.

APPLICABLE LEGISLATION AND POLICY	DESCRIPTION OF LEGISLATION
Listing Notice 1: GNR 327	***Activity 9 –*** *The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water—* *(i) with an internal diameter of 0,36 metres or more; or* *(ii) with a peak throughput of 120 litres per second or more* **Description:** Construction of two pipeline segments totalling approximately 5 500 metres for bulk transportation of raw water to the FGD system. Please note that the design stage identified a 0.9 metre internal diameter pipeline that triggers this activity. ***Activity 12 –*** *The development of:* *(ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs—* *(a) within a watercourse.* **Description:** The proposed construction of a raw water pipeline is an underground pipeline is within 500m of wetlands. The proposed pipeline segments will exceed the 100 square metre threshold footprint. ***Activity 19 –*** *The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse.* **Description:** The proposed raw water pipeline comprises an underground and on-surface sections of the pipeline. As such, for the underground sections, dredging, excavation and removal of soil of more than 10 cubic metres will be conducted so as to bury the pipeline underground. Infilling of the area will be done using the same material as backfill after the pipeline has been installed in order to cover it up. The proposed area is within 500 metres of a wetland, hence within a watercourse. ***Activity 27*** *– The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for–* *(i) the undertaking of a linear activity; or* *(ii) maintenance purposes undertaken in accordance with a maintenance management plan.* **Description:** Eskom will require a 32m corridor for potential area to lay the pipeline, but will only clear 8m for majority of pipeline and 12m where the pipelines run together (from reservoir pump house until after road and rail crossing). The proposed pipeline servitude will require clearance of at least 1 hectare but less than 20 hectares.

APPLICABLE LEGISLATION AND POLICY	DESCRIPTION OF LEGISLATION
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM:WA) is subsidiary and supporting legislation to the NEMA. The Act is a framework legislation that provides the basis for the regulation of waste management. The Act also contains policy elements and gives a mandate for further regulations to be promulgated. On 29 November 2013 GNR 921 was promulgated (repealing GN R718) which contains a list of waste management activities that if triggered require a Waste Management License (WML) and in turn a Basic Assessment (Category A activities) or Scoping and EIA (Category B activities) process to be undertaken in terms of the NEMA EIA Regulations. Category C activities are required to comply with the Norms and Standards for Storage of Waste 2013 (GN. 926) and do not require authorisation. It is anticipated that activities on the site will not trigger the NEM:WA. However, waste handling, storage and disposal during the construction and operational phase of the project must be undertaken in accordance with the requirements of this Act and the Best Practicable Environmental Option which will be incorporated into the site specific Environmental Management Programme (EMPr).
National Water Act, 1998 (Act No. 36 of 1998)	The National Water Act, 1998 (Act No. 36 of 1998) (NWA) provides the framework to protect water resources against over exploitation and to ensure that there is water for social and economic development, human needs and to meet the needs of the aquatic environment. The Act defines water source to include watercourses, surface water, estuary or aquifer. A watercourse is defined in the Act as a river or spring, a natural channel in which water flows regularly or intermittently, a wetland, lake or dam into which or from which water flows, and any collection of water which the Minister may declare a watercourse. Section 21 of the Act outlines a number of categories which require a water user to apply for a Water Use License (WUL) and Section 22 requires water users to apply for a General Authorisation (GA) with the Department of Water and Sanitation (DWS) if they are under certain thresholds or meet certain criteria. The list of water uses applicable that require a GA under Section 21 are presented below: c) Impeding or diverting the flow of water in a watercourse; and i) Altering the bed, banks, course or characteristics of a watercourse; It is anticipated that a GA will be required for the impeding or diverting of the flow of water in a watercourse and the altering of bed, banks, course or characteristics of a watercourse under Section 21(c) and (i) respectively as a result of the wetland systems present on the site.
National Heritage Resource Act (Act No. 25 of 1999)	The National Heritage Resource Act (Act No. 25 of 1999) (NHRA) serves to protect national and provincial heritage resources across South Africa. The NHRA provides for the protection of all archaeological and palaeontological sites, the conservation and care of cemeteries and graves by the South African Heritage Resource Agency (SAHRA), and lists activities which require any person who intends to undertake to notify the responsible heritage resources agency and furnish details regarding the location, nature, and extent of the proposed development. In terms of the Section 38 of NHRA, any person who intends to undertake a linear development exceeding 300m in length or a development that exceeds 5000m^2 must notify the heritage resources authority and undertake the necessary assessment requested by that authority. In the case of the proposed construction of a raw water pipeline, a Heritage exemption will be applied for to SAHRA as comprehensive studies have already been conducted on the site and the letter is attached as **Appendix F-1**. Construction activities should be conducted carefully and all activities ceased if any archaeological, cultural and heritage resources are discovered. The SAHRA should be notified and investigation conducted before any activities can commence.

3 PROJECT DESCRIPTION

3.1 LOCATION OF THE PROPOSED PROJECT

The proposed construction of a make-up water and raw water pipeline is to be located at the Medupi Coal Fired Power Station on farms Naauw Ontkomen 509 LQ, Portion 0 and Kuipersbult 511 LQ, Portion 0, in Lephalale, Ward 2, Lephalale Local Municipality, Limpopo Province (23°42'17.75"S, 27°34'3.02"E). The proposed pipeline segments are approximately 2 500 (raw water pipeline) metres and 3 000 metres (make-up water pipeline).

Figure 3-1 below shows the proposed pipeline alignment (i.e. preferred pipeline route) indicated in red (segment 1) from an offtake point (which was provided by the DWS) and in yellow (segment 2) from the pump transfer house from the reservoirs to the FGD plant. The proposed pipeline segments will be within the Medupi Power Station site boundary (preferred route.

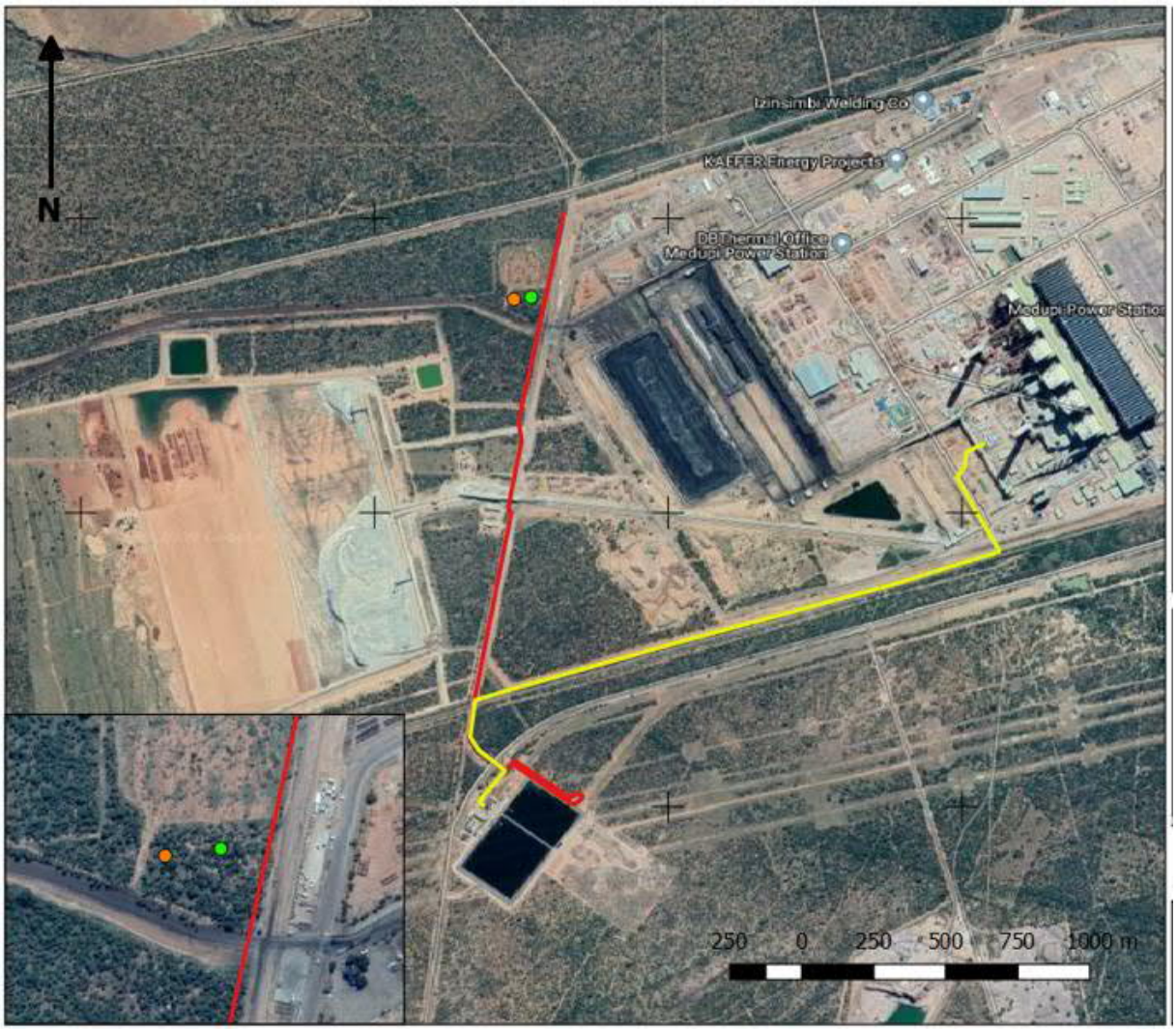

Figure 3-1: Preferred Pipeline Route Layout Map

The proposed pipeline segments will run through the land parcel outlined in **Table 3-1** within the confines of the site boundary.

Table 3-1: Cadastral Information of the site

DETAILS REQUIRED AS PER GN.R 326 ANNEX 1 (3)	DETAIL
21 Digit Surveyor General Code of each Cadastral Land Parcel	– T0LQ00000000050900000 – T0LQ00000000051100000
Physical Address and Farm Name	– Naauw Ontkomen 509 LQ, Portion 0; and – Kuipersbult 511 LQ, Portion 0,
Land Use Zoning	Industrial

The reference map for the raw water pipeline segment is illustrated in **Figure 3-2** below.

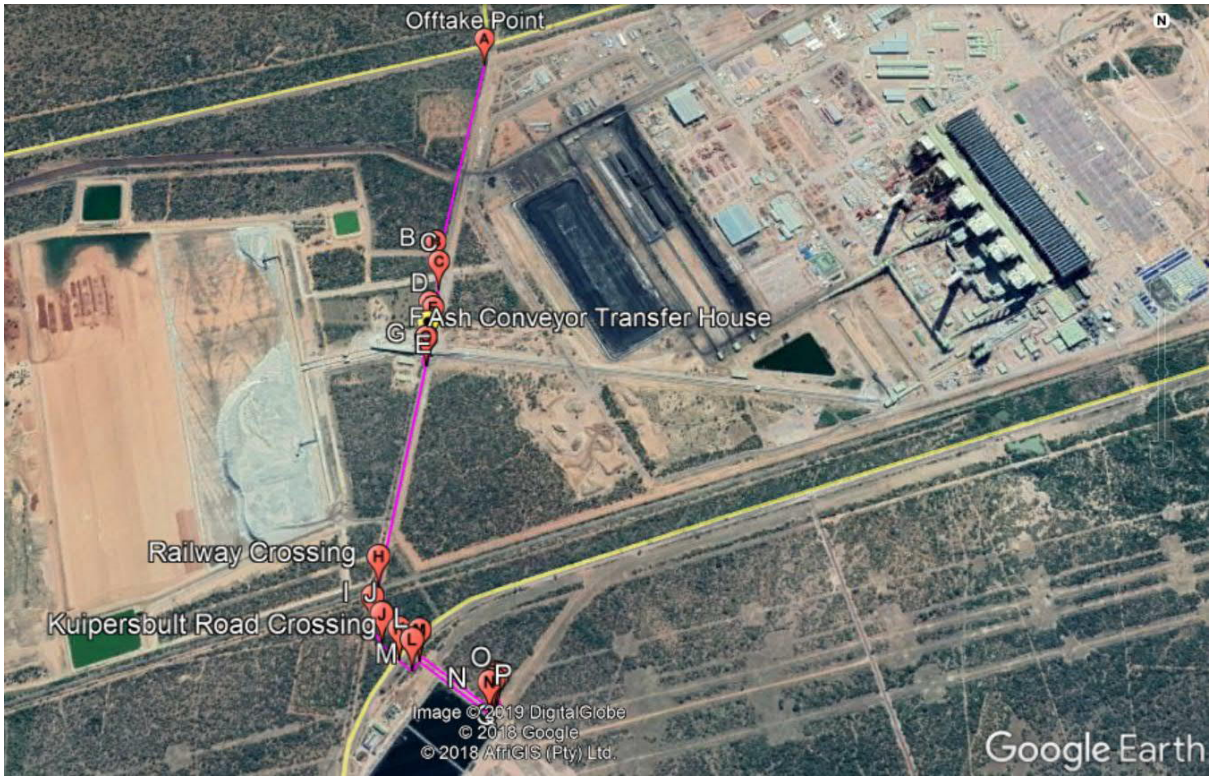

Figure 3-2: Raw Water Pipeline Segment Coordinates

The coordinates of the preferred proposed raw water pipeline segment from the off-take point are shown in **Table** 3-2**.**

Table 3-2: Coordinates of the Raw Water Pipeline Segment

POINTS	LATITUDE	LONGITUDE
A	23°41'59.33"S	27°32'47.29"E
B	23°42'24.86"S	27°32'41.73"E
C	23°42'27.23"S	27°32'42.13"E
D	23°42'31.98"S	27°32'41.16"E
E	23°42'32.58"S	27°32'41.59"E
F	23°42'35.91"S	27°32'40.94"E
G	23°42'35.96"S	27°32'40.84"E

POINTS	LATITUDE	LONGITUDE
H	23°42'59.46"S	27°32'36.24"E
I	23°43'3.48"S	27°32'35.74"E
J	23°43'5.16"S	27°32'36.81"E
K	23°43'6.63"S	27°32'38.75"E
L	23°43'7.69"S	27°32'40.15"E
M	23°43'6.78"S	27°32'40.92"E
N	23°43'11.80"S	27°32'48.48"E
O	23°43'11.47"S	27°32'48.77"E
P	23°43'11.53"S	27°32'48.91"E
Q	23°43'11.08"S	27°32'49.30"E
R	23°43'10.96"S	27°32'49.10"E

The reference map for the make-up water pipeline segment is illustrated in **Figure 3-3** below.

