

APPENDIX G: ENVIRONMENTAL MANAGEMENT PROGRAMME

PELLA BULK WATER PIPELINE ENVIRONMENTAL MANAGEMENT PROGRAMME

Pella Bulk Water Pipeline
Prepared for: Black Mountain Mining (Pty) Ltd



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ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	Definition
BA	Basic Assessment
BAR	Basic Assessment Report
BBBEE	Broad Based Black Economic Empowerment
BMM	Black Mountain Mine
CEMPr	Construction Environmental Management Programme
CEP	Community Engagement Plan
DAFF	Department Agriculture, Fisheries and Forestry
DN	Diameter Nominal
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioners
EAPASA	Environmental Assessment Practitioners Association of South Africa
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EO	Environmental Officer
EPRP	Emergency Preparedness and Response Plan
ESO	Environmental Site Manager
EPRP	Emergency Preparedness and Response Plan
GA	General Authorisation
HIV	Human Immunodeficiency Virus
I&APs	Interested and Affected Parties
IAIAAsa	International Association for Impact Assessment
IEA	Independent Environmental Auditor
km	Kilometre
KV	Kilo Volt
LED	Light Emitting Diode
ML	Mega Litre
MR	Mining Right

Acronym / Abbreviation	Definition
MRA	Mining Right Area
MS	MSs
MSDS	Material Safety Data Sheets
MTPA	Million Tons per Annum
MVA	Mega Volt Ampere
NCDENC	Northern Cape Department of Environment and Nature Conservation
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:BA	National Environmental Management Biodiversity Act, 2004 (Act No 10 of 2004)
NEM: WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NFA	National Forest Act, 1998 (Act No. 84 of 1998)
NGO	Non-governmental organisation
NCNCA	Northern Cape Nature Conservation Act, 2009 (Act No. 9 of 2009)
OEMPr	Operational Environmental Management Programme
OHS Act	Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)
PPE	Personal Protective Equipment
RE	Resident Engineer
SAHRA	South African Heritage Resources Agency
SCC	Species of Conservation Concern
SLR	SLR Consulting South Africa (Pty) Ltd
TMP	Traffic Management Plan
UV	Ultraviolet
WMP	Waste Management Plan
WTP	Water Treatment Plant
WUL	Water Use Licence

1. INTRODUCTION

1.1 BACKGROUND

Black Mountain Mining (Pty) Ltd owns and operates the Gamsberg Zinc Mine. The mining activities commenced in June 2016 when overburden stripping for the open pit commenced. The construction of the concentrator plant commenced in 2017 with the official opening in February 2019. Phase 2 will expand the mining capacity to 10 million tonnes per annum (mtpa) via the open pit. Water for the operations is currently sourced from the Orange River through an intake pump house located at Pella Drift, almost 30 km to the north east of the Gamsberg Zinc Mine. The current water demand, with the Black Mountain Mine (BMM) operation and Phase 1 concentrator plant at Gamsberg, is 28 ML/day, the existing intake water pumping system has been designed for 40.8 ML/day.

In order to ensure that the pipeline capacity will meet the future water demand and allow for the complete utilization of the currently licensed abstraction volume of 44 ML/day Black Mountain Mining (Pty) Ltd, in conjunction with Sedibeng Water, is proposing to replace and upgrade the existing old underground pipeline and associated infrastructure. This replacement pipeline will be located within the existing pipeline servitude and would supply water to the proposed Gamsberg Smelter Project and existing Gamsberg Zinc Mine, BMM and the surrounding towns (including Aggeneys, Pella, Pofadder and local landowners).

Black Mountain Mining (Pty) Ltd will construct the Pella Bulk Water Pipeline with Sedibeng Water being the overall owner and operator.

SLR Consulting South Africa (Pty) Ltd (SLR) has been appointed to undertake the Basic Assessment (BA) process for the proposed water infrastructure upgrades.

1.2 PROJECT DESCRIPTION

1.2.1 Applicant details

The applicant for the project is Sedibeng Water. Details are provided in [Table 1-1](#) below.

Table 1-1: Applicant details

Name	Sedibeng Water
Address	Protea Street
	Balkfontein
	Bothaville
	Free State
	9660
Responsible person	Obby Masia
Tel	056 515 0200

1.2.2 Project locality

The project is located between the towns of Aggeneys and Pella in the Khâi-Ma Local Municipality in the Northern Cape Province (Figure 1). The project start, mid and end points are provided in [Table 1-2](#). The full alignment is included in

Figure 5.

Table 1-2: Project Location (Start, Mid, end Points)

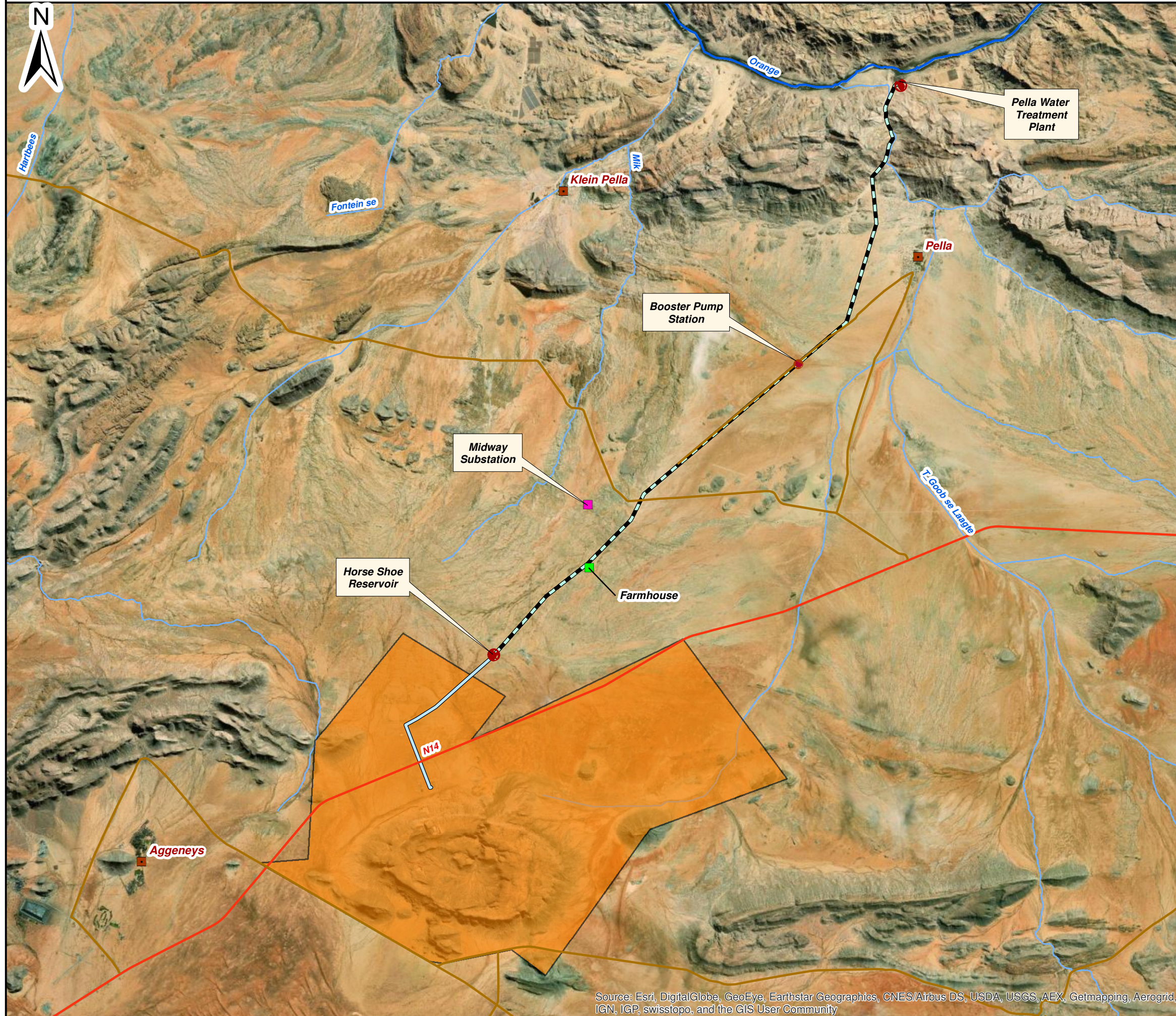
	Latitude	Longitude
Start	28°57'50.57"S	19°09'18.07"E
Mid	29°04'27.86"S	19°05'55.26"E
End	29°10'18.32"S	18°59'01.87"E

1.2.3 Affected Properties

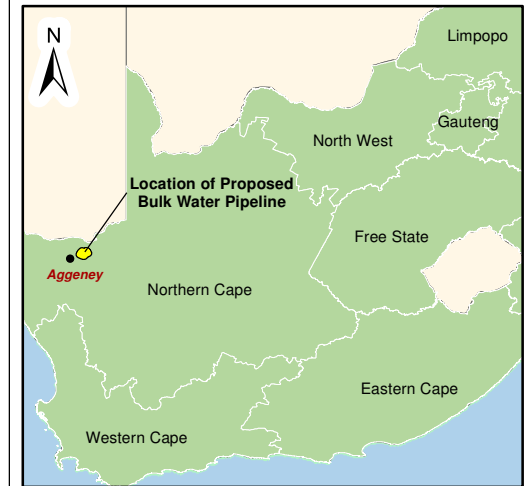
The proposed upgrade will occur within the confines of the registered servitude: Servitude Number: K345/1981S (See registered servitude deeds in Appendix C).