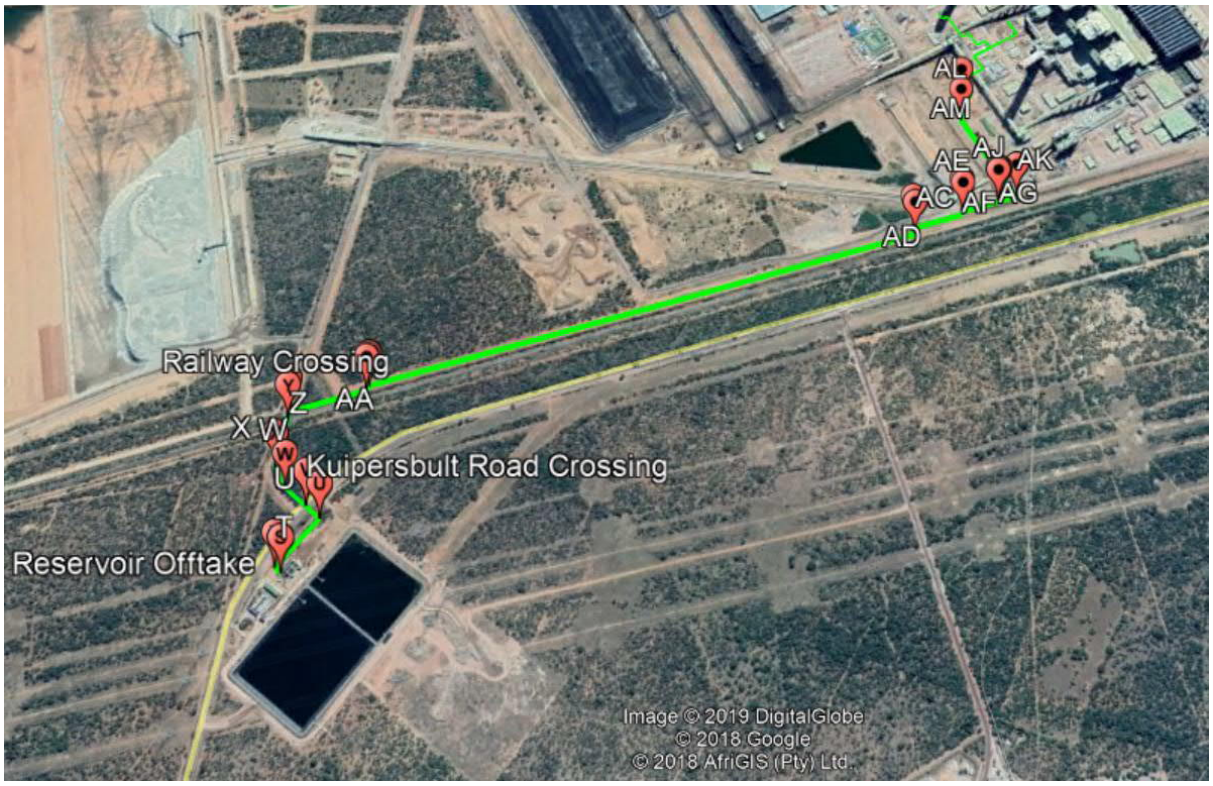

Figure 3-3: Make-Up Water Pipeline Segment Coordinates

The coordinates of the preferred proposed make-up water pipeline segment from the holding dams are shown in and **Table 3-3** respectively.

Table 3-3: Coordinates of the Make-Up Water Pipeline Segment

POINTS	LATITUDE	LONGITUDE
S	23°43'11.81"S	27°32'37.39"E
T	23°43'11.42"S	27°32'36.83"E

POINTS	LATITUDE	LONGITUDE
U	23°43'7.57"S	27°32'40.08"E
V	23°43'6.56"S	27°32'38.80"E
W	23°43'5.11"S	27°32'36.86"E
X	23°43'3.46"S	27°32'35.80"E
Y	23°42'59.43"S	27°32'36.32"E
Z	23°42'58.90"S	27°32'36.38"E
AA	23°42'57.05"S	27°32'42.80"E
AB	23°42'56.70"S	27°32'43.01"E
AC	23°42'42.93"S	27°33'31.13"E
AD	23°42'42.38"S	27°33'30.95"E
AE	23°42'41.07"S	27°33'35.59"E
AF	23°42'40.78"S	27°33'35.50"E
AG	23°42'39.85"S	27°33'38.92"E
AH	23°42'39.67"S	27°33'38.87"E
AI	23°42'39.63"S	27°33'39.02"E
AJ	23°42'39.80"S	27°33'39.08"E
AK	23°42'39.35"S	27°33'40.62"E
AL	23°42'31.97"S	27°33'35.96"E
AM	23°42'29.97"S	27°33'36.10"E
AN	23°42'29.45"S	27°33'37.07"E

3.2 LAYOUT AND DESCRIPTION

3.2.1 CONSTRUCTION ACTIVITIES

The proposed pipeline route will begin at the MCWAP-2 pipeline offtake point, which is to the north of the site. The pipeline will be buried underground from just beyond the offtake point until it reaches the ash conveyor transfer house, where it will move aboveground in order to protect the integrity of this transfer house. After passing through the ash conveyor transfer house, the pipeline will be buried underground again, crossing under the railway line and the Kuipersbult Road until it reaches the raw water dams' boundary fence where it moves aboveground and crosses the new pipeline going to the FGD system and crossing the existing raw water lines to the power station. It then goes below ground to the raw water dam valve station where it connects to the existing terminal point. Eskom's raw water holding dams are made up of two compartments, the Mokolo Water Reservoir and the Crocodile West Water Reservoir. Water for the FGD system will be taken primarily from the Crocodile compartment of the raw water holding reservoir. The corridor with the pipeline route from the MCWAP-2 offtake point to the reservoirs is already impacted as a result of existing operations within the Medupi site, including truck movements for ash disposal as well as a storage yard, however, some vegetation clearance (shrubs, trees and grass) will be required within the pipeline servitude, but will be done to a scale of less than a hectare. There will be no requirement for the construction of access roads as existing access roads

within the Medupi site will be used. The pipeline will be buried deeper at railway and road crossings in order to protect the integrity of this infrastructure. There will also be reinforcement structures under the rail and road crossings. No routing alternatives were considered for this pipeline segment as it is the only feasible route from the offtake point. However, the assessment will be undertaken for a corridor as wide as 32m, which is an available corridor that is bordered by existing station activities. Eskom will require a 32m corridor for potential area to lay the pipeline, but will only clear 8m for majority of pipeline and 12m where the pipelines run together (from reservoir pump house until after road and rail crossing).

After raw water is deposited into the reservoirs, the second pipeline segment will be required in order to transfer water to the FGD system. This pipeline starts from the pump house at the reservoirs with a 32m corridor, and will mainly collect water from the Crocodile compartment as mentioned before (although water can also be conveyed from the Mokolo compartment as part of the design contingency for maintenance and emergency purposes). The pipeline exits the pump house and runs underground on the north side of the existing pipeline. The line turns east of the gravel road on the west of the site boundary and passes under the Kuipersbult Road at the same point as the other pipeline. The line passes under the railway line and turns east at the station boundary, and runs outside the station boundary for 250m where it enters the rail yard fence. The line runs east alongside the rail yard fence between the existing power station National Key Point (NKP) fences. The two inner fences will be relocated to the north of the rail yard. At the eastern end of the rail yard, the pipeline will turn north and then east within the NKP fence. At this point, the pipeline will move above ground. The pipeline will then turn to the north on the east side of Road 3 (Ring Road West). Finally, it will turn into the FGD Raw Water Pre-treatment Plant at the Gypsum Sales Loading Facility.

During construction, all the topsoil and subsoil removed and will be stored along the pipeline servitude at a safe distance to prevent unwanted backfilling of the pipeline path before works are conducted. The soil will then be used as backfill after the pipeline is laid in the same order in which it was removed.

The pipeline runs within the rail yard and power station perimeter fences for the majority of the routing in an area that is not constrained with existing servitudes.

3.2.2 OPERATIONAL ACTIVITIES

The operational phase will commence once the FGD systems are ready to be implemented. Pipeline will be operated to transfer water and any other works are only needed when maintenance activities are done on the site.

3.2.3 DECOMMISSIONING ACTIVITIES

Decommissioning will be considered as part of the decommissioning of the broader facility which will be subject to a separate authorisation and impact assessment process.

3.2.4 ACCESSIBILITY

Medupi Power Station is directly accessible from a regional road mainly used by site personnel. No new access roads will be required for the project as the proposed pipeline servitude is close to existing access roads within the Medupi Power Station site boundary.

3.2.5 WATER DEMAND, SUPPLY AND STORAGE

During construction, the site personnel will have a contractor laydown area close to the proposed pipeline route. Water for use on the project (contractor's use) will be supplied from the Medupi Power Station and will be stored on the site camp.

3.2.6 ELECTRICITY DEMAND AND SUPPLY

The site camp will mainly be constituted of storage containers for materials, ablution facilities and the site office. Power to the site office will be from the contractor's diesel powered generator.

3.2.7 WASTE MANAGEMENT

Waste Management at the project site will be undertaken in line with the EMPr to consider the correct disposal of general and hazardous waste generated on the site. **Table 3-4** describes the different waste products that the proposed project will produce, as well as the various options to dispose of them. Waste will mainly be generated during both construction activities when contractors spend considerable amount of time on the site. During operation, contractors are only on the site for limited amount of time as and when maintenance is required.

Table 3-4: Waste Management Options

WASTE	TYPE OF WASTE	MANAGEMENT OPTIONS
Hydrocarbons (Contaminated soil)	Hazardous	Fuel and oil spillages can be a source of contamination of water sources and the soil. Management options include: – Using spill kits to clean any spillages; – Ensure storage facilities are maintained and meet industry regulations; – Transportation and storage of fuel must be regulated and correctly managed according to the EMPr; and – All hazardous waste is to be disposed of at a registered hazardous landfill (safe disposal certificates must be obtained).
Contaminated PPE	Hazardous	PPE can be contaminated during handling of hydrocarbons. Management options include: – Store contaminated PPE in hazardous waste skips; – Ensure contaminated PPE is disposed of at a registered hazardous landfill (safe disposal certificates must be obtained).
Office waste	General	Office waste (inorganic matter) can be disposed of as per normal and form part of the municipal waste management system. – Ensure waste is stored securely in refuse bins or selected areas; – Co-ordinate waste removal with the general removal of waste from the Medupi Power Station
Food waste	General	Food waste is generated as site personnel take their meals on the site camp. Management options include: – Store any waste and packaging into a labelled food waste bin; and – Co-ordinate waste removal with the general removal of waste from the Medupi Power Station.

3.3 NEEDS AND DESIRABILITY OF THE PROJECT

The Needs and Desirability Guidelines highlights the need to consider how the geographical, physical, biological, social, economic and cultural species of the environment that may be affected by the proposed activity. The proposed project is a sub-project supporting the proposed FGD system whose ultimate goal is to minimise SO2 emissions. As such, the assessment was done at the higher project level and the needs and desirability of the proposed raw water and make-up water supply pipeline project is reduced to ensure water is supplied to the FGD system. The proposed construction of a raw water pipeline is needed so as to provide additional raw water to support the FGD operation.

4 IMPACT ASSESSMENT

A summary of the identified impacts and corresponding (initial and residual) significance ratings for the proposed development is provided in **Table 4-1** below.

Table 4-1: Impact Summary

NO.	IMPACT DESCRIPTION	PHASE	WITHOUT MITIGATION		WITH MITIGATION	
			SIGNIFICANCE	STATUS	SIGNIFICANCE	STATUS
C1	Generation of Dust and PM	Construction	Medium	(-)	Low	(-)
C2	Noise	Construction	Low	(-)	Low	(-)
C3	Soil Erosion	Construction	Medium	(-)	Low	(-)
C4	Soil Contamination	Construction	Medium	(-)	Low	(-)
C5	Change of Flow Volumes and Drainage Patterns (Surface Water)	Construction	Medium	(-)	Low	(-)
C6	Deterioration in Water Quality (Surface Water)	Construction	Medium	(-)	Low	(-)
C7	Change of Flow Volumes and Drainage Patterns (Groundwater)	Construction	Medium	(-)	Low	(-)
C8	Deterioration in Water Quality (Groundwater)	Construction	Medium	(-)	Low	(-)
C9	Loss and fragmentation of flora	Construction	Medium	(-)	Low	(-)
C10	Increased alien vegetation species	Construction	Medium	(-)	Low	(-)
C11	Displacement of Fauna and Loss of Habitat	Construction	Medium	(-)	Low	(-)
C12	Increase in Local Traffic	Construction	Low	(-)	Low	(-)
C13	Employee Health and Safety	Construction	Medium	(-)	Low	(-)
C14	Employment Opportunities	Construction	Low	(+)	Medium	(+)
C15	Damage to Heritage and Palaeontological Resources	Construction	Low	(-)	Low	(-)

5 ENVIRONMENTAL MANAGEMENT OBJECTIVES

The EMPr has the following objectives:

- Encourage good management practices through planning and commitment to environmental issues;
- Prevent water wastage;
- Minimise disturbance of the natural environment;
- Prevent or minimise all forms of pollution;
- Promote the prevention, reduction, reuse, recycling and recovery of waste and develop waste management practices based on prevention, minimisation, recycling, treatment or disposal of waste;
- Adopt the best practical means available to prevent or minimise adverse environmental impacts;
- Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment;
- Describe all monitoring procedures required to identify impacts on the environment; and
- Train onsite personnel with regard to their environmental obligations.

Please note: This EMPr is a working document and therefore subject to change depending on the requirements of the various project phases. When applicable, these changes are to be approved in accordance with legislative requirements.

5.1 ENVIRONMENTAL OBJECTIVES AND TARGETS

To facilitate compliance to the EMPr, Eskom must comply with all relevant legislation and standards and make personnel aware of the requirements of the EMPr as well as the prescribed penalties should a non-conformance be identified during the different phases of the proposed project.

It is recommended that environmental objectives (as outlined in this document) be emphasised to Eskom as minimum requirements. Objectives include:

- Encourage good management practices through planning and commitment to environmental issues; and
- Provide rational and practical environmental guidelines to:
  - Minimise disturbance of the natural environment;
  - Minimise fugitive emissions;
  - Minimise impact of added traffic into the area
  - Ensure surface and groundwater resource protection;
  - Prevent or minimise all forms of pollution;
  - Protect indigenous flora and fauna;
  - Prevent soil erosion;
  - Promote sustainable use of resources;
  - Promote the reduction, reuse, recycling and recovery of waste;
  - Adopt the best practical means available to prevent or minimise adverse environmental impacts;
  - Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment;
  - Develop waste management practices based on prevention, minimisation, recycling, treatment or disposal of waste;

- Describe all monitoring procedures required to identify impacts on the environment;
- Define how the management of the environment is reported and performance evaluated; and
- Train onsite personnel with regard to their environmental obligations.

6 MANAGEMENT PROCEDURES AND ADMINISTRATIVE REQUIREMENTS

6.1 ORGANISATONAL STRUCTURE AND RESPONSIBILITIES

Formal responsibilities are necessary to ensure that key management measures/procedures are executed. Specific responsibilities of the Project Manager, Site Manager (Main Contractor) and Environmental Control Officer (ECO) are as defined in **Table 6-1** below.

Table 6-1: Roles and Responsibilities

RESPONSIBLE PERSON	RESPONSIBILITIES
Project Manager	– Ensure that the Site Manager and the contractor are aware of all specifications, legal constraints and Eskom's standards and procedures pertaining to the proposed development specifically with regards to environmental and social aspects; – Ensure that all conditions of the EA and EMPr are communicated and adhered to by the Site Manager and its contractor(s); – Employ a suitably qualified ECO to monitor the implementation of the EA conditions and the EMPr commitments throughout the proposed development by means of, but not limited to, site inspections and meetings. This should be documented as part of the onsite implementation records; and – Be fully conversant with the BAR for the Proposed Project, the conditions of the licenses and authorisations and of the EMPr.
Site Manager – Main Contractor	– Be fully conversant with the BAR, the conditions of the EA and of the EMPr; – Develop method statements; – Provide support to the Designated Environmental Officer (DEO) and ECO; – Be fully conversant with all relevant environmental legislation and Eskom's environmental policies and procedures and ensure compliance thereof; – Have overall responsibility for the implementation of the conditions of the EA and the EMPr; – Ensure that audits are conducted to ensure/assess compliance with the conditions of the EA and the EMPr; – Liaise with the Project Manager or his delegate, the DEO, ECO and others on matters concerning the environment; – Prevent actions that will harm or may cause harm to the environment, and take steps to prevent pollution and unnecessary degradation onsite; and – Confine project activities to demarcated areas. – Maintain the following: — A site incident register; — A non-conformance register; — A public complaints register; and — A register of audits.