1.2.4 Project Timeline

The implementation of the Bulk water pipeline upgrade according to Black Mountain Mining (Pty) Ltd will take place over a period of 24 months.

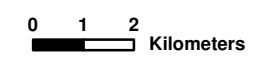


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Legend

- Proposed Underground Bulk Water Pipeline
- Existing Bulk Water Pipeline
- Towns / Villages
- Main Roads
- Secondary Roads
- Rivers and Streams
- Gamsberg Mining Right Area



Scale: 1:150 000 @ A3
 Projection: Transverse Mercator
 Datum: WGS1984, Lo19

Gamsberg Smelter Project

Figure 1

Local Setting



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1.2.5 Project description

Existing Water Infrastructure

Sedibeng Water (previously the Pelladrift Water Board) is authorised to abstract 16 060 000m³ per annum (daily abstraction of 44 ML/day) of water from the Orange River for domestic and industrial purposes (Authorisation for the abstraction of water -B159/1/77/12/5 of 30 September 1999 and Registered under Certificate No 25035649 of 25 June 2009, which superseded 121/77/12/5/78 of 01 December 1978). The existing underground water pipeline and associated reservoirs are located within an existing registered servitude owned by Sedibeng Water (Servitude Number: K345/1981S). Refer to Figure 2 below for a schematic diagram of the existing water supply system.

The current existing infrastructure includes the following (please refer to Appendix A for the General Layout map showing existing and proposed new infrastructure):

- Abstraction point with pump station (low lift pump station) along the Orange River near Pella, with an existing design pumping capacity of 40.8 ML/day;
- 1.1 km pipeline connecting the Orange River pump station to the Water Treatment Plant (WTP);
- WTP with an existing design treatment capacity of 27.5 ML/day;
- High-Lift Pump Station for the single lift steel pipeline with a capacity of 12.5 ML/day;
- One 400mm diameter steel underground bulk water pipeline approximately 30 km in length from the WTP to Horseshoe Reservoirs;
- One 500mm diameter above ground bulk water pipeline approximately 30 km in length from the WTP to the Horseshoe Reservoirs, including two pump stations with a capacity of 20 ML/day (within the same servitude as the underground pipeline) approved under the Northern Cape Department of Environment and Nature Conservation (NCDENC) Environmental Authorisation (EA) (NC/BA/NAM/KHA/PEL-AGG1/2012 and NCP/EIA/0000190/2012 and under the General Authorisation for water use activities (27/2/1/D182/1/3/4/5) from the Department of Water and Sanitation (DWS);
- Two reservoirs (Horseshoe Reservoirs) with an existing storage capacity of 2 ML each (4 ML in total);
- A 400mm diameter AC underground water pipeline from the Horseshoe Reservoir to the Kokerboom and Saddleback reservoirs, extending over a distance of 20km;
- The Kokerboom reservoir with an existing storage capacity of 1.2 ML;
- Saddleback reservoir with an existing storage capacity of 20 ML; and
- Power for the existing WTP, High-Lift Pump Station and Tower (Low-Lift) Pump Station is sourced from the Eskom Pelladrift Sub Station, consisting of two 5 Mega Volt Ampere (MVA) transformers. No upgrade is required for the additional infrastructure.

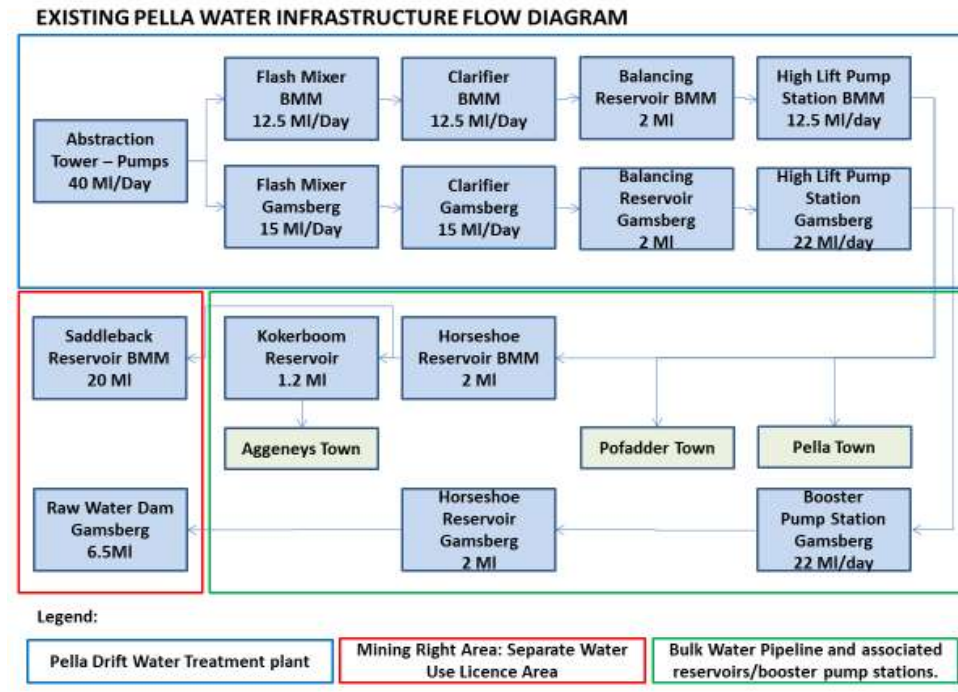


Figure 2 Existing Infrastructure Flow Diagram

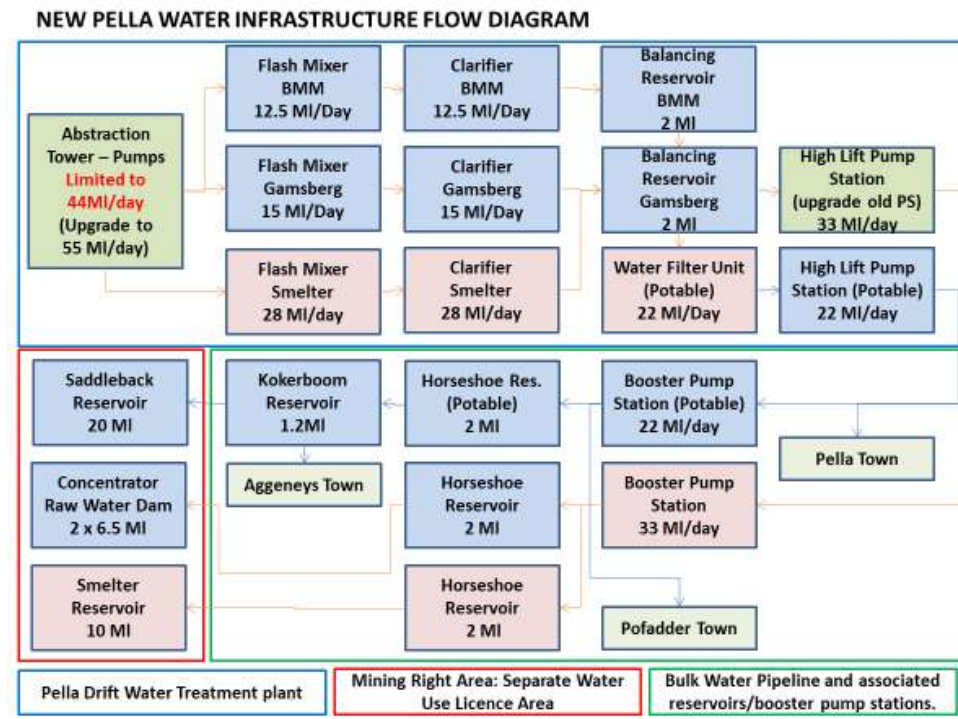


Figure 3 Existing and New Infrastructure Flow Diagram

Proposed Bulk Water Pipeline Augmentation

The proposed new bulk water pipeline and associated infrastructure is included in Figure 3. In order to ensure that the pipeline capacity will meet the future water demands and allow for the complete

utilization of the currently licensed abstraction volume of 44 ML/day, Black Mountain Mining (Pty) Ltd is proposing to replace and upgrade the existing old underground pipeline with a new underground bulk water pipeline on behalf of Sedibeng Water. Upon completion of the pipeline the ownership will be transferred to Sedibeng Water. The existing underground pipeline will be decommissioned and removed and replaced by the new upgraded pipeline. The new underground pipeline will, be laid in the existing servitude. The following sections describe the portions of the new underground pipeline and the relevant upgrades to the existing infrastructure that would be required.

Intake Water System

There is currently an intake tower in the Orange River near to Pella (Figure 3) from which water is abstracted (See Appendix A). Currently the Sedibeng Water has a permit to abstract 44ML/day, however the current abstraction is only 40 ML/day. There is thus capacity available to abstract a further 4 ML/day. Additional water capacity has been set aside for the towns Pella (0.5ML/day), Pofadder (1ML/day) and Aggeneys (2ML/day) bringing the total water use to ± 43 ML/day. In order to pump this additional volume, the capacity of the intake pumping system would need to be increased. From studies undertaken on the existing intake tower, it has been observed that the footprint of the existing abstraction tower is satisfactory for the additional water demand and this could be achieved by replacing the existing pumps with three new variable speed drives with higher capacity pumps. The capacity of each pump would be 27.6 ML/day (1 150m³/hr) at a 35 m head. The necessary modification of the existing foundations will be done as per requirement and will be limited to superstructure alterations only.



Figure 4 Abstraction tower in the Orange River

Pipeline from the Low-Lift Pump House to the WTP

The existing Diameter Nominal (DN) 500 steel piping inside the existing intake tower would be replaced with DN 600 carbon steel pipe which is 100mm larger than the existing DN 500 steel pipe. A pipeline similar and parallel to the existing pipe from the low-lift pump house within the abstraction tower to the WTP is envisaged. From the pump house this pipeline would be laid over the existing bridge covering a distance of approximately 90 m. Thereafter it would be buried underground up to the WTP. The overall length of this pipeline is approximately 1.1 km. The two pipelines would be connected before feeding the flash mixers within the WTP to form a closed loop. Necessary flow control valves, isolation valves and surge protection systems would be provided.

Upgrade of WTP

A new clarification plant with a 28 ML/day capacity would be constructed at the Pella WTP. The new clarification unit will comprise coagulant (two 1 000 litre tanks with combined coagulant/ flocculant), chlorine gas (four 1 000 kg tanks, two in operation and two storage – these tanks are already installed and approved) and flocculant dosing facilities, a flash mixer (28 ML/day), and other associated facilities and a sludge handling system. Chemical dosing facilities which would include storage tanks, dosing pumps etc. would be installed to treat up to 55 ML/day of water.

Space available in the existing chemical room would be used for housing the new chemical dosing facilities with chemical storage provided by the ‘chlorine tank and storeroom’ which is next to the chemical store (refer to Appendix A). One additional 22 ML/day filter system and two additional sludge ponds, the same as the existing one, would also be installed with a total capacity of 1 875m³ for both sludge ponds and 937.5 m³ each. The sludge is not considered to be hazardous as it consists predominantly of suspended solids (soil, clay, grit, and detritus) which only negatively affects the aesthetic quality of the water.

Bulk Water Pipeline Upgrades (Between Pella WTP and Horseshoe Reservoirs)

The existing underground pipeline from Pella WTP to Horseshoe Reservoirs will be decommissioned and removed. The new underground pipeline would be laid within the existing underground water pipeline excavation. The new pipeline would be laid from the WTP to the Horseshoe Reservoirs, covering a total distance of approximately 30km.

The proposed pipeline upgrades in this section comprise the following:

- High-lift pump house to the Horseshoe Reservoirs - construction of a new 600 mm diameter ductile iron underground pipeline from the high-lift pump house to the Horseshoe Reservoirs. The length of the pipeline is approximately 30 km; and
- Horseshoe Reservoirs to Gamsberg Zinc Mine - the existing pipeline from the Horseshoe Reservoirs to the Gamsberg Zinc Mine will be upgraded with a new 630mm diameter HDPE pipeline which will run in parallel to the existing above ground pipeline (**this section of the pipeline is within the Gamsberg Zinc Mine Mining Right Area (MRA) and as such will be included in the Gamsberg Smelter EIA - Ref: NCS 30/5/1/2/2 (518)MR**).

The pipeline from the Horseshoe Reservoirs to BMM will not be upgraded and will remain as they are.

All the sections of the new pipeline, as well as the associated infrastructure mentioned above, will be placed within the existing servitude or on land owned by the mine.

Horseshoe Reservoirs

There are two existing reservoirs at Horseshoe, each with a storage capacity of 2ML. A new 2 ML reservoir (Reservoir 3) would also be constructed on this site with a footprint of 225 m² in close proximity to the existing Horseshoe Reservoirs (namely Horseshoe Reservoir 3). Horseshoe Reservoir 3 will be within the existing servitude. There is no licence for the original reservoir which was constructed by the Pella Water Board (now Sedibeng Water). The second existing reservoir was approved under a General Authorisation (Water use Certificate 10181000 in Appendix D).

Table 3 Horseshoe Reservoir 3 design parameters

Name	Dam type	Storage capacity	Wall height	Inundation area
Horseshoe Reservoir 3	Concrete	2 MLD / 2000m ³	6m	900m ²

Power Supply

Power for the existing WTP, High-Lift Pump Station and Tower (Low-Lift) Pump Station is sourced from the Eskom Pelladrift Sub Station, consisting of two 5 MVA transformers. No upgrade is required for the additional infrastructure.

Power for the existing Booster Pump Station is sourced from the 4 MVA 66/11 kV Gamsberg transformer via an 11kV power line, 26km south-west of the pump station. This power line and transformer can only supply 2 MVA to the booster station and must therefore be upgraded. The total power needed for the new and old booster pump station will be 5 MVA. The Eskom midway Sub Station is approximately 3 km away from this 11 kV power line but needs to be upgraded from 1 x 5 MVA to 2 x 10 MVA transformers in order to provide sufficient power to the booster pump station. The supply voltage of the power line must change to 22kV as well as the transformers at the booster pump station.

The footprint for the upgraded booster pump station will be ~50 m². Due to terrain constraints the upgraded substation must be moved a short distance to allow for the additional infrastructure.

Booster Pump Stations and New Booster Pump Station Reservoir

As good engineering practice, an additional booster pump-house has been provided for the Gamsberg piping network. It is located between the high-lift pump house and the Horseshoe Reservoirs and facilitates a low-pressure circuit. Both the high-lift pump house and booster pumphouse of the Gamsberg circuit have four pumps each having a 7.536 ML/day (314 m³/hr) capacity and associated piping which has been designed considering three (3) pumps are working at a time. Currently two (2) pumps are under operation as these are sufficient to cater for the present water demand. The proposed new booster pumping system will allow for 460 m³/hr of water to be pumped towards the Horseshoe Reservoirs. The reservoir will have a capacity of 0.85 ML or 850 m³.

The booster pump station and reservoir will be adjacent to the existing booster pump station and within the servitude.

The following should be noted:

- All new water infrastructures will be located within the existing servitude. For ease of reference, the centre point coordinates of various sections of the registered servitude are attached as Appendix A;
- The residual effluent discharge from the WTP is not classified as hazardous waste;
- The volume of residual effluent discharge to the sludge drying beds is approximately 0.1 % of the total volume of water abstracted from the Orange River; and
- The volume of clay content in effluent discharge is approximately 1 - 6% of the total volume of water discharged from the clarifier, depending on actual turbidity of the raw water taken from the Orange River. The existing and upgraded WTP will remain outside the 1:100-year floodline of the Orange River.