RESPONSIBLE PERSON	RESPONSIBILITIES
Contractor Designated Environmental Officer (DEO)	– A suitably qualified DEO who would, on a daily basis (or as necessary depending on the construction activities), monitor the project compliance with the conditions of the EA and the EMPr; and – The costs of the DEO can either be provided by the contractor or Eskom (proof of appointment must be maintained onsite). Responsibilities of the DEO include: – Be fully conversant with the BAR, the conditions of the EA and the EMPr; – Be fully conversant with all relevant environmental legislation; – Ensure compliance with environmental policies and procedures; – Ensure that internal environmental performance audits/inspections are undertaken on a weekly basis by the Site Manager or his/her designated representative to ensure implementation onsite; – Remain employed until the completion of the construction activities; and – Report all findings identified onsite to the Project Manager.
Environmental Control Officer (ECO)	– A suitably qualified ECO who would, on a monthly basis (or as necessary depending on the construction activities), monitor the project compliance with the conditions of the EA and the EMPr; and – The costs of the ECO shall be borne by Eskom (proof of appointment must be maintained onsite). Responsibilities of the ECO include: – Be fully conversant with the BAR, the conditions of the EA and the EMPr; – Be fully conversant with all relevant environmental legislation – Ensure compliance with environmental policies and procedures – Ensure that external environmental performance audits/inspections are undertaken on a monthly to ensure implementation onsite; – Approve method statements; – Remain employed until the completion of the construction activities; – Hand over responsibilities to the operational team, if necessary; and – Report all findings identified onsite to the Project Manager. In addition, the ECO will: – Convey the contents of the conditions of the EA and the EMPr to the relevant site staff and discuss the contents in detail with the Project Manager and contractor(s); – Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the conditions of the EA and the EMPr; – Take appropriate action if the specifications contained in the EA and the EMPr are not followed; – Monitor and verify that environmental impacts are kept to a minimum, as far as possible; and – Ensure that activities onsite comply with all relevant environmental legislation.
Internal Environmental Manager - Operation	– Monitor environmental performance of the facility and its operations; – Ensure all staff remain aware of their responsibilities in terms of reducing environmental impacts. – Since the station has an Environmental Management System (EMS), include this project as part of the station's EMS.
Contractors, Staff and Service Providers	– Complying with Eskom's environmental management specifications; – Be conversant with all conditions of the EA and the EMPr, and ensure compliance thereto; and – Adhering to any environmental instructions issued by the Site Manager/Project Manager on the advice of the ECO.

6.2 ENVIRONMENTAL AWARENESS PLAN

Legislation (NEMA) requires that Eskom develop an environmental awareness plan that describes the manner in which they intend to inform employees of any environmental risks which may result from their work and the manner in which the risks must be dealt with in order to avoid pollution or the degradation of the environment. In recognition of the need to protect our environment, environmental management should not only be a legal obligation but also as a moral obligation.

It is important to ensure that all relevant personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and ongoing minimisation of environmental degradation and harm.

To achieve effective environmental management, it is important that employees, contractors (including subcontractors) are aware of the responsibilities in terms of the relevant environmental legislation and the contents of the EMPr, conditions of the EA.

Eskom will provide appropriate resources to facilitate social and environmental awareness training during the construction and operational phases of the project. Eskom will require that all managers associated with the project adhere to the mitigation/management measures detailed in the EMPr and identify, evaluate, and minimise risks to the social, physical and biophysical environments. This will be implemented by educating employees in social and environmental matters and responsibilities relating to performance of their assigned tasks. Furthermore, employees will be entrusted to maintain the necessary level of environmental performance for their activities. Contractors, and their associated sub-contractors, will also need to demonstrate compliance to mitigation/ management measures included in the EMPr.

The following methodologies described should be used to implement and ensure environmental and social awareness and competence.

6.2.1 INTERNAL COMMUNICATION

Internal Communication of environmental issues to ensure environmental awareness will be achieved by using any combination of the following means:

- Meetings;
- Memos;
- Notice boards;
- Briefs;
- Reports;
- Monthly themes;
- Daily operational bulletins;
- Newsletter;
- E-mail;
- Telephone; and
- Induction training.

6.2.2 STANDARD MEETINGS

The Safety, Health and Environmental (SHE) Meetings will be held on a monthly basis, and chaired by Senior Management. During these meetings discussions will be held regarding raising environmental awareness; identifying potential problems, and discussions regarding any complaints received and corrective actions taken.

All employees can also communicate to Senior Management through their reporting lines or by using complaint forms and incident forms to improve communication.

6.2.3 ENVIRONMENTAL AND SOCIAL TALK TOPICS

Monthly environmental and social talk topics should be compiled and distributed/shared to relevant personnel and should be displayed on appropriate notice boards or shared by whatever means established on site. As a minimum, the following topics should be considered during the course of the construction phase:

- Water Quality;
- Water Use and Consumption;
- Air Quality i.e. dust;
- Power Consumption and Energy Efficiency;
- Waste Management;
- Fauna and Flora;
- Emergency Procedures;
- Incidents Reporting;
- Systems;
- Noise;
- Heritage Impacts;
- Landowner Etiquette; Speed Limits;
- Health Risks (such as HIV/ Aids); and
- General Awareness (e.g. World Environment Day, National Arbour Day).

6.2.4 GENERAL COMMUNICATIONS

Communication to the community, government, landowners, neighbouring farmers, environmental groups, non-government organisations and other stakeholders should be communicated to ensure environmental and social awareness by means of the existing Environmental Monitoring Committee (EMC). If deemed appropriate, the following means may also be used, where necessary:

- Fax or E-mail; or
- Telephone; or
- Formal meetings; or
- Open days.

6.2.5 TRAINING

It is important to ensure that all personnel, contractors and their sub-contractors have the appropriate level of environmental awareness and competency to ensure continued environmental due diligence and on-going minimisation of environmental harm. As a minimum environmental training must include the following:

- Employees must have a basic understanding of the key environmental features of the site and the surrounding environment;
- Employees will be familiar with the requirements of the EMPr and the environmental specifications as they apply to the segments of the project where they are based;
- Employees must undergo training for the operation and maintenance activities associated with project and have a basic knowledge of the potential environmental impacts that could occur and how they can be minimised and mitigated;
- Awareness of any other environmental matters, which are deemed to be necessary by the Internal Environmental Manager; and
- Training should include the environment, health and safety as well as basic HIV/AIDS education.

The following facets of the training form part of this Environmental and Social Awareness Plan:

- **Induction:** Environmental and social awareness training will be given at induction when personnel join the company. Induction training will also be given to visitors entering the site. Induction training will include, inter alia:

  - A discussion on the environmental concept, what does it comprise of and how do we interact with it;
  - A general account of how the facility and its associated activities can affect the environment giving rise to what are called environmental impacts; and
  - A discussion on what staff can do in order to help prevent the negative environmental impacts from degrading the environment i.e. environmental impact management.
- **Job Specific Training:** Job specific training programmes will be developed as and when required. The programs will be based on the significant environmental and social aspects/ impacts that are identified during regular audits and site inspections. Supervisory staff will be equipped with the necessary knowledge and information to guide their employees on environmental and social aspects applicable to performing a specific task.
- **Competency Training**: The DEO will be responsible for the environmental and social competency and awareness training of Middle Management and supervisors. This training will be performed both on a one-on-one basis and through workshops and presentations. The effectiveness of training and development initiatives can be determined through the following methods:
  - Trend analysis of incidents reported; and
  - Analysis of work areas during visits and audits, if deemed necessary.
- **Training Records:** Training can be done either in a written or verbal format but will be in an appropriate format for the receiving audience. Persons having received training must indicate in writing that they have indeed attended a training session and have been notified in detail of the contents and requirements of the EMPr. The attendance registers must be kept on file.

6.2.6 COMPLAINTS PROCEDURE

A signboard should be erected at the entrance to the project site, informing the public of the construction activities taking place. Enquiries or complaints should be able to be received from adjacent land-users and / or the community (i.e. stakeholders) through the following channels:

- Telephone number: **014 762 6504**
- Email: **MarellEM@eskom.co.za**
- The existing Environmental Monitoring Committee (EMC)

Community enquiries or complaints must be brought to the attention of the Site Manager and ECO who should ensure corrective action and close-out. As a minimum the following information should be recorded:

- Time, date and nature of enquiry or complaint.
- The means by which the enquiry or complaints was made
- Personal details of the person / party lodging the enquiry or complaint (subject to privacy considerations).
- Actions taken to investigate and close-out the complaint as well as complainant feedback.

All complaints received are to be investigated and a response (even if pending further investigation) to be given to the complainant as soon as possible.

Any actions that cannot be managed immediately should be assigned to the appropriate personnel and will become an outstanding action. The action remains outstanding until it is closed off.

6.3 MONITORING

The following monitoring will be required on site:

- **Construction Phase:** The ECO will undertake monthly audits to ensure compliance with the EMPr and conditions of the EA during the construction activities, and will report to the Site Manager should any non-compliance be identified or corrective action deemed necessary.
- **Operational Phase:** The internal environmental manager will monitor the day-to-day site activities on an ongoing basis and will produce monitoring reports as per the station's Environmental Management Systems.

6.4 NON-CONFORMANCE AND CORRECTIVE ACTION

The auditing of the construction activities may identify non-conformances to the EMPr and conditions of the EA. Non-conformances may also be identified through incidents, emergencies or complaints recorded. In order to correct non-conformances, the source must be determined and corrective actions must be identified and implemented.

6.4.1 COMPLIANCE WITH THE EMPR AND CONDITIONS OF THE AUTHORISATIONS

- A copy of the EMPr and conditions of the EA must be available onsite at all times for the duration of the construction. During operational activities the applicable conditions may be included in the station's EMS;
- All persons employed by a contractor or their sub-contractors will abide by the requirements of the EMPr and conditions of the EA;
- Any members of the workforce found to be in breach of any of the specifications contained within the EMPr and conditions of the EA may be ordered by the Site Manager to leave the site. A contractor will not direct a person to undertake any activity which would place them in contravention of the specifications contained within the EMPr and conditions of the EA;
- Should a contractor be in breach of any of the specifications, the Site Manager will, in writing if possible, instruct the contractor responsible for the incident of non-compliance regarding corrective and/or remedial action required, specify a timeframe for implementation of these actions, implement a penalty and/or indicate that work will be suspended should non-compliance continue. Project costs and penalties incurred due to the work stoppage will be for the contravening contractor's cost; and
- Authorities will be given access to the property referred to in the EA and EMPr for the purpose of assessing and/or monitoring compliance of the site, at all reasonable times.

6.4.2 DUTY OF CARE

Under Section 28 of the NEMA, all personnel involved with the construction and operational activities onsite will be responsible for implementing measures to prevent pollution or degradation of the environment from occurring, continuing or recurring. Failure to comply with the above conditions is a breach of the duty of care. If such harm is unavoidable, steps must be taken to minimise and rectify such pollution or degradation of the environment.

6.5 DOCUMENTATION AND REPORTING

The following documentation must be kept onsite in order to record compliance with the EMPr and conditions of the EA:

- Record of complaints; and
- Record of emergencies and incidents.

The contractor will be required to report on the following:

- Environmental incidents involving contractor/employees and/or the public;
- Environmental complaints and correspondence received from the public; and
- Incidents that cause harm or may cause harm to the environment.

The above records will form an integral part of the ECO's reports and records thereof maintained for the duration of the project. These records will be kept with the EMPr and conditions of the EA, and will be made available for scrutiny if so requested by the Site Manager or his delegate and the ECO.

The contractor will ensure that the following information is recorded for all environmental complaints/incidents/emergencies:

- Nature of complaint/incident/emergency;
- Causes of complaint/incident/emergency;
- Party/parties responsible for causing complaint/incident/emergency;
- Immediate actions undertaken to stop/reduce/contain the causes of the complaint/incident/ emergency;
- Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint/incident/emergency;
- Timeframes and the parties responsible for the implementation of the corrective or remedial actions;
- Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented; and
- Copies of all correspondence received regarding complaints/incidents/emergency.

7 ENVIRONMENTAL MANAGEMENT PROGRAMME

This EMPr identifies various actions which are undertaken throughout the construction and operational phases. Not every action will be required during the entire course of activities. Therefore, the actions identified in the EMPr have been given priority timeframes for proposed implementation. **Table 7-1** below shows the structure of the EMPr.

Table 7-1: Structure of EMPr

COLUMN	DESCRIPTION
Activity/Aspect	Highlights the various activities/aspects associated with the project i.e. the contractors' activities that will interact with the environment.
Environmental Measures and Action Plans	Indicates the actions required to prevent and /or minimise the potential impacts on the environment that are associated with the project.
Responsibility	Indicates the party responsible for implementing the environmental measures and action plans laid out in the EMPr. Please note that the Site Manager will have authority to stop works if/as necessary.
Priority Timeframe	Indicates when the actions for the specific aspect must be implemented and/or monitored.

The following assumptions have been made in the development of the environmental specification in this EMPr:

- An environmental file containing the information/documentation required by this EMPr is to remain onsite and to be made available at the request of the auditor or similar monitoring body; and
- For ease of reference, any person(s) employed to assist in the project i.e. contractors, sub-contractor and permanent and temporary staff, will be collectively referred to as 'onsite personnel'.

It should be noted that at this point of the project planning process, the necessity for and timing of the decommissioning phase is unknown. Before decommissioning, Eskom will need to follow the related legal permitting process in terms of the NEMA and other legislation applicable at the time. The future associated permitting process will further supplement any commitments made within this document.

Table 7-2 outlines the EMPr for the proposed project.

None of the management measures are required to be included in the EA and there are no additional monitoring requirements.

Table 7-2: Environmental Management Programme

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
CONTRACTOR LAYDOWN AREA AND SITE ACCESS			
Objectives: – To implement measures to minimise impacts on the environment from the initiation of construction activities through planning, careful site access route selection and implementation of mitigation measures. Indicator and Compliance Mechanisms: – Health, safety, environmental and community incident and complaints management system register. – Close-out on incidents. – Monitoring and audit reports. – Inductions training and register. – Environmental awareness programme/toolbox talks.			
Project Initiation of Construction Activities	Appoint an internal DEO and an ECO to manage and verify compliance with the EA and EMPr.	Contractor (Site Manager)	Once-Off
	Ensure construction activities remain within the demarcated project footprint.	ECO DEO Site Manager	Construction
	A training plan/programme developed to focus on Environmental, Health and Safety Aspects.	Contractor (DEO)	Construction Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Site clearing must be limited to the footprint of the infrastructure requirements.	ECO Contractor (DEO) Site Manager	Construction
	Any no go areas identified should be demarcated before the construction or decommissioning commences.	ECO Contractor (DEO) Site Manager	Pre-Construction Pre-Decommissioning
	A site layout plan which indicates site access points; stockpile locations; temporary waste storage areas; and other significant development infrastructure must be developed, approved and complied with.	ECO Contractor (DEO)	Construction
	Locate firefighting measures onsite, such as fire extinguishers, and make personnel aware of fire prevention and firefighting measures. Firefighting equipment must be securely placed and inspected monthly.	ECO Contractor (DEO)	Construction

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
VEHICLE, EQUIPMENT AND MACHINERY MANAGEMENT			
Objectives: – To implement measures to minimise impacts on the environment from poorly maintained equipment, machinery and vehicles onsite. Indicator and Compliance Mechanisms: – Health, safety, environmental and community incident and complaints management system register. – Close-out on incidents. – Monitoring and audit reports. – Transport route delineation. – Compliance with SANS 10228. – Daily equipment, machinery and vehicle checklists. – Incident Classification and Reporting Procedure.			
Vehicle Maintenance	No maintenance activities must occur on site.	ECO Contractor (DEO)	Construction
Operation of Equipment, Machinery and Vehicles	Ensure that the equipment, machinery and vehicles are adequately maintained so as to: – Reduce the potential for spillages of oil, diesel, fuel or hydraulic fluid. – Ensure road-worthiness. – Reduce emissions.	ECO Contractor (DEO) Operator	Construction Operation
	Vehicles bearing open loads of potentially wind-borne materials must be covered or wet down in order to minimise dust entrainment.	Contractor (DEO) Operator	Construction

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
Traffic Congestion	The movement of vehicles into and out of the site must be managed to ensure the impact on public areas is minimised, such as ensuring that abnormal loads are moved outside of peak traffic hours, and reasonable measures are taken to ensure that public and staff safety is managed adequately.	Contractor (DEO) Operator	Construction
FUEL AND CHEMICAL MANAGEMENT			
Objectives: – To ensure the correct storage, handling and disposal of fuels and chemicals in order to prevent impacts to the surrounding environment. Indicator and Compliance Mechanisms: – Maintenance records. – Material safety data sheets (MSDS). – Health, safety, environmental and community incident and complaints management system register. – Chemicals Management Procedure. – Monitoring and audit reports. – Training records.			
Fuel and Chemical Management	Develop an Incident Classification and Reporting Procedure for fuel and chemical management including storage, handling and spillages.	ECO Contractor (DEO)	Construction
	Indicate the location of the fuel and chemical storage area on the layout plans.	Contractor (DEO)	Construction
	In cases where a surface leak occurs during loading and off-loading activities, the spill material will be cleaned using a spill kit.	Contractor (DEO) Operator	Construction

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Securely fence and lock the storage areas to accommodate all hazardous substances such as fuel, oils and chemicals. The storage area floor must be an impermeable surface and suitably bunded as per the requirements outlined in SANS 10089-1 (2008). If storage capacity is triggers licencing, those should be acquired.	ECO Contractor (DEO)	Construction
	Label all liquids (chemicals and hydrocarbons) stored onsite for easy identification. Material safety data sheets (MSDS) for onsite chemicals, hydrocarbon materials and hazardous substances must be readily available. MSDS must include mitigation measures to ameliorate potential environmental impacts which may result from a spill, incorporating health and safety mitigation measures.	Contractor (DEO)	Construction
	Keep fuels, oils or other chemicals used outside of the bunded area to a minimum and use suitable secondary containment in the form of drip trays.	ECO Contractor (DEO)	Construction
Health and Safety	Display “no smoking” and “no naked flame” signs in and around the project area, as well as near the hazardous material store.	ECO Contractor (DEO) Operator	Construction

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
WASTE MANAGEMENT			
Objectives: – To ensure the correct handling, storage, transportation and disposal of general waste and hazardous waste. Indicator and Compliance Mechanisms: – Induction training and records. – Waste Management Plan (WMP). – Relevant SANS Codes of Practice. – Waste Manifests (all waste streams), waybills (general waste) and Safety disposal certificates (hazardous waste). – Emergency preparedness and response procedure. – Incident Classification and Reporting Management Procedure. – Health, safety, environmental and community incident and complaints management system register. – Monitoring and audit reports.			
General Waste Management	General waste generated as a result of construction activities must be managed in accordance with the WMP (Section 8.1 of this EMPr). The procedure must be reviewed to ensure compliance with legislative amendments.	Contractor (DEO) Operator	Construction Operation
	Train and inform all onsite personnel regarding general waste minimisation, management and disposal as per the WMP.	Contractor (DEO)	Construction Operation
	Prohibit littering and burning of waste onsite.	Contractor (DEO)	Construction
	Place an adequate number of general waste bins around the site during construction activities in order to minimise littering. The bins must be removed from the site on a regular basis for disposal at a registered or licensed disposal facility.	Contractor (DEO)	Construction

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Retain records of appropriate safety disposal associated with waste removal, transportation and disposal.	Contractor (DEO)	Construction
	Prohibit the mixing of general waste with hazardous waste. Should general waste be mixed with hazardous waste, it will be considered hazardous waste. See below for managing hazardous waste.	Contractor (DEO)	Construction
	Recover, recycle and reuse waste where possible.	Contractor (DEO)	Construction
Hazardous Waste Management	Any recyclable material which is considered hazardous is to be collected and transferred by a permitted/trained waste contractor in accordance with the SANS 10228 for transport to the approved recycling/recovery facility.	Contractor (DEO)	Construction
	Train and inform all onsite personnel regarding hazardous waste minimisation, management and disposal as per the WMP in Section 8.1 of this EMPr.	Contractor (DEO)	Construction
	Clean areas where hazardous waste spills have occurred and dispose of the hazardous material appropriately. Key personnel must be trained on handling spillages.	Contractor (DEO)	Construction
	Retain records of appropriate safety disposal certificates associated with hazardous waste removal, transportation and disposal.	Contractor (DEO)	Construction
	The emergency preparedness and response plan (Section 8.6 of this EMPr) must be implemented. The plan must be placed in key locations around the site, visible to all employees.	Contractor (DEO) Operator	Construction Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Ensure that waste manifest documentation (as per the Waste Classification and Management Regulations – GNR 634) is prepared and maintained for the generation, transportation and disposal of waste.	Contractor (DEO)	Construction
	Report any major spill incidents to the Department within 24 hours of occurrence.	Contractor (DEO)	Construction
FLORA AND FAUNA MANAGEMENT			
Objectives: – To prevent any loss of diversity of indigenous faunal communities and continued encroachment and displacement of indigenous vegetation community by alien invasive plant species, particularly in previously disturbed areas. Indicator and Compliance Mechanisms: – Induction training and records. – Monitoring and audit reports.			
Vegetation Management	All construction related activities (soil stockpiles, vegetation clearing etc.) and infrastructure (site camps, laydown and storage) must occur within the boundary of target properties. Areas outside the development footprint or approved access / laydown areas are to be considered to be 'No-Go' areas for workers, machinery, equipment and vehicles.	Site Manager Contractor (DEO)	Construction
	The demarcation work must be signed off by the ECO before any work commences. Demarcations are to remain until construction and rehabilitation is complete	ECO Contractor (DEO)	Construction
	Access to and from the development area must be either via existing roads or within the construction servitude.	Site Manager Contractor (DEO)	Construction

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	No clearing of indigenous vegetation outside of the defined working servitudes is permitted for any reason (i.e. for fire wood or medicinal use).	Contractor (DEO)	Construction
	Update and implement the alien vegetation management plan (Section 8.2 of this EMPr) for the entire site.	Contractor (DEO)	Construction
	Ensure that topsoil used for rehabilitation is free of any weed species.	DEO Contractor	Post Construction
	All invader or exotic plant species must be removed from the site and disposed of at a landfill site.	Contractor (DEO) Operator	Construction Operation
	Only indigenous floral species (preferably using endemic or local species from the area), which are water wise and require minimal horticultural practices must be used during landscaping and rehabilitation.	Contractor (DEO)	Post Construction
	Remaining indigenous trees (naturally occurring in the area) must be retained wherever possible.	Contractor (DEO)	Post Construction
Fauna Management	Ensure that construction activities are limited only to the demarcated and approved areas.	Contractor (DEO)	Construction
	Education of workers/employees onsite on not to harm wildlife unnecessarily will assist in mitigating this impact. Contractor induction and staff/labour environmental awareness training needs are to be identified and implemented through staff/contractor environmental induction training. This must include basic environmental training based on the requirements of the EMPr, including training on avoiding and conserving local wildlife.	Contractor (DEO) Operator	Construction Operator

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Collect any snakes or animals that are discovered during construction and operation and investigate where to move them. No wild animal must under any circumstance be hunted, snared, captured, injured, killed, harmed in any way or removed from the site. This includes animals perceived to be vermin (such as snakes, rats, mice, etc.).	Contractor (DEO) Operator	Construction Operation
	If any faunal species of conservation importance are recorded during construction, activities must temporarily cease and an appropriate specialist must be consulted to identify the correct course of action.	Contractor (DEO)	Construction
SOIL AND LAND MANAGEMENT			
Objectives: – To prevent any disturbance, erosion or contamination of soil resources. Indicator and Compliance Mechanisms: – Induction training and records. – WMP. – Incident Classification and Reporting Management Procedure. – Health, safety, environmental and community incident and complaints management system register. – Monitoring and audit reports. – Stormwater Management Plan.			
Soil and Land Management	Implement soil erosion management measures and ensure no erosion gullies are allowed to form within the area under management.	Site Manager Contractor (DEO)	Construction

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Stormwater control systems, in line with the conceptual Stormwater Management Plan (SWMP) must be implemented within the site and must be managed and maintained to ensure no contamination of soil reserves.	Site Manager Contractor (DEO)	Construction
	All excavations and foundations must be inspected regularly for any silting.	Site Manager Contractor (DEO)	Construction
	Machinery must be regularly checked to ensure hydrocarbon leaks (including fuel and hydraulic fluids) are not occurring. Drip trays must be used where necessary. Fuels and oils must be stored within bunded areas. No repair work must be undertaken on machinery onsite or campsite area.	Site Manager Contractor (DEO)	Construction
	Drip trays are to be utilised during daily greasing and re-fuelling of machinery and to catch incidental spills and pollutants. Drip trays are to be inspected daily for leaks and effectiveness, and emptied when necessary. This is to be closely monitored during rain events to prevent overflow.	Site Manager Contractor (DEO)	Construction
	Keep spill kits onsite and train personnel to use them appropriately.	Site Manager Contractor (DEO)	Construction
	Ensure that there are sufficient ablution facilities. If portable toilets can be installed for the construction phases, ensure that they in accordance with Occupational Health and Safety Act, (No 85 of 1993).	Site Manager Contractor (DEO)	Construction

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
WATER MANAGEMENT			
Objectives: – To implement measures to prevent the contamination on surface and groundwater resources. – To prevent erosion. Indicator and Compliance Mechanisms: – Induction training and records. – Incident Classification and Reporting Management Procedure. – Environmental awareness programme/toolbox talks. – Stormwater Management Plan.			
Surface Water Management – Stormwater Management	To prevent contamination, ensure that there is no storage and handling of materials (i.e. chemicals and waste material) within the designated "clean water areas".	Site Manager Contractor (DEO)	Construction
	Spills must be appropriately managed on site, including within bunds, where relevant.	Site Manager Contractor (DEO)	Construction
	Remove accumulated sediments and debris at the inlet, outlet, within the conduits and open-top culverts.	Site Manager Contractor (DEO) Operator	Construction Operation
	Maintenance and Repair of erosion damage at the culvert's inlet and outlet must be undertaken.	Site Manager Contractor (DEO) Operator	Construction Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Compile and implement a stormwater management plan to control the flow of stormwater and limit the potential of dirty water from mixing with clean water sources.	Site Manager Contractor (DEO) Operator	Construction Operation
	Machinery must be regularly checked to ensure hydrocarbon leaks (including fuel and hydraulic fluids) are not occurring. Drip trays must be used where necessary. Fuels and oils must be stored within bunded areas. Parking areas for staff vehicles must ideally be placed on hardstanding to limit the impacts of oil leaks to the environment.	Site Manager Contractor (DEO)	Construction
	Acquire spill kits to clean up any hydrocarbon or chemical spills during construction to prevent seepage.	Site Manager Contractor (DEO)	Construction
	Oils, greases, diesel and other chemicals will be stored in the prescribed manner and within bunded areas to prevent surface water contamination. No repairs must be undertaken on the site.	Site Manager Contractor (DEO)	Construction
	All stormwater generated by the medium to high risk contamination 'dirty' areas must not be allowed to discharge into the surrounding environment.	Site Manager Contractor (DEO)	Construction
	Separate dirty and clean water by implementing the existing clean and dirty water systems/structures to prevent pollution of clean water runoff.	Site Manager Contractor (DEO)	Construction

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Any cement mixing shall be completed on impervious hardstanding surfaces to prevent spillage to the environment.	Site Manager Contractor (DEO)	Construction
	The site must be contoured as according to allow for surface water to readily drain away and to prevent ponding of water anywhere within the site.	Site Manager Contractor (DEO)	Construction
Groundwater Management	Areas with the potential to contaminate the groundwater must be underlain by hardstanding of suitable integrity.	Site Manager Contractor (DEO)	Construction
	Acquire spill kits to clean up any hydrocarbon or chemical spills during construction, operation and closure to prevent seepage. All spillage incidents must be reported to the responsible site officer as soon as they occur.	Site Manager Contractor (DEO)	Construction
	Oils, greases, diesel and other chemicals will be stored in the prescribed manner and within bunded areas to prevent surface water contamination. The site must be contoured as according to the conceptual stormwater management plan to allow for surface water to readily drain away and to prevent ponding of water anywhere within the site.	Site Manager Contractor (DEO)	Construction
	Any cement mixing shall be completed on impervious hardstanding surfaces to prevent spillage to the environment	Site Manager Contractor (DEO)	Construction
Fire	Follow the fire management plan (Section 8.5 of this EMPr) for fire management. Contractors must prove compliance with the emergency response plan.	Site Manager Contractor (DEO) Operator	Construction Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	No open fires to be permitted on construction sites. Fires must only be made within the construction camp and only in areas and for purposes approved by the ECO.	Site Manager Contractor (DEO)	Construction
	Fire prevention facilities must be present at all hazardous storage facilities. Ensure adequate fire-fighting equipment is available and train workers on how to use it.	Site Manager Contractor (DEO)	Construction
	Ensure that all workers on site know the proper procedure in case of a fire occurring on site. Smoking must be prohibited in areas considered to be a fire hazard.	Site Manager Contractor (DEO)	Construction
	Provide suitable fire control measures. No smoking shall be allowed in areas of natural habitat where accidental fires could occur. Follow the fire management plan (Section 8.5 of this EMPr) to curb any accidental fires.	Site Manager Contractor (DEO)	Construction
	All activities where a threat of potential fire is identified shall comply with minimum fire control regulations.	Site Manager Contractor Operator	Construction Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
NOISE MANAGEMENT			
Objectives: – To ensure that noise impacts to the surrounding environment are minimal or mitigated. Indicator and Compliance Mechanisms: – Maintenance records. – Incident reporting system. – Induction training and records. – Health, safety, environmental and community incident and complaints management system register. – Monitoring and audit reports. – Records of Personal Protective Equipment (PPE). – Incident Classification and Reporting Management Procedure.			
Noise	Fit equipment, machinery and vehicles generating excessive noise with appropriate noise abatement measures, if deemed necessary, and undergo regular maintenance to ensure optimum efficiency during operation.	Site Manager Contractor (DEO) Operator	Construction Operation
	Provide a complaints register to report any excessive noise incidents.	Site Manager Contractor (DEO)	Construction
	Onsite employees must be provided relevant PPE. Onsite personnel are responsible for maintaining their PPE and implementing it during construction activities.	Site Manager Contractor (DEO) Operator	Construction Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Ensure regular maintenance of equipment to reduce the generation of additional unwanted noise.	Site Manager Contractor (DEO)	Construction
SITES OF CULTURAL OR HERITAGE SIGNIFICANCE			
Objectives: – To ensure that sites/artefacts of heritage value are identified and protected. Indicator and Compliance Mechanisms: – Health, safety, environmental and community incident and complaints management system register. – Incident Classification and Reporting Management Procedure. – Monitoring and audit reports.			
Cultural and/or Heritage Sites and Palaeontology	In the event that an artefact or heritage site be uncovered, work in the vicinity must cease, representatives of the South African Heritage Resources Agency (SAHRA) must be contacted and an archaeological consultant must be appointed to assess the site. Work must only resume, once clearance is given in writing by the archaeological consultant.	Site Manager Contractor (DEO)	Construction

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
HEALTH AND SAFETY			
Objectives: – To ensure communication with members of the public to promote safety awareness. – To prevent public access to construction sites and storage areas. – To ensure safety for all onsite personnel. Indicator and Compliance Mechanisms: – Induction training and records. – Health, safety, environmental and community incident and complaints management system register. – Monitoring and audit reports. – Incident Classification and Reporting Management Procedure. – PPE Register. – Occupational health and safety plan. – Health and safety protocol. ***Note: The proposed project aims to improve the overall SHE status of the site.***			
Health and Safety	All onsite personnel are required to undergo induction training and regular toolbox talks in order to raise awareness of the conditions contained herein.	Site Manager Contractor (DEO)	Construction
	The appointed contractor will be responsible for the development of a comprehensive health and safety protocol which must be adhered to.	Contractor	Construction
	Provide and wear appropriate PPE onsite.	Contractor Operator	Construction Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Train all onsite personnel handling chemical or hazardous substances in the use of such substances and the environmental, health and safety consequences of incidents.	Site Manager Contractor	Construction
	Provide onsite personnel with sufficient potable water for drinking.	Site Manager Contractor	Construction
Public Safety	Restrict public access by employing full time security for the site.	Site Manager Contractor Operator	Construction Operation
SOCIO-ECONOMIC ENVIRONMENT			
Objectives: – To ensure that the negative socio-economic impacts are mitigated and managed. – To ensure that the positive socio-economic impacts are enhanced. Indicator and Compliance Mechanisms: – Employment records and community engagement local enterprise development records.			
Local Awareness Training	As far as possible, contractors and labour must be sourced locally from within the local communities.	Project Manager Contractor	Construction
	Train employees to gain skills they can use in the future.	Project Manager Contractor	Construction

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Consult with local communities to boost local business.	Project Manager Contractor	Construction
AIR QUALITY			
Objectives: – To ensure that air quality impacts to the surrounding area is kept to a minimum or mitigated as far as possible. – To ensure that odour impacts to the surrounding environment are minimal or mitigated Indicator and Compliance Mechanisms: – Maintenance records. – Incident reporting system. – Induction training and records. – Health, safety, environmental and community incident and complaints management system register. – Monitoring and audit reports. – Odour Management Plan. – Air Quality Impact Assessment. – Records of Personal Protective Equipment (PPE).			
Dust and Particulate Matter	When required, dust suppression methods such as water suppression must be used, especially during dry and windy periods. Dust must be visually monitored on a daily basis and minimised where possible to ensure emissions are minimised.	Site Manager Contractor (DEO)	Construction
	All stockpiles must be restricted to designated areas and must not exceed a height of two (2) metres.	Site Manager Contractor (DEO)	Construction

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	All materials transported to site must be transported in such a manner that they do not fly or fall off the vehicle. This may necessitate covering or wetting friable materials.	Site Manager Contractor (DEO)	Construction
	Ensure that all vehicles and machines are adequately maintained to minimise emissions.	Site Manager Contractor (DEO)	Construction
	No burning of waste, such as plastic bags, cement bags and litter is permitted.	Site Manager Contractor (DEO)	Construction
	It is recommended that the clearing of vegetation from the site must be selective and done just before construction so as to minimise erosion and dust. Should construction in areas that have been stripped not be commencing within a short period of time the exposed areas shall be re-vegetated or stabilised.	Site Manager Contractor (DEO)	Construction
REHABILITATION			
Objectives: – To return disturbed sites to a natural state characteristic to the area.			
Rehabilitation and Landscaping	Re-vegetate areas disturbed by excavations and site laydown using indigenous species for rehabilitation.	Site Manager Contractor (DEO)	Post Construction
	All areas disturbed by construction activities must be inspected for contamination, remediated if necessary and then maintained/landscaped to ensure efficient stormwater drainage.	Site Manager Contractor (DEO)	Post Construction

8 MANAGEMENT PLANS

A number of generic management plans have been included in the EMPr. The plans included below provide an indication of the requirements that must be followed on the proposed construction of the raw water and make-up water pipeline project. It must be noted that many of these plans can be updated at any stage depending on any changes that may occur on the site.