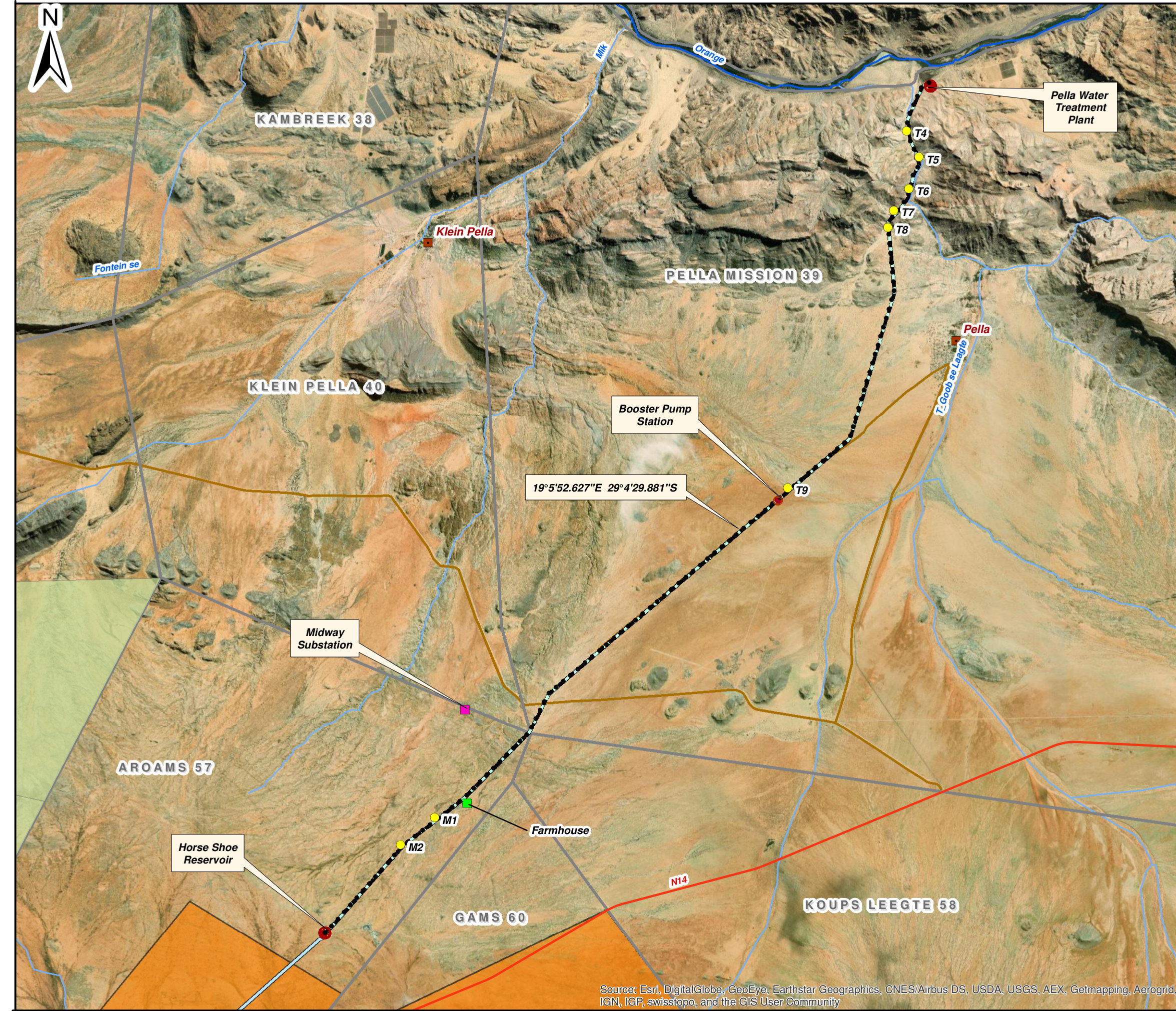
It is assumed, for purposes of this Basic Assessment process that any waste generated by the Pella Water Board's WTP will not trigger the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM: WA).

1.2.6 Project Activities

The key design and construction activities associated with the proposed project include:

- Route surveys;

- Detailed design of the pipeline alignment, geometry and infrastructure;
- Site laydown areas;
- Transportation of construction materials and staff;
- Material stockpiling;
- Traffic diversions;
- Demolition of existing underground pipeline infrastructure;
- Clearing of vegetation;
- Site establishment including storm water controls;
- Stripping and stockpiling of soil resources in accordance with a Soil Management Plan;
- Bulk earthworks (cut and fill);
- Grading and layer works;
- Construction of engineered base layers;
- Construction of storm water infrastructure (where necessary);
- Collection, storage and removal of construction related waste;
- Perimeter fencing; and
- Landscaping and rehabilitation.



- Legend**
- Proposed Underground Bulk Water Pipeline (within the existing servitude)
 - Existing Bulk Water Pipeline
 - Towns / Villages
 - Main Roads
 - Secondary Roads
 - Rivers and Streams
 - Farm Boundaries
 - Gamsberg Mining Right Area
 - Gamsberg Nature Reserve
 - River Crossings

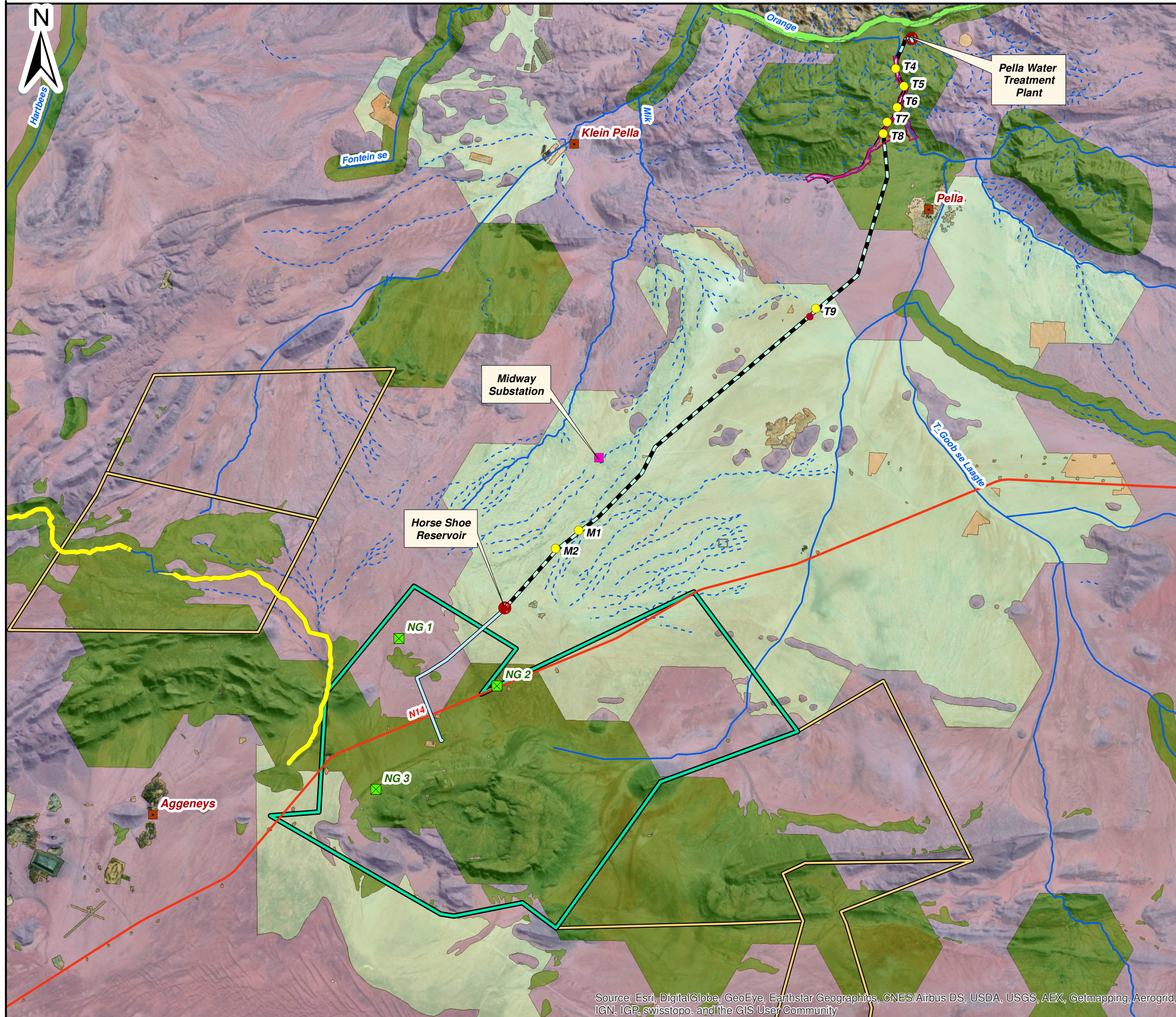
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Gamsberg Smelter Project

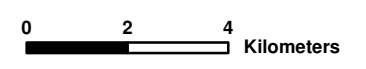
Figure 5
Proposed Pella Bulk Water Pipeline

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



- Legend**
- Proposed Underground Bulk Water Pipeline
 - Existing Bulk Water Pipeline
 - Towns / Villages
 - Main Roads
 - Rivers
 - Tributaries
 - Gamsberg Mining Right Area
 - Gamsberg Nature Reserve
 - Archaeological and Paleo Findings
 - River Crossings
 - 1 : 100 Year Floodline
 - 1 : 50 Year Floodline
 - NFEPA_Wetlands**
 - Floodplain wetland
 - Seep
 - CBA Categories**
 - Critical Biodiversity Area One
 - Critical Biodiversity Area
 - Ecological Support Area
 - Other Natural Areas



Scale: 1:150 000 @ A3
 Projection: Transverse Mercator
 Datum: WGS1984, Lo19

Gamsberg Smelter Project

Figure 6
Sensitivity



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2. AIMS OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME

The objective of this Environmental Management Programme (EMPr) is to give effect to the environmental risks identified as part of the Basic Assessment Report (BAR) and to provide for an overall environmental duty of care as required by Section 28 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA).

In this regard, the EMPr sets environmental targets for the Developer (Sedibeng Water) which would be passed onto the Business Partner (defined as the lead Business Partner and any nominated or selected sub-Business Partners). The Business Partner's performance can then be measured during construction. This document will form the basis for the environmental specifications that the Business Partner, in terms of the construction contract, will be obliged to adhere to during construction and Developer will be obliged to adhere to during the operational phase. This document will form a binding agreement between the Business Partner and Sedibeng Water.

Project aspects/activities covered by this EMPr are specified in Section 5. The associated environmental aspects include, but are not limited to, the following:

- Site clearing;
- Solid waste generation, storage and disposal;
- Water use;
- Effluent generation, storage and disposal;
- Establishment of laydown areas;
- Vehicle use and maintenance;
- Hazardous material storage and handling;
- Earthworks, excavations, layer-works and seal works;
- Installation of stormwater/drainage structures; and
- Revegetation/rehabilitation.

This EMPr has been prepared in compliance with Appendix 4 of the Environmental Impact Assessment (EIA) Regulations, 2014 (as amended), the contents of which are outlined in [Table 2-1](#) below.

Table 2-1: Requirements of an EMPr in terms of the EIA Regulations, 2014 (as amended).

	Content of EMPr	Completed (Y/N or N/A)	Location in EMPr
1 a)	<i>i) Details of the EAP who prepared the EMPr;</i>	Y	Section 3
	<i>ii) Details of the expertise of that EAP to prepare an EMPr, including a curriculum vitae;</i>	Y	Section 3
b)	<i>A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;</i>	Y	Sections 5
c)	<i>A map at an appropriate scale which superimposes the proposed activity, its associated infrastructure, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;</i>	Y	Appendix A
d)	<i>A description of the impact management outcomes, including management statements, identifying the impacts and risks that</i>	Y	Section 5

	Content of EMPr	Completed (Y/N or N/A)	Location in EMPr
	<i>need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including -</i>		
	<i>i) planning and design;</i>	Y	Section 5
	<i>ii) pre-construction activities;</i>		
	<i>iii) construction activities;</i>		
	<i>iv) rehabilitation of the environment after construction and where applicable post closure; and</i>		
	<i>v) where relevant, operation activities;</i>	Y	Section 5.3
f)	<i>A description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions -</i>	Y	Section 5.3
	<i>i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;</i>		
	<i>ii) comply with any prescribed environmental management standards or practices;</i>		
	<i>iii) comply with any applicable provisions of the Act regarding closure, where applicable; and</i>		
	<i>iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;</i>		
g)	<i>The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);</i>	Y	Section 5
h)	<i>The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);</i>	Y	Section 5
i)	<i>An indication of the persons who will be responsible for the implementation of the impact management actions;</i>	Y	Section 4.2 & Section 5
j)	<i>The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;</i>	Y	Section 5
k)	<i>The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);</i>	Y	Section 5
l)	<i>A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;</i>	Y	Sections 4.8
m)	<i>An environmental awareness plan describing the manner in which -</i>	Y	Section 4.4.4
	<i>i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and</i>		
	<i>ii) risk must be dealt with in order to avoid pollution or the degradation of the environment;</i>		

	Content of EMPr	Completed (Y/N or N/A)	Location in EMPr
n)	<i>Any specific information that may be required by the competent authority;</i>	N/A	
2)	<i>Where a government notice gazetted by the Minister provides for a generic EMPr, such generic EMPr as indicated in such notice will apply.</i>	N/A	

3. EXPERTISE OF THE EAP

The details and role of the Environmental Assessment Practitioners (EAPs) that were involved in the preparation of this EMP are provided in Table 3-1 below. Curriculum Vitae are attached as Appendix B.

SLR has no interest in the proposed Pella Bulk Water Pipeline Project other than fair payment for consulting services rendered as part of the EIA process.

Table 3-1: Expertise of the EAP

Responsibility	Basic Assessment Process - Project Manager
Qualification	BSc Hons. (Environmental & Geographical Science, University of Cape Town)
Professional Registration/ Membership	IAIAsa. EAPASA registration in progress.
Experience in years	12
Experience	Kate is a Senior Consultant based in Johannesburg. As a specialist environmental project manager, she has over 12 years of private sector experience in Environmental Consulting. Kate has worked as a project manager in the environmental field where she has developed core competencies in environmental management, project management and coordination and environmental monitoring, with a focus in the mining sector.

4. ADMINISTRATION AND REGULATION OF ENVIRONMENTAL OBLIGATIONS

4.1 MANAGEMENT STRUCTURE

Details of the management structure for the construction phase are presented below. All official communication and reporting lines including instructions, directives and information shall be channelled according to the organisational structure presented in Figure 7 below.

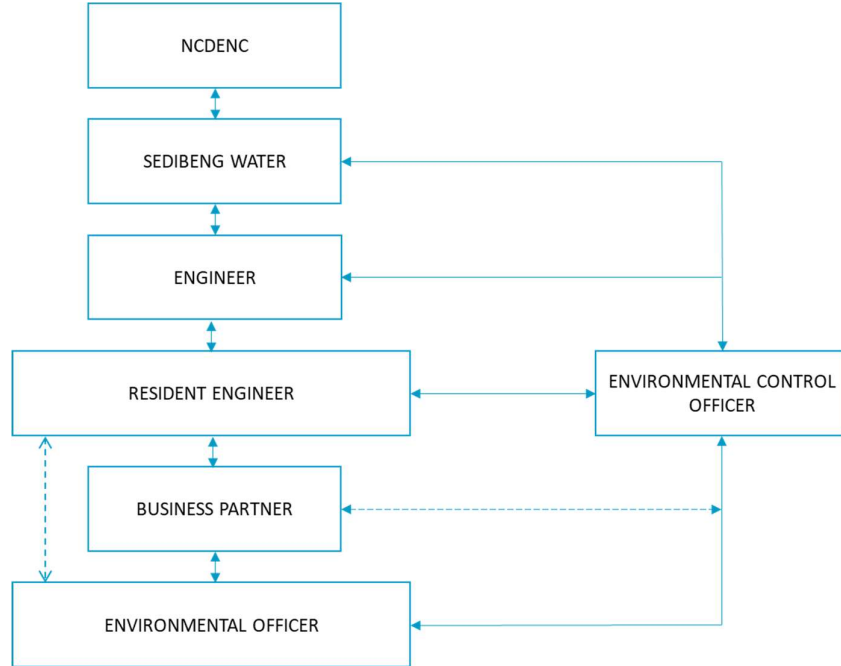


Figure 7 Construction Phase Organisational Structure

4.2 ROLES AND RESPONSIBILITIES

The implementation of this EMPr requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during the planning and design phase, construction and operational phases.

4.2.1 Northern Cape Department of Environment and Nature Conservation (NCDENC)

The NCDENC is the designated authority responsible for authorising this EMPr. The NCDENC has the authority to enforce legal action if Sedibeng Water does not comply with the relevant legislation, conditions of the EA and this EMPr.

The NCDENC will need to approve any amendments to the Environmental Outcomes set out in Section 5 of this EMPr, and may also perform inspections to assess compliance with the relevant legislation, the EA and the EMPr.

4.2.2 Developer

The Developer for the Pella Bulk Water Pipeline is Sedibeng Water who would ultimately be responsible for compliance with all conditions of the Environmental Authorisation and EMPr.

Sedibeng Water would be responsible for the appointment of the Engineer, Resident Engineer, Business Partner and Environmental Control Officer (ECO) during the construction phase.

Sedibeng Water would be responsible for the operational and decommissioning phases of the bulk water pipeline and associated infrastructure upgrades.