The following specific plans have been compiled:

- Waste Management Plan;
- Alien / invasive Plant Management Plan;
- Plant Rescue and Protection Plan;
- Re-vegetation and Habitat Rehabilitation Plan;
- Fire Management Plan;
- Emergency Response Plan;
- Stormwater Management Plan; and
- Erosion Management Plan.

8.1 WASTE MANAGEMENT PLAN

8.1.1 WASTE HIERARCHY

A waste is any solid, liquid or contained gaseous material that is being discarded by, disposal, recycling, burning or incineration. Waste management options for a particular waste need to be considered according to the Waste Management Hierarchy (**Figure 8-1**) which reflects the relative sustainability of each of the options. One of the key principles underlying the waste management hierarchy is to ensure that waste is dealt with as high up the waste hierarchy as possible. Since all waste disposal options have some impact on the environment, the only way to avoid impact is not to produce waste in the first place, and waste reduction is therefore at the top of the hierarchy. Re-use, followed by recovery techniques (recycling, composting and generating energy from waste) follow, while disposal to landfill or by incineration (the worst options) are at the bottom of the hierarchy.

In deciding on the most appropriate disposal route, both environmental and economic costs and benefits need to be considered. This decision should be reached taking into account all the costs and impacts associated with waste disposal, including those associated with the movement of waste.

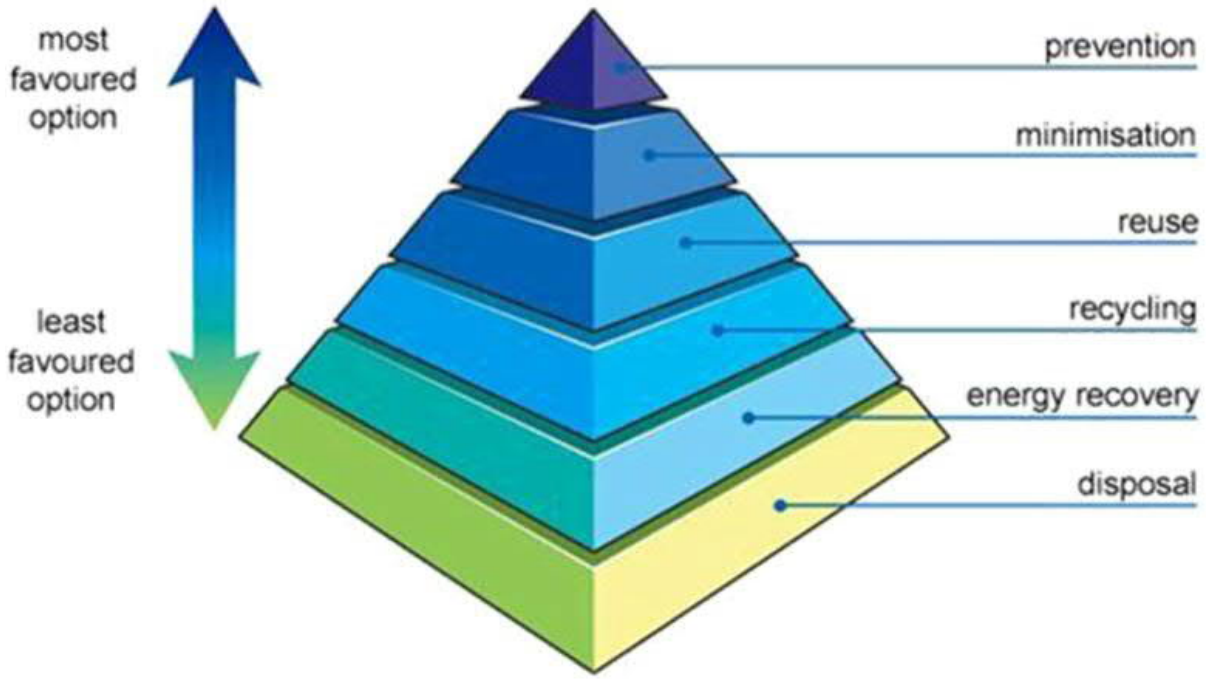

Figure 8-1: Waste Hierarchy

8.1.2 PROJECT STAGES

The purpose of this section is to assess the construction, operational processes of the facility in order to identify short comings, like raw materials procurement, infrastructure, employee training, health and safety, transportation, storage, compliance with legislative requirements, emergency preparedness and waste streams arising from an operation and its related activities, as well as the current waste management practices per waste stream. The assessment serves as the baseline against which any problem areas or gaps in waste management practises, process technology and environmental authorisations are identified and against which future performance objectives, activities and targets can be set.

The project stages are described below with the waste generation and management methods described in the corresponding tables below them including:

- Details on how waste will be managed during the construction, operational phases taking into consideration the waste management hierarchy;
- Details of the procedure for the separation of non-recyclable and recyclable waste;
- Details of the management of non-recyclable waste i.e. how waste will be stored on site during construction and operational phases, including the frequency for the removal of waste from the site and an indication of the landfill site where it will be disposed;
- Details for the management of recyclable waste e.g. the type of waste materials that will be recycled on site and the details pertaining to the offloading, sorting, handling, storage and collection procedures for the waste types (e.g. compaction and bailing, breaking of glass etc.); and
- The frequency for the removal of waste from the proposed development to where it will be finally managed must be included.

Waste Management at the project site will be undertaken in line with the EMPr to consider the correct disposal of general and hazardous waste generated on the site. **Table 8-1** describes the different waste products that the proposed project will produce, as well as the various options to dispose of them. Waste will mainly be generated during both construction activities when contractors spend considerable amount of time on the site. During operation, contractors are only on the site for limited amount of time as and when maintenance is required.

Table 8-1: Waste Management Options

WASTE	TYPE OF WASTE	MANAGEMENT OPTIONS
Hydrocarbons (Contaminated soil)	Hazardous	Fuel and oil spillages can be a source of contamination of water sources and the soil. Management options include: – Using spill kits to clean any spillages; – Ensure storage facilities are maintained and meet industry regulations; – Transportation and storage of fuel must be regulated and correctly managed according to the EMPr; and – All hazardous waste is to be disposed of at a registered/authorised hazardous landfill (safe disposal certificates must be obtained).
Contaminated PPE	Hazardous	PPE can be contaminated during handling of hydrocarbons. Management options include: – Store contaminated PPE in hazardous waste skips; – Ensure contaminated PPE is disposed of at a registered hazardous landfill (safe disposal certificates must be obtained).
Office waste	General	Office waste (inorganic matter) can be disposed of as per normal and form part of the municipal waste management system. – Ensure waste is stored securely in refuse bins or selected areas; – Co-ordinate waste removal with the general removal of waste from the Medupi Power Station
Food waste	General	Food waste is generated as site personnel take their meals on the site camp. Management options include: – Store any waste and packaging into a labelled food waste bin; and – Co-ordinate waste removal with the general removal of waste from the Medupi Power Station.

8.1.3 WASTE MANAGEMENT ROLES AND RESPONSIBILITIES

In order to facilitate effective waste management, the relevant authorities, roles and responsibilities shall be defined, documented and communicated within, and through implementation of, the WMP. Management shall provide resources essential to the implementation and control of the WMP, including human resources, technology, and financial resources.

Eskom will appoint specific management representative(s) who, irrespective of other responsibilities, shall have defined roles, responsibility, and authority for waste management of the facility.

The different role players in the waste management process include:

– Site manager;
– DEO during construction;
– Waste contractors; and
– Staff.

Table 8-2 provides an overview of the roles and responsibilities of individuals on site related to construction and operational activities.

Table 8-2: Roles and Responsibilities

ROLE PLAYER	RESPONSIBILITIES
Site Manager Project Manager	– Implement WMP authorised by DEA; – Review and authorise updates to the WMP; – Ensure resource allocation for implementation of the WMP requirements; – Ensure that WMP requirements are integrated into project plans, work method statements, tender and contract documents; – Ensure necessary support to the DEO for implementation of the WMP; and – Participate in incident investigations (as required).
Designated Environmental Officer	– Update the WMP where necessary; – Ensure that WMP requirements are implemented on the site during construction; – Ensure communication of WMP requirements to relevant contractor and sub-contractor personnel; – Facilitate environmental induction of all project staff and either deliver or coordinate delivery of all such training that would be required for the effective implementation of the WMP. This includes identifying additional project training requirements and implementing the training programme; – Ensure maintenance of site document control requirements; – Ensure that contractors use the appropriate disposal methods and facilities; – Maintain training records for all project personnel including contractors; – Maintain environmental incidents and complaints register for construction; – Report significant incidents internally and externally as required by law and the conditions of EA upon receipt; – Investigate incidents and recommend corrective and preventative actions; – Undertake environmental system reviews, site inspections, audits and other verification activities to assure that the WMP implementation is at an optimal level; – Participate in environmental performance verification activities to verify the level of compliance with the WMP in delivering the legal and environmental obligations; – Provide support and advice to the contractor and all sub-contractors in the implementation of WMP procedures and corrective actions; and – Ensure that contractors use the appropriate disposal methods and facilities.
Waste contractors	– Adhere to WMP requirements; – Ensure all waste contractors are appropriately certified as waste transporters; – Use the appropriate disposal methods and licensed facilities; – Provide the required waste manifests and safe disposal certificates; and – Ensure that personnel are appropriately trained in waste handling and transporting.
Staff	– Attend WMP training; and – Follow WMP requirements including waste separation and recycling appropriately.

8.2 ALIEN / INVASIVE PLANT MANAGEMENT PLAN

The purpose of this Plan is to provide a framework for the management of alien and invasive plant species during the construction and operation of the project, which in turn serves to manage open spaces, as required. The broad objectives of the plan include the following:

– Ensure alien plants do not become dominant in parts or the whole site through the control and management of alien and invasive species presence, dispersal and encroachment.
– Managing and maintaining the ecosystem in a near-natural state and restoring and/or rehabilitating the ecosystems to such a state.
– Develop and implement a monitoring and eradication programme for alien and invasive species.
– Promote the natural re-establishment and planting of indigenous species in order to retard erosion and alien

plant invasion.

Mitigation and management measures include, but are not limited to the following:

- Stockpiles must be kept clear of weeds and alien vegetation growth by regular weeding.
- Alien vegetation and the spread of exotic species on the site will need to be controlled.
- The contractor must be responsible for implementing a programme of weed control (particularly in areas where soil has been disturbed); and grassing of any remaining stockpiles to prevent weed invasion.
- Herbicide use shall only be allowed according to contract specifications. The application shall be according to set specifications and under supervision of a qualified technician. The possibility of leaching into the surrounding environment shall be properly investigated and only environmentally friendly herbicides shall be used.
- The use of pesticides and herbicides on the site must be discouraged as these can impact on important pollinator species of indigenous vegetation.
- Six monthly checks of the area must take place for the emergence of invader species.
- Mitigation measures mentioned for the construction phase above must be implemented for any maintenance of the development that is undertaken during the operation phase.
- Correct rehabilitation with locally indigenous species.
- Monitoring programme to ensure that rehabilitation efforts are successful to ensure that risks such as erosion, spread of exotic species and the edge effect are avoided.
- Constant maintenance of the area to ensure re-colonisation of floral species.
- Regular removal of alien species which may jeopardise the proliferation of indigenous species.

8.3 PLANT RESCUE AND PROTECTION PLAN

The purpose of the plant rescue and protection plan is to implement avoidance and mitigation measures, in addition to the mitigation measures included in the EMPr to reduce the impact of the development of the project on listed and protected plant species and their habitats, and to provide guidance on search and rescue of species of conservation concern.

Mitigation and management measures include, but are not limited to the following:

- Vegetation clearing must only commence after a walk down has been conducted by a suitably qualified ecologist / botanist and the necessary permits obtained.
- Vegetation clearing to be kept to a minimum. No unnecessary vegetation to be cleared.
- Vegetation removal must be limited to the construction site and must be removed only as it becomes necessary rather than removing all the vegetation throughout the site at once
- Materials must not be delivered to the site prematurely which could result in additional areas being cleared or affected.
- No vegetation to be used for firewood.
- Gathering of firewood, fruit, medicinal plants, or any other natural material onsite or in areas adjacent to the site is prohibited unless with prior approval of the ECO.
- Construction site office and laydown areas must be clearly demarcated and no encroachment must occur beyond demarcated areas.
- All natural areas impacted during construction must be rehabilitated with locally indigenous plant species.
- A buffer zone must be established in areas where construction will not take place to ensure that construction activities do not extend into these areas.
- The use of pesticides and herbicides in the study area must be discouraged as these impacts on important pollinator species of indigenous vegetation.
- Soil stockpiles must not become contaminated with oil, diesel, petrol, garbage or any other material, which may inhibit the later growth of vegetation in the soil. Spillage can result in a loss of soil functionality thus limiting the re-establishment of flora.

8.4 RE-VEGETATION AND HABITAT REHABILITATION PLAN

The purpose of the rehabilitation plan is to ensure that areas cleared or impacted during construction activities are rehabilitated with a plant cover that reduces the risk or erosion from these areas as well as restores some ecosystem function. The purpose of the rehabilitation plan for the site can be summarised as follows:

- Achieve long-term stabilisation of all disturbed areas to minimise erosion potential.
- Re-vegetate all disturbed areas with suitable local plant species.
- Minimise visual impact of disturbed areas.
- Ensure that disturbed areas are safe for future uses.

Mitigation and management measures include, but are not limited to the following:

- Re-vegetation must aim to accelerate the natural succession processes so that the plant community develops in the desired way, i.e. promote rapid vegetation establishment.
- Re-vegetation of disturbed surfaces must occur immediately after construction activities are completed. This must be done through seeding with locally indigenous species typical of the representative botanical unit.
- Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction.
- Seeds from surrounding seed banks can be used for re-seeding.
- Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas.
- Planting of indigenous tree species in areas not to be cultivated or built on must be encouraged.
- Monitoring programme to ensure that rehabilitation efforts are successful to ensure that risks such as erosion, spread of exotic species and the edge effect are avoided.

8.5 FIRE MANAGEMENT PLAN

The purpose of this plan is to address firefighting requirements throughout the construction of the project and to preserve and protect human life as well as tangible goods and equipment in the event of a fire.

Mitigation and management measures include, but are not limited to the following:

- All construction camps shall be provided with portable fire extinguishing equipment, in accordance with all relevant legislation and must be readily accessible.
- The Contractor shall take specific measures to prevent the spread of veld fires, caused by activities at the campsites. These measures must include appropriate instruction of employees about fire risks and designated smoking areas.
- Fire prevention facilities must be present at all storage facilities. No open fires shall be allowed on site under any circumstance. All cooking shall be done in demarcated areas that are safe and cannot cause runaway fires.
- The Contractor shall have operational fire-fighting equipment available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process.
- Emergency numbers for local police and fire department etc. must be placed in a prominent area.
- Firefighting equipment must be placed in prominent positions across the site where it is easily accessible. This includes fire extinguishers, a fire blanket as well as a water tank.
- All construction staff must be trained in fire hazard control and firefighting techniques. Translators are to be used where necessary.
- All flammable substances must be stored in dry areas which do not pose an ignition risk to the said substances.
- Smoking must only be conducted in demarcated areas.
- Firefighting equipment must be regularly maintained by an appropriate company.

8.6 EMERGENCY RESPONSE PLAN

Appropriate resources must be provided to respond to accidental and emergency situations for operations and activities during construction and operation phases. The procedures will include plans for addressing training, resources, responsibilities, communication and all other aspects required to effectively respond to emergencies associated with their respective hazards.

This Emergency Response Plan (ERP) is intended as a practical working document for the proposed construction of the raw water and make-up water pipeline project. The purpose of this document is to provide the basic guidelines on how to respond to potential emergency situations that may arise as at the pipeline route. These potential emergency situations include medical emergencies and fires.

All activities associated with the project will require site-specific emergency response plans to mitigate impacts, which meet or exceed all applicable regulations.

The objectives of this plan are as follows:

- Protect the communities and the environment through the development of emergency response strategies and capabilities;
- Set out the framework for hazard identification in order to define procedures for response to the situations including the development of contingency measures;
- Structure a process for rapid and efficient response to and manage emergency situations during the construction and operational phases of the project; and
- Assign responsibilities for responding to emergency situations.

The ERP must take the incident procedures referred to in Section 30 of the NEMA into account.

8.6.1 ROLES AND RESPONSIBILITIES

With respect to this plan, Eskom has the responsibility to:

- Provide emergency response services and to structure and coordinate emergency response procedures for the project;
- Ensure that specific emergency responsibilities allocated to them are organised and undertaken; and
- Ensure that employees and contractor third parties are trained and aware of all required emergency procedures.

Roles, responsibility and authority shall be defined, documented and communicated in order to facilitate effective emergency response through implementation of the ERP. Management shall provide resources essential to the implementation and control of the ERP including: human resources, technology, and financial resources.

Eskom shall appoint specific emergency response representative(s) who, irrespective of other responsibilities, shall have defined roles, responsibility, and authority for emergency response of the facility.

The sections below provide more specific responsibilities related to each position.

Emergency Response representative(s)
■ Actively participate in the facilities planning, implementation and reviewing of the sites Emergency response plan. ■ Ensure all staff members are aware of the procedures outlined in the ERP. ■ Setting up practical training schedules (drills) annually to ensure that all staff are prepared encase of an emergency. ■ Report any incidents that occur to senior management staff and/or the relevant authorities. ■ Appoint an Emergency Response (ER) team which includes an appropriate first aid representative and a fire warden. ■ Ensure that the appoint ER team undergo the correct training. ■ Appoint an appropriate Emergency coordinator.
First Aid representative(s)
■ Ensuring the first aid box is properly stocked to meet all foreseeable incidents which may occur. ■ Ensure that the boxes are properly safe guarded and that First Aiders name appears on the box. ■ Should any activity involve hazardous chemical substances, or any other specific first aid emergencies, this must be brought to the attention of the emergency coordinator. ■ Ensure the first aid certificate is current. ■ Ensure that there is always a first aider available at each shift.
Fire warden(s)

■ Ensure that the firefighting equipment is regularly serviced. ■ Attend the relevant firefighting training. ■ Report any unserviceable or damaged fire- fighting equipment to the ER.
Emergency Co-ordinator
■ Ensure that an update of the ERP is kept on file and is easily accessible in case of an emergency. ■ Ensure that all staff have been issued with the correct Personal Protective Equipment. ■ Ensure that a list of emergency telephone numbers, including those of the Emergency Response team, are visible to all staff at a number of locations around the facility. ■ In the case of an emergency, the emergency coordinator is responsible for undertaking roll call at the designated Assembly points.

8.6.2 EMERGENCY COMMUNICATIONS AND COORDINATION PLAN

In an emergency situation where there is an immediate threat to communities, personnel or the environment, the Project Manager will be notified immediately. The Project Manager will dispatch the Emergency Response Coordinator who will determine the appropriate plan of action depending on the severity of the emergency, the people affected, and the need to evacuate.

If there is a developing emergency or unusual situation, where an emergency is not imminent, but could occur if no action is taken, the Project Manager (or if the Project Manager is absent the Environmental Manager) is to be informed immediately. Once the emergency or unusual situation has been managed, the correct incident/near miss must be reported to the General Manager or through Eskom reporting processes.

If an emergency situation poses a direct threat to communities in the area, the Environmental Officer and/or Social Officer will advise persons in the vicinity of the emergency to evacuate due to the potential risk. The appropriate government authorities will immediately be notified of such an emergency evacuation. The Emergency Response Coordinator will be tasked with responding to the potential risk. Should the emergency situation be such that it can be managed by the Project Company, equipment and personnel will be deployed to the maximum extent necessary, so as to prevent/minimise potential risks.

8.6.3 RESPONSE TO INCIDENTS

An incident is any occurrence that has caused, or has the potential to cause, a negative impact on people, the environment or property (or a combination thereof). It also includes any significant departure from standard operating procedures. The reporting and investigation of all potential and actual incidents that could have a detrimental impact on human health, the natural environment or property is required so that remedial and preventive steps must be taken to reduce the potential or actual impacts because of all such incidents.

Any incident must immediately be reported to the relevant authorities and all the necessary documentation must be completed and submitted to the relevant authorities within the prescribed timeframes.

The actions resulting from any formal or informal investigations will be used to update the EMPr.

8.6.4 VERIFICATION

An environmental emergency response system will be developed for the execution of emergency drills that will include the following, inter alia:

- Fire Drills;
- Emergency Evacuation Drills; and
- Medical and Environmental Drills.

Reporting and monitoring requirements for the plan will include:

- Monthly inspections and audits;
- Quarterly reporting of accidents/ incidents;
- Reporting at the time of the incident and monthly spill reporting developed by the Environmental and Quality, Health and Safety departments;
- Bi-annual emergency response drills; and
- Annual reporting on training.

Emergency response drills and reporting will be maintained by the Project Manager and will provide information regarding required revisions to training or the emergency response actions. Each incident reported will be reviewed and investigated upon occurring. Actions will be identified where possible to improve the site's overall response to emergencies. Updates/revisions that are necessary to protect worker or community health and safety will be implemented immediately after approval by the General Manager.

This plan will be amended periodically in light of operational changes, learning experienced during its implementation and other activities that can affect the risk profiles.

8.6.5 POTENTIAL RISKS

The following emergency situations have been identified as potential threats at the proposed pipeline route:

- Fire and explosions
- Spills

It must be noted that there is a very minor risk associated with these risks as only a very small quantity of chemicals or hazardous substances are actually stored on site.

Fire	**Responsibility**
Raise the alarm	Employee who detected the fire
Switch of all automated systems within the facility	ER Team
Evacuate all personnel in the building	ER Team
Contact all relevant emergency services	Emergency Coordinator
Report to the emergency Assembly Point and await further instructions	All Staff
Remove all vehicles from the premises	ER Team and security
Undertake roll call and report all missing staff to the ER team	ER Coordinator
Evacuate remaining staff to a safe location outside the site boundaries	ER Team
Contain fire until Emergency services arrives	Fire warden
Provide First Aid, if required	First Aid representative
Spill	**Responsibility**
Contain the spillage using an onsite spill kit	Employee who discovered/caused the spill
Advice emergency services (if required)	Emergency coordinator
Provide First Aid (if required)	First Aid representative
Determine if there is any soil, groundwater or other environmental impact	Emergency coordinator
Ensure that all absorbents used from the spill kits are disposed of in the correct manner.	Emergency coordinator
Inform the DEA and DWS of any major spillages.	Emergency coordinator
Ensure that the incident is recorded in the incidents register.	Emergency coordinator

The following emergency centres were identified along with the corresponding emergency telephone numbers.

Emergency Centre	**Telephone Number**
Emergency Services	10177 (Ambulance / Fire Brigade)
Police Emergency Services	10111 014 762 1010
Ambulance Service	014 763 9111
Suicide Crisis Line	0800 12 13 14

8.7 CONCEPTUAL STORMWATER MANAGEMENT PLAN

The conceptual understanding of the site was developed and it involved the identification of potential clean areas and their isolation from potentially dirty areas. The main principles in this stormwater management plan (SWMP) include:

- Confine or divert any unpolluted water to a 'clean' water system, and polluted water to a 'dirty' water system;
- 'Clean' and 'dirty' water systems should be designed and constructed to prevent cross-contamination between the 'clean' and 'dirty' water systems; and
- Appropriate maintenance and management of storm water related infrastructure.

The proposed water systems or infrastructure will be designed to prevent any potential contamination of natural water resources identified in the area.

The existing water management system at Medupi includes:

- A dirty water management system to ensure that polluted water the power station and its associated infrastructure, as well as sediment-laden runoff from disturbed areas is separated from clean area runoff and that it is collected in Pollution Control Dams (PCD); and
- A clean water management system to divert water undisturbed by the power station's operations around the disturbed project footprint.

The majority of the pipeline is within the Medupi Power Station boundary and thus, any clean or dirty water generated during the construction period is diverted into the relevant system.

8.8 EROSION MANAGEMENT PLAN

Exposed and unprotected soils are the main cause of erosion in most situations. Therefore, this erosion management plan and the revegetation and rehabilitation plan are closely linked to one another and must not operate independently, but must rather be seen as complementary activities within the broader environmental management of the site and must therefore be managed together. This Erosion Management Plan addresses the management and mitigation of potential impacts relating to soil erosion, including:

- Material stockpiled for long periods (2 weeks) must be retained in a bermed area.
- Stockpiles not used in three (3) months after stripping must be seeded to prevent dust and erosion.
- Sensitive areas need to be identified prior to construction so that the necessary precautions must be implemented.
- Vegetation clearance must be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time.
- Areas to be cleared must be clearly demarcated and this footprint strictly maintained.
- Areas which are not to be constructed on within two months must not be cleared to reduce erosion risks.
- Silt fences and erosion control measures must be implemented in areas where these risks are more prevalent.
- Wind screening and stormwater control must be undertaken to prevent soil loss from the site.
- Other erosion control measures that must be implemented are as follows:
  - Brush packing with cleared vegetation;
  - Mulch or chip packing;
  - Planting of vegetation; and
  - Hydroseeding / hand sowing.
- All erosion control mechanisms need to be regularly maintained.
- Seeding of topsoil and subsoil stockpiles to prevent wind and water erosion of soil surfaces. Re-vegetation of disturbed surfaces must occur immediately after construction activities are completed. This must be done through seeding with indigenous grasses.
- No impediment to the natural water flow other than approved erosion control works is permitted.

To prevent stormwater damage, the increase in stormwater run-off resulting from construction activities must be

estimated and the drainage system assessed accordingly.

9 CONCLUSION

In terms of NEMA, everyone (i.e. all persons engaging in any component of this project) is required to take reasonable measures to ensure that they do not pollute the environment. 'Reasonable measures' includes informing and educating employees about the environmental risks associated with their work and training them to operate in an environmentally responsible manner.

Eskom also recognises that, in terms of NEMA, the cost to repair any environmental damage will be borne by the person responsible for the damage. If the above-mentioned environmental guidelines and mitigation measures are adopted, it is anticipated that the negative environmental impacts of the proposed construction of the raw water and make-up water pipeline will be mitigated. An Eskom appointed ECO can monitor the site periodically throughout construction to ensure that the required environmental controls are in place and working effectively, while the Medupi Power Station Environmental Manger monitors environmental controls during operation.

If you have any further enquiries, please feel free to contact:

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APPENDIX

A EAP CV

ASHLEA STRONG, MEM, EAP

Principal Consultant (Environmental Services), Environment & Energy

YEARS WITH THE FIRM

4

YEARS TOTAL

14

PROFESSIONAL QUALIFICATIONS

CEAPSA

AREAS OF PRACTICE

Auditing

Energy

Environmental Control

Health & Safety

Infrastructure

Mining

SEIR

Training

Waste Management

CAREER SUMMARY

Ashlea is a Principal Consultant with 14 years' experience in the environmental field. She currently provides technical and strategic expertise on a diverse range projects in the environmental management field, including environmental scoping and impact assessment studies, environmental management plans, waste and water management, as well as the provision of environmental management solutions and mitigation measures

Ashlea has been involved in the management of a number of large EIAs specifically within the energy sector such as the Medupi Power Station, and Pebble-Bed Modular Reactor (PBMR) and numerous Transmission Powerlines. She also has environmental auditing and training experience and expertise.

Ashlea holds a Masters in Environmental Management; a BTech (Nature Conservation), and a National Diploma (Nature Conservation); She is also a Certified Environmental Assessment Practitioner of South Africa (CEAPSA).

EDUCATION

Masters in Environmental Management, University of the Free State, South Africa	2006
B Tech, Nature Conservation, Technikon SA, South Africa	2001
National Diploma in Nature Conservation, Technikon SA, South Africa	1999

ADDITIONAL TRAINING

Conduct outcomes based assessment (NQF Level 5), South African Qualifications Authority (SAQA)	2009

PROFESSIONAL MEMBERSHIPS

Certified Environmental Assessment Practitioner of South Africa, with the Interim Certification Board (CEAPSA)	2010

PROFESSIONAL EXPERIENCE

Energy Sector

— Southern Energy Coal Fired Power Station (2016): Project Manager. This project involved the high-level review of the Environmental Impact Assessment for the Southern Energy Coal Fired Power Station near Hwange in Zimbabwe against relevant legislation and standards. Client: WSP | Parsons Brinckerhoff.

— Proposed Solar and Wind Projects located in the Northern and Western Cape Provinces (2015) Project Manager. This project involved the compilation of 15 Environmental Impact Assessments and Environmental Management Plans for 2 Solar and 2 Wind energy Projects near Aggenys and Sutherland respectively. Client: BioTherm Energy (Pty) Ltd.

— Proposed Solar Park, Northern Cape Province, South Africa (2012): Strategic Environmental Advisor. This project involved the provision of process expertise for the compilation of an Environmental Impact Assessment and Environmental Management Plan for the proposed Solar Park in the Northern Cape Province. Client: Central Energy Fund (CEF).