With respect to the pre-construction phase, the Developer is to:

- Implement the planning and design recommendations outlined in the EMPr (Section 5.1);
- Implement all recommendations included in the EMPr that will lessen the total environmental impact of the proposed Project from the design stage, through to construction (Section 5.2) and ultimately the operational phase; and
- Appoint required specialists (where relevant) to provide input into the pre-construction/ design phase.

With respect to the construction phase, the Developer is to:

- Ensure that all relevant approvals and permits have been obtained prior to the start of construction activities on-site;
- Ensure that the EMPr has been approved by the DENC prior to the start of construction activities on-site;
- Ensure that the NCDENC has been notified of the date on which construction activities will be starting, prior to commencement of the activity;
- Ensure that all conditions of approval have been complied with;
- Appoint a suitably qualified or experienced ECO prior to the start of construction activities on-site, and for the duration of the construction phase; and
- Sedibeng Water is responsible for the appointment of the Engineer, Resident Engineer, Business Partner and Environmental Control Officer (ECO) during the construction phase.

With respect to the operational phase, Sedibeng Water is to:

- Ensure that operation of the facility is undertaken in line with the requirements of the operational phase of the EMPr ([Table 5-3](#)); and
- Continuously seek to improve performance to minimise any negative environmental and social impacts which result from the operational phase.

4.2.3 Engineer

The Engineer shall oversee the planning, design and construction phases of the project. The Engineer shall appoint a Resident Engineer or Engineer's Representative (referred to as the RE) to act as the on-site implementing agent. The Engineer shall address any site issues pertaining to the environment at the request of the RE and / or the ECO.

The responsibilities of the Engineer are to:

- Ensure that the Business Partner's contract contains relevant clauses requiring their compliance with this EMPr and all applicable environmental permits / licences;
- Ensure that the requirements as set out in this EMPr and by the relevant Authorities are adhered to and implemented;
- Assist the ECO in ensuring that the conditions of the Construction Environmental Management Programme (CEMP) are being adhered to and promptly issuing instructions requested by the ECO, to the Business Partner. All site instructions relating to environmental matters issued by the Engineer are to be copied to the ECO;

- Assist the ECO in making decisions and finding solutions to environmental issues that may arise during the construction phase;
- Review and approve construction MSs with input from the ECO;
- Recommend to the Developer the removal of person(s) and / or equipment not complying with the EMPr specifications ; and
- Provide input into the ECO's ongoing internal review of the EMPr.

4.2.4 Resident Engineer (RE)

The RE would act as Sedibeng Water's on-site implementing agent and carries the responsibility to ensure that the Business Partner undertakes their construction activities in such a way that Sedibeng Water's environmental responsibilities are not compromised and ensure that the Business Partner's activities are executed in compliance with the EMPr.

Any on-site decisions regarding environmental management are the responsibility of the Engineer and / or RE in accordance with their delegated authorities. The RE shall assist the ECO where necessary, and shall have the following responsibilities in terms of the implementation of this EMPr:

- Conducting regular site inspections;
- Reviewing and approving the Business Partner's Method Statements (MSs) (with input from the ECO where necessary);
- Monitoring and verifying that the EMPr and MSs are adhered to at all times and taking action if specifications are not followed;
- Keeping a daily photographic record of construction activities on-site;
- Assisting the Business Partner in finding environmentally responsible solutions to issues with input from the ECO where necessary;
- Recommending to the Engineer the removal of person(s) and / or equipment not complying with the EMPr specifications;
- Recommending to the Engineer the issuing of fines for transgressions of the EMPr;
- Recommending to the Engineer delaying any construction activity if he / she believes the integrity of the environment has been or is likely to be seriously jeopardised;
- Providing input into the ECO's ongoing internal review of the EMPr;
- Communicating environmental issues to the ECO; and
- Reporting non-compliances to Sedibeng Water and the NCDENC (where required).

4.2.5 Environmental Control Officer (ECO)

The ECO will be a qualified and suitably experienced environmental specialist appointed by the Engineer to objectively and regularly monitor the Business Partner's compliance with the conditions of the EAs issued for the project and the approved EMPr. The ECO shall undertake site inspections, as agreed by the Employer, for the duration of the construction contract.

The ECO's duties shall include, inter alia, the following:

- Implementing the ECO responsibilities as outlined in the EA;
- Implementing specific actions assigned to the ECO in this EMPr;

- Ensuring the necessary EAs and permits, if any, have been obtained;
- Advising the Business Partner and / or the RE on environmental issues within defined construction areas;
- Reviewing MSs;
- Undertaking site visits to assess compliance with the EMPr and EAs;
- Keeping a photographic record of progress on-site from an environmental perspective;
- Developing and maintaining a database of environmental incidents and non-compliances with the EMPr and to ensure that these are investigated and remediated within reasonable timeframes;
- Report any significant environmental incidents to the NCDENC;
- Assisting the Business Partner and / or the RE in finding environmentally acceptable solutions to construction issues;
- Recommending additional environmental protection measures should this be necessary; and
- Providing a report back on the environmental issues at site meetings.

The ECO shall communicate directly with the RE. Should issues arise on-site that cannot be resolved between the ECO and the RE, the ECO shall take the matter up with the Engineer and / or Sedibeng Water. If Sedibeng does not respond the ECO shall take the matter up with NCDENC.

4.2.6 Business Partner

The Business Partner shall have the following responsibilities:

- To implement all provisions of the EMPr (if the Business Partner encounters difficulties with specifications, they must discuss alternative approaches with the RE and the ECO prior to proceeding);
- To ensure that all staff are familiar with the EMPr;
- To monitor and verify that the environmental impacts are kept to a minimum;
- To make personnel aware of environmental issues and ensure they show adequate consideration of the environmental aspects of the project;
- To prepare the required MSs;
- To report any incidences of non-compliance with the EMPr to the RE and the ECO; and
- To rehabilitate any sensitive environments damaged due to the Business Partner's negligence (this shall be done in accordance with the Engineer's and ECO's specifications).

Failure to comply with the EMPr may result in fines and reported non-compliance may result in the Engineer suspending the operation causing the non-compliance.

4.2.7 Environmental Officer (EO)

The Business Partner shall appoint a competent individual as its on-site EO to ensure that the EMPr is implemented and that all environmental specifications and EMPr requirements are met at all times. The EO shall be responsible for monitoring, reviewing and verifying the Business Partner's compliance with the EMPr.

The EO's duties in this regard shall include, inter alia, the following:

- Daily site inspections;
- Monitoring and verifying that the EA, EMPr and MSs are adhered to at all times and reporting to the ECO if specifications are not followed;

- Monitoring and verifying that environmental impacts are kept to a minimum;
- Submission of regular written reports to the Engineer and ECO (at least once a month);
- Assisting the RE and ECO in finding environmentally responsible solutions to issues;
- Keeping accurate and detailed records of these inspections;
- Reporting any incidents of non-compliance with the EMPr to the RE and / or the ECO; and
- Keeping a register of complaints on-site and recording community comments and issues, and the actions taken in response to these complaints.

Before the Business Partner begins each construction activity, the EO shall give to the RE a written statement setting out the following:

- The type of construction activity about to be started;
- Locality where the activity will take place;
- Identification of the environmental aspects and impacts that might result from the activity;
- The methodology of impact prevention for each activity or aspect;
- The methodology of impact containment for each activity or aspect;
- Identification of the emergency/disaster potential for each activity (if any) and the reaction procedures necessary to mitigate impact severity; and
- Treatment and continued maintenance of impacted environment (where applicable).

4.3 EMPr ADMINISTRATION

The EA and EMPr shall be issued to the Business Partner prior to finalisation of any tender process in order to ensure that the Business Partner makes appropriate financial provision in their budget to ensure compliance with the EA and this EMPr.

Copies of the EA and this EMPr shall be kept at the construction site office and shall be distributed to the EO and all other senior contract personnel. All senior personnel shall be required to familiarise themselves with the contents of this document.

The RE may order the Business Partner to suspend part or all of the works if the Business Partner fails to comply with the specifications set out in the EA, EMPr and MSs. Such suspension will be enforced until compliance is achieved. The construction contract shall make provision for such suspension and penalties.

4.4 COMMUNICATION STRUCTURES

4.4.1 Method Statements

The Business Partner (through the EO) shall submit written MSs to the RE and ECO for all environmentally sensitive aspects of the work. MSs shall cover applicable details with regard to the following, as appropriate:

- Type of construction activity and construction procedures;
- Timing and location of the activity;
- Identification of the environmental aspects and impact that might result from the activity;
- The methodology for impact avoidance or minimisation for each activity or aspect;
- Materials and equipment to be used;
- Getting equipment to and from site;
- How the equipment / material will be moved while on-site;

- How and where material will be stored;
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- Treatment and continued maintenance of impacted environment (where applicable);
- Compliance/non-compliance with the EA and EMPr; and
- Any other information deemed necessary by the RE or ECO.