- Proposed Tabor - Nzhelele 400kV Transmission Lines and associated infrastructure, Limpopo Province, South Africa (2012): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for a 100km 400kV powerline between Louis Trichardt and Musina in the Limpopo Province. Client: Eskom Transmission.
- Retrofitting of the existing Electrostatic Precipitators with Fabric Filter Plants at Units 2, 3 and 4 at the Grootvlei Power Station, South Africa (2012): Project Manager. This project involved the compilation of a Basic Assessment Report and Environmental Management Plan for the proposed retrofitting of the existing Electrostatic Precepitators with Fabric Filter Plants at the Grootvlei Power Station. Client: Eskom Holdings SOC Limited.
- Proposed Mulilo Coal Fired Power Station and associated infrastructure as well as associated power lines and substations, Musina, Limpopo, South Africa (2008): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for the proposed Mulilo Coal Fired Power Station and associated infrastructure as well as associated power lines and substations in the Musina area of the Limpopo Province. Client: Parsons Brinkerhoff Africa and Mulilo Power.
- Pebble Bed Modular Reactor Demonstration Plant and Associated Infrastructure, Western Cape, South Africa (2008): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for the proposed Pebble Bed Modular Reactor Demonstration Plant and Associated Infrastructure in the Western Cape Province. Client: Eskom Generation.
- Proposed Bantamsklip – Kappa 765 kV Transmission Lines and associated infrastructure, Western and Northern Cape, South Africa (2008): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for four 260km 765kV powerlines between the Bantamsklip Nuclear Power Station Site and the proposed new Kappa Substation in the Karoo, Western Cape Province. Client: Eskom Transmissions.
- Proposed Bantamsklip – Bacchus, Bacchus - Kappa and Bacchus – Muldersvlei 400 kV Transmission Lines and associated infrastructure, Western and Northern Cape, South Africa (2008): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for a number of 400kV powerlines between the Bantamsklip Nuclear Power Station Site and a number of substations, including Bacchus, Kappa and Muldersvlei, in the Western Cape Province. Client: Eskom Transmission.
- Westgate – Tarlton – Kromdraai 132 kV Sub-Transmission line and associated infrastructure, Gauteng, South Africa (2008): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for the Westgate – Tarlton – Kromdraai 132 kV Sub-Transmission line and associated infrastructure in the Gauteng Province. Client: Eskom Distribution – Central region.
- Environmental Scoping Study for the proposed new distribution line and substation for Eskom, Dundonald, Mpumalanga (also involved in the Public Participation Process), Mpumalanaga, South Africa (2008): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for a 132kV powerline as well as a new substation in the Tarlton area of Gauteng.
- The proposed new 132 kV sub-transmission line between the Dinaledi and GaRankuwa substations for Eskom, GaRankuwa, North West, South Africa (2008): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for a

132kV powerline between the Dinaledi and GaRankuwa substations in the GaRankuwa area of the North West Province. Client: Eskom Distribution.

- Expansion of the Transmission powerline network and associated infrastructure between the Perseus substation and the Beta substation, Free State, South Africa (2008): Project Manager. This project involved the compilation of an alignment specific construction Environmental Management Plan for the 13km 765kV Perseus Beta Turn-ins. Eskom Transmission
- Tarlton – Kromdraai 132 kV Sub-Transmission line and associated infrastructure, Gauteng, South Africa (2008): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for a 132kV powerline as well as a new substation in the Tarlton area of Gauteng. Client: Eskom Distribution – Central Region.
- Basic Assessment for the proposed Watershed – Mmabatho 88kV Power line. North West, South Africa (2008): Project Manager. This project involved the compilation of a Basic Assessment and Environmental Management Plan for a new 88kV powerline near Mmabatho in the North West Province. Client: Eskom Distribution – Central Region.
- Proposed Watershed – Mmabatho 88kV Power line. North West, South Africa (2007): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for the Watershed – Mmabatho 88kV Power line in the North West Province. Client: Eskom Distribution – Central Region.
- Proposed Combined Cycle Gas Turbine Plant and Associated Infrastructure near Majuba, Mpumalanga, South Africa (2007): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for the proposed Combined Cycle Gas Turbine Plant and Associated Infrastructure near Majuba in the Mpumalanga Province. Client: Eskom Holdings SOC Limited.
- Proposed Capacity Increase of the Atlantis OCGT Plant and Associated Infrastructure, Western Cape, South Africa (2006): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for the proposed Capacity Increase of the Atlantis OCGT Plant and Associated Infrastructure in the Western Cape Province. Client: Eskom Generation.
- Proposed Concentrated Solar Thermal Plant in the Northern Cape, South Africa (2006): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for the proposed Concentrated Solar Thermal Plant near Upington in the Northern Cape Province. Client: Eskom Holdings SOC Limited.
- Proposed Underground Coal Gasification plant, Eskom, Mpumalanga, South Africa (2006): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for the proposed Underground Coal Gasification plant near the Majuba Power Station in the Mpumalanga Province. Client: Eskom Holdings SOC Limited.
- Proposed new Coal-fired Power Station in the Lephalale Area for Eskom, Limpopo, South Africa (2005): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for the proposed new Coal-fired Power Station in the Lephalale Area in the Limpopo Province. Client: Eskom Generation.
- Proposed Open Cycle. Gas Turbine Power Station at Atlantis for Eskom, Western Cape, South Africa (2005): Environmental Consultant. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for the proposed Open Cycle. Gas Turbine

Power Station at Atlantis in the Western Cape Province. Client: Eskom Generation.

Infrastructure Sector

- Rehabilitation of the R34 between Vryburg and Schweizer-Reneke, North West, South Africa (2016): Project Manager. This project involved the compilation of a Basic Assessment and Environmental Management Plan for the upgrading of the R34 between Vryburg and Schweizer-Reneke. Client: SANRAL
- Proposed Expansion of the Cremation Facilities at the Envirocin Pet Crematorium, Gauteng, South Africa (2013): Project Manager. This project involves the compilation of a basic assessment for the expansion of the cremation facilities at the Evnirocin Pet Crematorium in Kyasands, Gauteng Province. Client: Envirocin Incineration Systems CC.
- Proposed Kraft Paper Mill in Frankfort, Frankfort, Free State, South Africa (2013): Project Manager. This project involved the undertaking of an Environmental Impact Assessment, including the compilation of an Environmental Management Programme, for the proposed establishment of a KRAFT paper mill in Frankfort in the Free State Province. Client: Industrial Development Corporation of SA (Pty) Ltd.
- Rehabilitation of the N14 between Delerayville and Sannieshof, North West, South Africa (2011): Project Manager. This project involved the compilation of a Basic Assessment and Environmental Management Plan for the upgrading of the N14 between Sannieshof and Delerayville as well as the construction of a new bridge over the Hartsriver. This project also included the compilation of Water Use License and Mining Permit Applications. Client: SANRAL.
- Proposed new Waterfall Cemetery, Limpopo, South Africa (2011): Project Manager. This project involved the compilation of a Basic Assessment and Environmental Management Plan for the new Waterfall Cemetery, Limpopo Province. Client: Makhado Municipality.
- Route determination of the proposed Metro Boulevard, Gauteng, South Africa (2008): Project Manager. This project involved the undertaking of an Environmental Impact Assessment for the route determination of the proposed Metro Boulevard in the Weltevreden Park Area of the Gauteng Province. Client: Johannesburg Roads Agency.
- Proposed new fuel supply pipeline between Milnerton and Atlantis, Western Cape, South Africa (2007): Project Manager. This project involved undertaking an Environmental Impact Assessment for the proposed new fuel supply pipeline between Milnerton and Atlantis to supply the Ankerlig Power Station in the Western Cape Province. Client: Eskom Generation.

Mining Sector

- Establishment of the Proposed Rietvlei Opencast Coal Mine, Mpumalanga, South Africa (2013): Project Manager. This project involves the undertaking of an integrated environmental authorisation process, including an Environmental Impact Assessment, Environmental Management Programme Report, Waste Management License Application and Water Use License Application, for the establishment of an opencast coal mine north of Middelburg. Client: Rietvlei Mining Company.
- Decommissioning of Redundant Infrastructure at the Vaal River Operations, North West and Free State, South Africa (2013): Project Manager. This project involves undertaking an integrated Environmental Authorisation and Waste Management License process for the proposed decommissioning of redundant infrastructure at AngloGold Ashanti's Vaal River Operations. Client: AngloGold Ashanti.

- Decommissioning of Redundant Infrastructure at the West Wits Operations, Gauteng, South Africa (2013): Project Manager. This project involves undertaking a Basic Assessment process for the proposed decommissioning of redundant infrastructure at AngloGold Ashanti's West Wits Operations. Client: AngloGold Ashanti (Pty) Ltd.
- Inyanda Mine Pegasus South Expansion, Mpumalanga, South Africa (2011): Project Manager. This project included the compilation of an Environmental Impact Assessment, Environmental Management Plan, the Amendment of the existing Environmental Management Programme Report and the amendment of the existing Water Use License for the Inyanda Mine Pegasus South Expansion project, north of Middelburg in the Mpumalanga Province. Client: Exxaro Coal (Pty) Ltd.
- Sishen Infrastructure Program, Northern Cape, South Africa (2010): Project Manager. This project involved the compilation of an Environmental Impact Assessment and an Environmental Management Plan for the infrastructure expansion programme proposed by the Sishen Mine in the Northern Cape. Client: Sishen Iron Ore (Pty) Ltd.
- Prospecting Permit Applications in the Kuruman area of the Northern Cape, South Africa (2011): Project Manager. This project involved the compilation of Environmental Management plans as part of six applications for Prospecting Permits in the Kuruman area of the Northern Cape. Client: Sound Mining Solutions.
- Borrow pits required by the Limpopo Department of Roads and Transport, Limpopo, South Africa (2010): Project Manager. This project involved the compilation of Environmental Management plans as part of the applications for Mining Permits for borrow pits required for the rehabilitation of provincial roads in the Limpopo Province. Client: Limpopo Department of Roads and Transport.
- Borrow pits required for the Medupi Coal Fired Power Station, Limpopo, South Africa (2008): Project Manager. This project involved the compilation of Environmental Management plans as part of the applications for Mining Permits for borrow pits required for the Medupi Coal Fired Power Station in the Limpopo Province. Client: Eskom Generation.
- Borrow pits required for the Ingula Pumped Storage Scheme, KwaZulu-Natal, South Africa (2008): Project Manager. This project involved the compilation of Environmental Management plans as part of the applications for Mining Permits for borrow pits required for the Ingula Pumped Storage Scheme in the Kwa-Zulu Natal Province. Client: Eskom Generation.
- Project Manager, Mining Right Application for a 23 Hectare Borrow Pit required for the Steelpoort Pumped Storage Scheme, Mpumalanga, South Africa (2007): Project Manager. This project entailed the compilation of the required Environmental Management Programme Report in support of a Mining Right Application for a 23 Hectare Borrow Pit required for the Steelpoort Pumped Storage Scheme in the Mpumalanga Province. Client: Eskom Generation.
- Renewed Mining and Prospecting Activities on the farm Quaggaskop 215, Vanrhynsdorp, Western Cape, South Africa (2004): Environmental Consultant. This project involved the compilation of an Environmental Management Programme Report for the recommencement of mining and prospecting activities on the farm Quaggaskop 215 outside Vanrhynsdorp in Western Cape Province. Client: Minexpo.

Waste Management Projects

- Proposed continuous Ashing at Majuba Power Station, Mpumalanga, South Africa (2012): Project Manager. This project entailed the compilation

Environmental Impact Assessment and Waste Management License Application for the proposed continuous ashing project at the Majuba Power Station in Mpumalanga. Client: Eskom Holdings SOC Limited.

- Proposed continuous Ashing at Tutuka Power Station, Mpumalanga, South Africa (2012): Project Manager. This project entailed the compilation Environmental Impact Assessment and Waste Management License Application for the proposed continuous ashing project at the Tutuka Power Station in Mpumalanga. Client: Eskom Holdings SOC Limited.
- Proposed extension of Ash Dams at Hendrina Power Station, Mpumalanga, South Africa (2011): Project Manager. This project entailed the compilation Environmental Impact Assessment and Waste Management License Application for the proposed extension of the ash dams at the Hendrina Power Station in Mpumalanga. Client: Hendrina Power Station.
- Phase 1 of the Environmental Impact Assessment for the Proposed Regional General and Hazardous Waste Processing Facility, Eastern Cape (2005). Project Manager. This project entailed the compilation Environmental Impact Assessment for the Proposed Regional General and Hazardous Waste Processing Facility in the Eastern Cape. Client: Coega Development Corporation.

Specialist Projects

- Strategic Environmental Assessment for the Development. Master Plan Greater Port Harcourt, Rivers State, Nigeria, Africa (2008): Senior Environmental Consultant. This project entailed the compilation of a Strategic Environmental Assessment for the City of Port Harcourt as part of the development of the Master Plan for the Greater Port Harcourt Area. Client: Port Harcourt Government
- Development of an Environmental Policy, Gauteng, South Africa (2006): Environmental Consultant. This project entailed the development and compilation of an environmental policy for the Ekurhuleni Metropolitan Municipality. Client: Ekurhuleni Metropolitan Municipality.
- Environmental Input into the National Transport Master Plan, South Africa (2007): Environmental Consultant. This project included the provision of strategic environmental input in to the Draft National Transport Plan. Client: Department of Transport.
- Development of the Development Corridors, Ekurhuleni, Gauteng, South Africa (2006): Environmental Consultant. This project included the provision of strategic environmental input in to the Ekurhuleni Metropolitan Municipalities Development Corridor Study. Client: Ekurhuleni Metropolitan Municipality.

Auditing

- Compliance Audit for the Bokpoort Concentrating Solar Power (CSP) Facility, Groblershoop, Northern Cape, South Africa (2016): Lead Auditor. This project involved the environmental compliance auditing of the Waste Management License, Environmental Authorisation and Water Use License for the Bokpoort CSP Facility near Groblershoop in the Northern Cape Province. Client: ACWA Power Solafrica Bokpoort CSP Power Plant (Pty) Ltd.
- Compliance Audit for the Waste Recycling Facility and Redundant Materials Management Yard, Secunda, Mpumalanga, South Africa (2016): Lead Auditor. This project involved the environmental compliance auditing of the Waste Management license and other relevant permits for Waste Recycling Facility and Redundant Materials Management Yard in Secunda in Mpumalanga Province. Client: Sasol Chemical Industries: Secunda Synfuels Operations.

- InvestChem Annual Environmental Compliance Monitoring, Kempton Park, Gauteng, South Africa (2013 - 2016): Lead Auditor. This project involved the annual environmental compliance auditing for InvestChem's Sulphonation Plant in Kempton Park, Gauteng Province. The monitoring included InvestChem's compliance to various commitments contained in their environmental management programmes and conditions within their environmental authorisations (records of decision). Client: Investchem (Pty) Ltd.
- Waste Management License Audit for the Sasol Waste Ash Site, Secunda, Mpumalanga, South Africa (2014 - 2016): Lead Auditor. This project involved the annual environmental compliance auditing of the Waste Management license for Sasol's Waste Ash Site in Secunda in Mpumalanga Province. Client: Sasol Chemical Industries: Secunda Synfuels Operations.
- EMPR Performance Assessment Report for the Landau Colliery, Mpumalanga, South Africa (2013): Auditor. This project involved the formal assessment and verification of the Landau Colliery Environmental Management Programme Report, conducted in accordance with Regulation 55 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002). Client: Anglo Thermal Coal.
- Waste Management License Audit for the Slagment Operation, Vanderbijlpark, Gauteng, South Africa (2013): Lead Auditor. This project involved the annual environmental compliance auditing for AfriSam's Slagment Operation in Vanderbijlpark in Gauteng Province. The audit included AfriSam's compliance to the conditions of their waste management license. Client: AfriSam Southern Africa (Pty) Ltd.
- EMPR Performance Assessment Report for the New Vaal Colliery, Free State, South Africa (2006-2007): Auditor. This project involved the formal assessment and verification of the New Vaal Colliery Environmental Management Programme Report, conducted in accordance with Regulation 55 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002). Client: Anglo American Thermal Coal.

Environmental Control Projects

- N14 rehabilitation between Sannieshof and Delareyville, North West, South Africa (2012): Environmental Control Officer. This project involved the monthly auditing of the contractor's compliance with the conditions of the approved Environmental Management Plan as well as ad hoc environmental advise to the Project Engineer and SANRAL. Client: SANRAL.
- Delmas and Bontleng Waste Water Treatment Works, Mpumalanga, South Africa (2009): Environmental Control Officer. This project involved a once off compliance audit of the above-mentioned Waste Water Treatment Works. Client: Victor Khanye Municipality.
- Nkonjaneni Water Borne Sewer Project in Piet Retief, Mpumalanga, South Africa (2009): Environmental Control Officer. This project involved the monthly auditing of the contractor's compliance with the conditions of the approved Environmental Management Plan as well as ad hoc environmental advise to the Project Engineer. Client: Mkhondo Local Municipality.
- Upgrading of the Waterval Water Care Works, Gauteng, South Africa (2005-2007): Environmental Control Officer. This project involved the monthly auditing of the contractor's compliance with the conditions of the approved Environmental Management Plan. Client: ERWAT.
- Lotus Gardens Ext 2 Township establishment, Gauteng, South Africa (2003): Environmental Control Officer. This project involved the monthly auditing of the contractor's compliance with the conditions of the approved Environmental Management Plan. Client: City of Tshwane.