The MS's required are defined in Section 5.2.3. The RE and / or the ECO may specify any additional MSs as may be required.

A MS Control Sheet, signed by the Business Partner, must accompany each MS. MSs shall be submitted to the RE and ECO **at least ten (10) days prior** to the commencement of construction. It should be noted that MSs must contain sufficient information and detail to enable the RE and ECO to apply their minds to the potential impacts of the works on the environment. The Business Partner will also need to thoroughly understand what is required of him/her in order to undertake the works.

Work shall not commence until the RE and ECO has approved the MSs. Failure to submit MSs may cause the RE to order the Business Partner to suspend part or all of the works concerned until a MS has been submitted and approved. Any damage caused to the surrounding environment shall be rehabilitated at the Business Partner's cost.

Information Boards

The Business Partner shall be responsible for erecting general information boards at appropriate locations on-site. The general information board (in English and Afrikaans) shall provide the name and contact number of the EO, to ensure that the public has access to the RE to request information and/or to lodge any complaints. The EO shall report complaints to the Engineer, RE and ECO. One of these information boards shall be erected at the main site office.

4.4.2 Community Relations

The construction phase Business Partner should continue to engage with stakeholders throughout the project construction and Sedibeng will engage during the operational phases. Communication with local communities (i.e. Pella and Aggeney's) and other local stakeholders will be a key part of this engagement process and is one where Sedibeng Water and the Business Partner's will need to work closely together. Development of a Community Engagement Plan (CEP), or a review and update if there is an existing plan, is important to facilitate this communication.

The objectives of the CEP are the following:

- To provide residents in the vicinity of the proposed infrastructure and other interested stakeholders with regular information on the progress of work and its implications;
- To monitor the implementation of the EMPr and the impact on communities, in order to ensure that mitigation measures are implemented and the mitigation objectives achieved; and
- To manage any disputes between Sedibeng Water, the Business Partner's and local communities.

Grievance Procedure

A grievance procedure should be developed if one is not already in place. The grievance procedure should be based on the following principles and commitments:

- It should be transparent;

- It should seek to resolve all grievances timeously; and
- Full written records of each grievance case and the associated process of resolution, including the final outcome, should be maintained and used to facilitate transparent, external reporting.

The grievance procedure should also:

- Require the development and maintenance of an up to date and comprehensive complaints register which would include the following information:
 - The date on which the complaint was raised or received;
 - The name and contact details of the stakeholder/group who raised the complaint (if by group, then the names of all the group members should be included);
 - A brief description of the complaint;
 - The manager responsible for the resolution of the complaint (dependent on the nature of the complaint); and
 - Due date for completion of the appropriate action, based on the time period specified in the procedure.
- The complaints register should also be updated with the following;
 - The date on which the action or decision was taken;
 - All and any communication with the stakeholder (date, method, and purpose);
 - The person/s responsible for the action or decision;
 - Nature of the action or decision; and
 - Date on which the complaint was escalated or finalised.
- All complainants will be offered an option of requesting confidentiality. The personal details of complainants will only be made available to those involved in the resolution of the grievance in question, and Sedibeng Water employees and other groups must follow policies related to protecting personal data when handling grievances; and
- Sedibeng Water will accept, record and seek to address grievances that are contained in anonymous complaint forms, however, due to the anonymous source of the grievance, Sedibeng Water would not be able to respond directly to the complainant.

Sedibeng Water should prepare responses to grievances in a timeous manner; an initial acknowledgement will be made within five working days and a timeframe provided for resolution, not exceeding two weeks, unless the grievance warrants additional time for investigation. The response should consider the complainants' views about the process, as well as provide specific remedies. Where needed, a relevant manager will communicate with the stakeholder to better understand the nature of the complaint before formulating a response. If the case is complex and the stated resolution timeframe cannot be met, an interim response will be provided (oral or written) that informs the stakeholder of the delay, explains the reasons, and offers a revised date for next steps. In the case of a particularly sensitive complaint, Sedibeng Water will engage an external organisation/third party in a joint investigation, in order to demonstrate transparency in the process.

Where Sedibeng Water uses another party to implement the construction phase, the other party's grievance procedure can be used provided that it follows the requirements as listed above.

4.4.3 Social Responsibilities

The Developer and Business Partners should encourage and implement wherever possible the procurement of locally based labour, skills and materials. In this regard Sedibeng Water should seek to offer equal employment opportunities which also address Broad Based Black Economic Empowerment (BBBEE) goals. Sedibeng Water will procure services, material and equipment from BBBEE suppliers with a rating of level 4 or better, where appropriate, and should give preference to suppliers from the Namakwa region.

4.4.4 Environmental Awareness Training

Before the commencement of any work on-site, the Business Partner's site management staff shall attend an environmental awareness training course, presented by the ECO. The Business Partner shall liaise with the ECO prior to the commencement date to arrange a date and venue for the course. The Business Partner shall provide a suitable venue with facilities and ensure that the specified employees attend the course. No induction or course should be given until the Engineer has been afforded the opportunity to appraise it and provide comment.

The information presented at the course shall be communicated by the Business Partner site management staff to the rest of his employees on the site, to any new employees coming onto site after the initial training course and to their suppliers. The presentation shall be conducted, as far as is possible, in the employees' language of choice. As a minimum, training shall include:

- Explanation of the importance of complying with the EA and EMPr;
- Discussion of the potential environmental impacts of construction activities;
- Explanation of the management structure of individuals responsible for matters pertaining to the EMPr.
- Employees' roles and responsibilities, including emergency preparedness;
- Explanation of the mitigation measures that must be implemented when carrying out their activities; and
- Explanation of the requirements of the EA and EMPr.

The Business Partner shall keep records of all environmental training sessions, including names of attendees, dates of their attendance and the information presented to them. Records of environmental training sessions shall be submitted to the RE and ECO.

4.4.5 Meetings

The ECO shall meet (or otherwise connect) with the RE and EO on a monthly basis, or more frequently as may be required during the initial stages of the project. The ECO shall prepare a feedback report to be tabled at monthly site meetings and is not required to physically attend scheduled construction-site meetings (Business Partner/ Engineer /RE /EO) throughout the contract period.

4.5 INSPECTION PROCEDURES

The day-to-day monitoring and verification that the EMPr is being adhered to shall be undertaken by the RE and the EO.

The ECO shall visit and inspect the site on a monthly basis to ensure that correct procedures are being implemented and that the Business Partner is complying with the EA and requirements of the EMPr. Additional site inspections by the ECO may be needed during the initial stages of the project. The ECO shall address any queries to the Business Partner / RE/ EO. If the queries cannot be resolved at this level, they will be referred to the Engineer, and, if necessary, to Sedibeng Water.

4.6 RECORD OF ACTIVITIES

The EO shall keep a record of activities on-site, including but not limited to:

- Meetings attended;
- Site inspections;
- Internal audits;
- Monitoring results;
- MSs;
- Issues arising on-site, cases of non-compliance with the EA and EMPr;
- Penalties issued;
- Complaints received and corrective action taken; and
- Environmental incidents and corrective actions taken.

The EO and RE shall undertake daily photographic monitoring of the site. This shall include a photographic record of all areas that will be impacted by the construction activities prior to construction activities commencing. The ECO shall monitor all sensitive work environments (e.g. watercourse crossings), which may also include photographic monitoring.

4.7 FINES

A system of fines / contractual penalties shall be implemented to ensure compliance with the EMPr. Where the Business Partner or their sub-Business Partners inflict damage on the environment or fail to comply with any of the environmental specifications of the EA or EMPr, the Business Partner may be liable to pay a fine / incur penalties in terms of the contract. The Business Partner is deemed to not have complied with the EMPr if:

- There is evidence of contravention of the EMPr specifications, including any non-compliance with an approved MS;
- Construction activities take place outside the defined boundaries of the site;
- Environmental damage ensues due to negligence;
- The Business Partner fails to comply with corrective or other instructions issued by the RE/ECO within a specific time period; and/or
- The Business Partner fails to respond adequately to complaints.

Business Partner Failure by any employee of the Business Partner or their sub-Business Partners to show adequate consideration to the environmental aspects of the contract shall be considered sufficient cause for the ECO to recommend to the RE to have that employee removed from the site. The ECO may, through the Engineer, also order the removal of any equipment that is causing environmental damage.

4.8 INTERNAL AUDITING AND REVIEW

The Business Partner shall establish an internal inspection and review procedure to monitor the day-to-day implementation of the EA and EMPr requirements. Internal inspections shall be conducted by the EO on a weekly basis. The EO audit reports shall be submitted to the RE and ECO. Internal audits and inspections shall include an assessment of performance against the requirements of other environmental licences or permits (e.g. water use authorisation, flammable substance certificates, Integrated flora permits, Protected Tree permits, etc.).

The following shall be implemented to address non-compliances with the EMPr or other environmental issues related to construction activities. Timeous planning, intervention and corrective action to deal with EMPr non-compliance and key environmental issues is essential. All instructions and records of measures implemented to address the issues shall be kept on file.

- Where necessary, the ECO should issue EMPr instructions to Business Partners on-site to address and correct non-compliances with the EMPr and specific environmental issues pertaining to the project footprint and surroundings.
- The ECO should report environmental incidents and EMPr non-compliances (that could result in significant environmental damage or pollution) to the RE who will then be responsible for reporting to the Engineer and competent authorities.
- The EO is to report environmental incidents, complaints, and EMPr non-compliances (that could result in notable environmental damage or pollution) to the ECO.

The ECO shall undertake a monthly audit of compliance with the relevant environmental requirements and identify the need for any amendments to the EMPr in order to improve its effectiveness in avoiding or minimising any negative environmental impacts. Any recommended amendments to the EMPr outcomes must be approved by the NCDENC and communicated to the relevant stakeholders, as per the requirements of the EIA Regulations, before the amendments to the EMPr are implemented. Any such amendments to the EMPr shall be registered in the daily records of the EO.

At the conclusion of the construction phase a final environmental audit report shall be compiled and submitted to NCDENC. This report shall be compiled by the ECO in collaboration with the RE, EO and the Business Partner. It will outline the implementation of the EMPr and highlight any issues that arose during the construction period to report, on a formal basis, the lessons learned on the project.

5. IMPACT MANAGEMENT OUTCOMES AND ACTIONS

Various activities/aspects associated with the planning and design phase and the construction phase of the proposed Pella bulk water pipeline and associated upgrade of infrastructure have been identified. For each activity/aspect, a set of impact management outcomes is prescribed along with recommended actions (see Table 5-1 and Table 5-2).

In order to facilitate monitoring and auditing, the tables have been structured to indicate the identified environmental outcomes, management actions to be implemented, responsible parties for implementation, timing of implementation, records/indicators of compliance to be obtained and the monitoring requirements associated with the various activities/aspects, as appropriate.

Project activities/aspects covered by this EMP include, but are not limited to, the following:

- Policies for the recruitment and use of local labourers and local suppliers;
- Establishment of laydown areas;
- Site clearing;
- Solid waste generation, storage and disposal;
- Water use;
- Effluent generation, storage and disposal;
- Vehicle use and maintenance;
- Road material storage and handling;
- Hazardous material storage and handling;
- Cement/concrete batching;
- Earthworks, excavations, layer-works and seal works;
- Installation of stormwater/drainage structures;
- Alien vegetation management; and
- Revegetation/rehabilitation.

5.1 PLANNING AND DESIGN PHASE ENVIRONMENTAL MANAGEMENT PROGRAMME

5.1.1 Introduction

The Planning and Design Environmental Management Programme covers the phase prior to the start of construction and the various actions and activities that are required to be undertaken in this phase to minimise environmental damage once construction begins. The following sections highlight the various areas of focus.

5.1.2 Application

The roles and responsibilities in terms of the application and implementation of this EMPr have been outlined in Section 4.2 above.

5.1.3 Permit Requirements

Activities undertaken during site preparation, construction and operation may require additional permits, over and above the Environmental Authorisation. Sedibeng Water is responsible for ensuring that they hold the necessary permits in order to comply with national and local regulations.

5.1.4 Tender Documentation

Sedibeng Water shall ensure that this EMPr is included within the tender documents for all Business Partners tendering to undertake any aspects of the construction phase of the project.

In the adjudication of any tenders to undertake any aspect of the construction or operation of the proposed project, Sedibeng Water (or associated agent in this regard) must ensure that the costs of compliance with the EMPr have been adequately allowed for within the winning tender.

5.1.5 Additional Pre – Construction Requirements

The following requirements also need to be undertaken:

- Notify all registered I&APs and key stakeholders of the opportunity for appeal of the Environmental Authorisation;
- Notify NCDENC prior to commencement of construction;
- A Health and Safety Plan must be developed prior to the commencement of construction, to identify and avoid work-related accidents;
- Sedibeng Water should establish a recruitment and procurement policy which sets reasonable targets for the employment of local residents /suppliers;
- A Code of Conduct must be developed for all workers (Sedibeng Water and Business Partners including their workers) directly related to the project, the objective of which is to limit, where possible, social ills brought about by the construction and operation of the facility;
- Develop and implement a grievance procedure as defined previously; and
- Screening for threatened or protected plant species as well as protected trees and if recorded, submission of permit application to NCDENC and DAFF according to the relevant legislation.

5.1.6 Planning and Design Phase Actions and Outcomes

In order to ensure compliance with environmental legislation, the following actions are applicable to the planning and design phase for the water infrastructure upgrades. The persons responsible for implementation of the actions are listed in [Table 5-1](#), the majority of which are the responsibility of Sedibeng Water.

Key activities during the planning and design phase will include:

- Pre-construction monitoring as per [Table 5-1](#);
- Notification of NCDENC and other relevant authorities of final layout (if required) and additional mitigation / management measures, where needed;
- Drafting of subsidiary plans, policies and procedures;
- Developing, with the Business Partner, the following:
 - A Site Layout Plan; and
 - MSs.

These activities are described in more detail in [Table 5-1](#).

Table 5-1: Environmental Management Programme Applicable to the Planning and Design Phase

Aspect		Objective/ Outcome	Mitigation		Responsibility	Parameters for Monitoring	Timing
#	Description of Aspect		#	Management Action			
1.	Stakeholder engagement	Notify all registered Interested and Affected Parties of Environmental Authorisation (EA).	1.1	Notify all registered I&APs and key stakeholders of the opportunity for appeal of the Environmental Authorisation.	EAP	Notices sent to relevant parties on the stakeholder database. List of those to whom it was sent on file.	Within 12 days from the issuing of the Environmental Authorisation.
2.	Permit requirements	Ensure compliance with legal and other permitting requirements.	2.1	Ensure that all relevant legal requirements have been met.	Developer	Permits	Prior to construction
3.	Finalisation of EMPr and Business Partner Compliance Standards	Update EMPr with EA conditions and other mitigation measures from monitoring.	3.1	Incorporate additional mitigation measures specified by NCDENC in the EA into the EMPr and Business Partner Compliance Standards.	ECO	EMPr and Business Partner Compliance Standards	Prior to construction
4.	Authority notification	Ensure that NCDENC are notified of commencement date.	4.1	Notify NCDENC prior to commencement of construction.	Developer	Proof of communication	At least 14-days in advance of commencement of construction.
		Keep NCDENC (Compliance Department) informed of any aspects of non-compliance with EMPr or EA	4.2	Notify NCDENC with reasons if any provisions of the EMPr or EA cannot be implemented, and provide alternative/s	Developer	NCDENC notification	Prior to construction
		Keep NCDENC informed of current contact details of applicant.	4.3	Notify NCDENC of any change of contact details of the applicant	Developer	NCDENC notification	Prior to construction
		Keep NCDENC informed of contact details of ECO	4.4	Submit the name and contact details of the appointed ECO prior to construction	Developer	NCDENC notification	Prior to construction
5.	Adherence to EMPr	EMPr included in Business Partner Contract	5.1	The approved EMPr must be included in all tenders for Business Partners and the adherence thereto written into the Contract.	Developer	Proof of EMPr in Contract with Business Partner	Prior to construction
6.	Subsidiary Plans	Develop Subsidiary Plans to minimise environmental and social risks	6.1	The following subsidiary plans may be required prior to construction: <ul style="list-style-type: none"> • Health and Safety Plan; • HIV Policy and Awareness Plan; • Rehabilitation Plan; • Soil Management Plan • Alien Invasive Plant Management Plan; • Recruitment and Procurement Policy; • Code of Conduct; • Grievance Procedure; • Chance Find Procedure; 	Developer	Relevant Plans	Prior to construction

Aspect		Objective/ Outcome	Mitigation	Responsibility	Parameters for Monitoring	Timing	
			<ul style="list-style-type: none"> Waste Management Plan; and Community Engagement Plan. 				
7.	Health and safety	Ensure the health and safety of site personnel during construction.	7.1	<p>A Health and Safety Plan must be developed prior to the commencement of construction to identify and avoid work related accidents. This shall include:</p> <ul style="list