Training

- N14 rehabilitation between Sannieshof and Delareyville, North West, South Africa (2012): Project Manager. This project involved the provision of training for the staff of the N14 rehabilitation project with regards to the contents of the environmental management plan. Client: SANRAL.
- Training in Environmental Aspects and Rehabilitation for the Small Scale Mining Division of Mintek, City, Province, South Africa (2004): Trainer. This project involved the provision of environmental awareness training for delegates involved in the small scale miner training programme run by the Mintek small scale mining division. Client: Mintek
- Training in Environmental Aspects and Impacts, Germiston, Gauteng, South Africa (2004): Trainer. This project involved the provision of environmental aspects and impacts training for the staff of Transwerk in Germiston. Client: Transwerk Germiston.

Health & Safety Projects

- Payneville water and sewer reticulation project, Gauteng, South Africa (2012): Health and Safety Officer. This project involved the monthly health and safety auditing of the Payneville water and sewer reticulation project in Springs. Client: Ekurhuleni Metropolitan Municipality.
- Nkonjaneni Water Borne Sewer Project in Piet Retief, Mpumalanga, South Africa (2009): Health and Safety Officer. This project involved the monthly health and safety auditing of the Nkonjaneni water borne sewer project in Piet Retief. Client: Mkhondo Local Municipality.

CHIFADZA TUTAYI, B.Sc.H

Environmental Consultant (Environmental Management), Environment & Energy

YEARS WITH THE FIRM

1>

YEARS TOTAL

3.5

AREAS OF PRACTICE

Environmental Management

CAREER SUMMARY

Tutayi Chifadza is an Assistant Environmental Consultant for WSP at the Johannesburg, Bryanston office in the Environmental Services division. He moved to WSP from Sparrow Consulting almost a year ago where he was Project Manager for their Technical Manual/Training material development team.

He is currently teaming up with Senior Consultants on Water Use License applications, BA and audits for Transnet on their pipeline infrastructure as well as the BA process for Sasol Energy Technology. He conducted Water Use License audits for four sections at South 32 and its reporting. He was also responsible for conducting a Waste Management Licence audit and its reporting for the Sappi solid waste disposal facility in Springs, Gauteng.

Tutayi has been previously involved in the technical area of production industries with regards to their processes and instrumentation for the purpose of creating technical training manuals and SOPs. He is currently part of the Employment Equity Committee at WSP and recently completed an online training course in Project Management Professional.

EDUCATION

Bachelor of Science (Honours), Applied Science in Environmental Technology, University of Pretoria, Pretoria, South Africa	2013
Bachelor of Science, Chemistry, University of Pretoria, Pretoria, South Africa	2012

ADDITIONAL TRAINING

Certificate of Completion for Project Management Professional (PMBOK), e-careers (Online learning)	2016

PROFESSIONAL EXPERIENCE

Environmental Services

- Knightsbridge Development EMP ECO, Johannesburg, Gauteng, South Africa (2016): Tutayi's role was to conduct the ECO audit against the EMP created for Greenstar requirements. Client: Emira Property.
- PPC Waste Classification, All PPC South Africa sites, South Africa (2016): Tutayi's role was to consolidate the waste inventories from different sites into one waste inventory, pre-classify the waste, collect samples, conduct waste profiling, waste classification and create SDSs based on laboratory analysis of samples collected. He also created generic SDSs for waste were sampling was not required. Client: PPC Ltd.
- FFS Construction of a Filtration Plant at the FFS Evander Facility, Evander, Mpumalanga, South Africa (2016): Tutayi's role was to conduct the audit of the relevant license conditions during the construction phase of the filtration plant and. He also conducted the close-out audit for the construction phase. The project is about monitoring and auditing the state of the site during the construction of the filtration plant. Client: FFS Refiners (Pty) Ltd.
- Total SA WMP, Johannesburg, Gauteng, South Africa (2016): Tutayi's role is to create a waste database, rating waste, SDSs and devising best management plans for each type of waste at Total entities. The project involves creating a waste management plan for all forms of waste at Total entities. This includes

depots, offices, commercial installations, service stations, ISPs and LMPs. Client: Total SA.

- South 32 EMPR PAR, WUL and WML audits, Middelburg, Mpumalanga, South Africa (2016): Tutayi's role was to conduct WUL audits for the Klipfontein, MMS North and South, Douglas and BMK Extension coal mining sections as well as write up the relevant reports. The project is about conducting performance assessment reports (EMPR), as well as WUL and WML auditing. Client: Middleburg Mine Services (South 32).
- Impala Plat Landfill Audit, Rustenberg, North West, South Africa (2016): Tutayi's role was to take gas concentration readings from probes strategically placed on the landfill using the Geotech instrument. Methane, oxygen, carbon dioxide and nitrogen gas concentrations were focused on. The project is about auditing the landfill and monitor the gas concentrations to make sure that there is no significant methane build-up within the landfill. Client: Impala Platinum Limited.
- Butsanani EIA-EMPR, Middelburg, Mpumalanga, South Africa (2016): Tutayi's role was to help the senior consultant in compiling, collecting and researching data for the purpose of filling in the WUL application forms. The project is about helping the client acquire the WUL in order to start mining activities. Client: Rietvlei Mining Company (Pty) Ltd.
- Samancor Manganese South Plant demolition, Meyerton, Gauteng, South Africa (2016): Tutayi's role was to provide ECO services for the demolition of the South Plant site on the premises. This entailed conducting environmental audits to ensure EMP compliance for the project to minimise impacts and risk during the activities. Client: Samancor Manganese, Metalloys, operated by South 32.
- Sappi External Waste Management Licence Compliance Audit, Springs, Gauteng, South Africa (2016): Tutayi was responsible for conducting the WML environmental compliance audit of the solid waste disposal facility situated at Enstra and compile an audit report according to the requirements of the National Environmental Management Waste Act (No. 59 of 2008) (NEMWA). Client: Sappi Southern Africa Limited.
- General Electric Healthcare Environmental Health and Safety Audit, Rosebank, Gauteng, South Africa (2016): Tutayi was responsible for undertaking an Environmental Health and Safety (EHS) inspection of the GE Healthcare operations in Rosebank and one field site. The field site was at the Life Carstenhof Hospital were the Field Engineers were installing a new piece of equipment. Client: GE Healthcare, a Division of General Electric.
- Rose Foundation Environmental Compliance Audit of Old Oil Man, Chamdor, Gauteng, South Africa (2016): Tutayi was responsible for undertaking an environmental compliance audit to identify and assess key environmental issues pertaining to the operations and facilities against which on-going continuous improvements and modifications of the facility can be evaluated. The audit covered site operational control measures, legal and regulatory compliance, impacts to environment and general environmental practice. Client: Rose Foundation.
- Samancor Chrome Turfontein Underground Mine Project Mooinoi, North West, South Africa (2016): Tutayi assisted in facilitating the public participation process during the public meeting conducted to provide insight into the potential impacts and benefits from the proposed underground mine project. Client: Samancor Chrome.
- Sasol Oil Pretoria West Depot Environmental Authorisation Compliance Audit, Pretoria West, Gauteng, South Africa (2016): Tutayi was responsible for conducting a technical compliance audit of the Exemption Record of Decision

(ROD) and an Amended Environmental Authorisation (EA) and compile an audit report according to the requirements of the National Environmental Management Act (No. 107 of 1998) as amended (NEMA), and as part of the conditions of the EA. Client: Sasol Oil (Pty) Ltd.

- BioTherm Wind and Solar Energy Facilities, Western Cape and Northern Cape, South Africa (2017-2017): Tutayi assisted in the creation of a consolidated impact assessment rating based on the available specialist studies as well as consolidating the comments and response from commenting authorities and stakeholders. Client: BioTherm Energy.
- Sasol Energy Technology Blending Facility Upgrade Project, Sasolburg, Free State, South Africa (2016-2017): Tutayi is part of a two-man team responsible for the EIA process for the replacement of old USTs with new ones on the Sasol One site. Client: Sasol Energy Technology, a Division of Sasol Oil (Pty) Ltd.
- Anglo Platinum Water Separation Project, Rustenburg, North West, Gauteng (2016-2-17): Tutayi is assisting in the BA process for the proposed refurbishment of an existing pipeline and installation of new pipelines as well in the Water Infrastructure Separation Project. Client: Anglo American Platinum Limited.
- South 32 Middelburg Water Reclamation Plant (MWRP), Middelburg, Mpumalanga, South Africa (2017): Tutayi is part of the team conducting sampling and classification of Stage 1 and Stage 2 gypsum produced as the by-product of the process as well as conducting the fertiliser assessment potential of the by-products. Client: South 32 Limited.
- J.P Morgan Chase & Company, 1 Fricker Road EMP ECO, Illovo, Gauteng, South Africa (2017): Tutayi compiled the EMP for the proposed refurbishment of the office building to attain a Green Star rating and is also responsible for conducting the first EMP compliance audit and training of the DEO to carry out subsequent audits. Client: J.P Morgan Chase & Company.
- Transnet Pipelines EIA/BA process ECO, Phola & Secunda, Mpumalanga, South Africa (2017): Tutayi is responsible for undertaking the BA and EIA process, WUL applications and ECO activities in the Mpumalanga region on an as and when required basis for the existing and potential new pipeline infrastructure. Client: Transnet Pipelines, a Division of Transnet Limited.

APPENDIX

B

EAP DECLARATION OF INTEREST AND UNDERTAKING

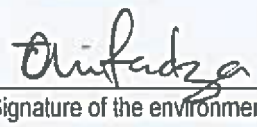
APPENDIX 9
9.1 DECLARATION OF THE EAP

I, **Tutayi Chifadza**, declare that –

- I act as the independent environmental assessment practitioner in this application;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I will take into account, to the extent possible, the matters listed in Regulation 18 of the Regulations when preparing the application and any report relating to the application;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority, unless access to that information is protected by law, in which case it will be indicated that such information exists and will be provided to the competent authority;
- I will perform all obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I am aware of what constitutes an offence in terms of Regulation 48 and that a person convicted of an offence in terms of Regulation 48(1) is liable to the penalties as contemplated in section 49B of the Act.

Disclosure of Vested Interest (delete whichever is not applicable)

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;



Signature of the environmental assessment practitioner

WSP Environmental (Pty) Ltd

Name of company:

08/05/2019

Date

PROPOSED CONSTRUCTION OF MAKE-UP AND RAW WATER SUPPLY PIPELINE AT THE MEDUPI COAL FIRED POWER STATION

APPENDIX 9
9.2 UNDERTAKING UNDER OATH/ AFFIRMATION

I, **Tutayi Chifadza**, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Chifadza

Signature of the environmental assessment practitioner

WSP Environmental (Pty) Ltd

Name of company

08/05/2019

Date

COMMISSIONER OF OATHS (RSA)
CRAIG HARRIS ACMA CGMA
CIMA Membership No: 1-TD1BH
Building C, Knightsbridge
33 Sloane Street, Bryanston, 2191
South Africa

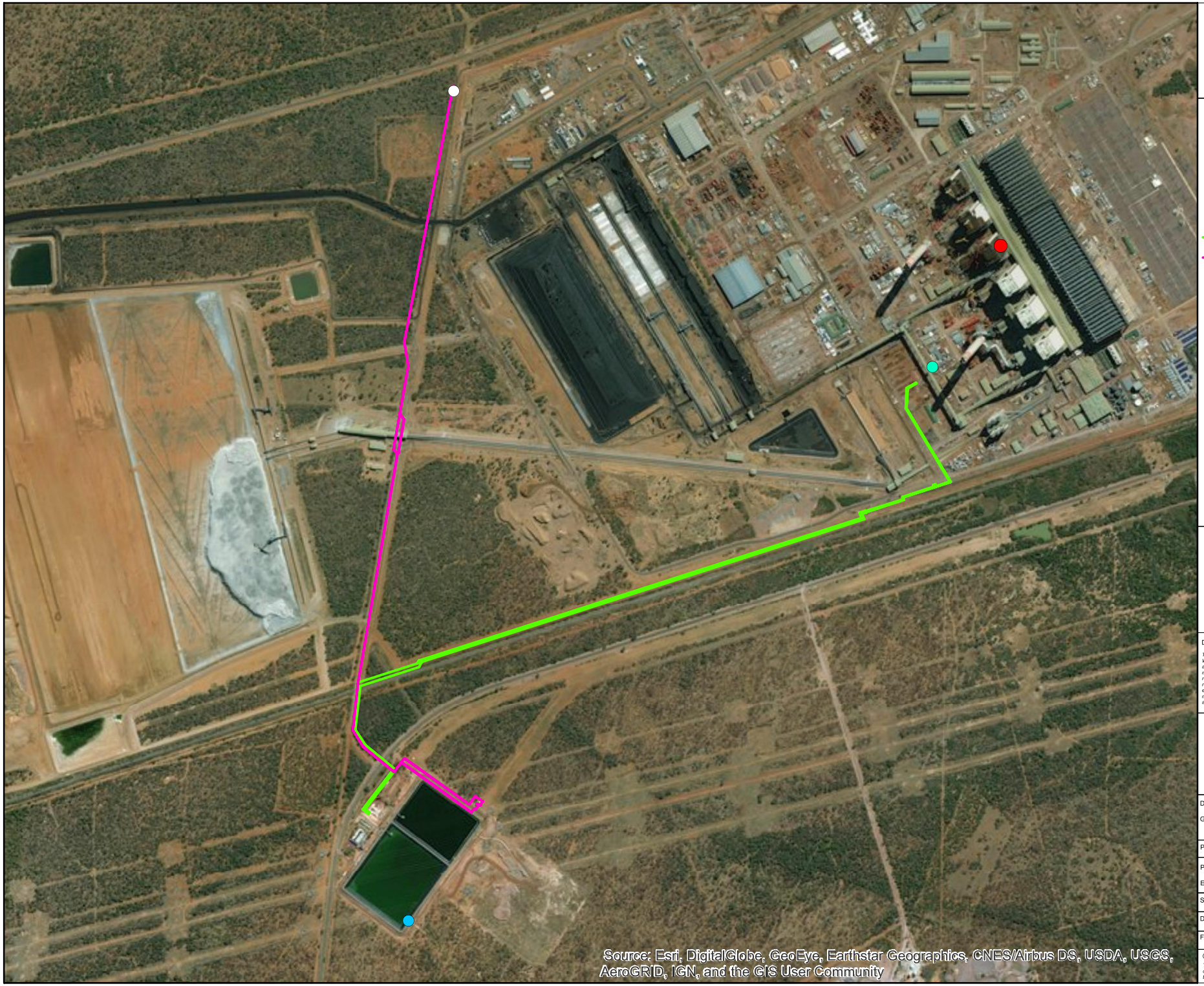
Signature of the commissioner of oaths

08/05/2019.

Date

APPENDIX

C LAYOUT MAP



ESKOM

SITE LAYOUT

Legend

- FGD System
- Offtake Point
- Eskom Water Reservoirs
- Medupi Power Station
- Make-up Water Supply
- Raw Water Pipeline

N

0 130 260 390 520

Metres

DISCLAIMER

The information on this figure was derived from various digital databases available to WSP Environmental (Pty) Ltd. All information is provided "as is" and it must be acknowledged that data, information, and maps are dynamic and in a constant state of maintenance, correction and update. WSP Environmental (Pty) Ltd cannot accept any responsibility for errors, omissions, or positional accuracy where it has not been directly responsible for the production of the data referenced. There are no warranties, expressed or implied, as to the use of this information, including the warranty of merchantability or fitness for a particular purpose. Notification of any errors will be appreciated.

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DATA SOURCE:

GARMIN STREETS

PROJECTION: GCS_WGS_1984

PROJECT TITLE:

ESKOM RAW WATER PIPELINE BA & WULA

SCALE: 1:15,000	DRAWN BY: SINENHLANHLA RADEBE
DATE: 2019/04/24	REVIEWED BY: TUTAYI CHIFADZA

FIGURE NO: 2	PROJECT NO: 41101556	REV: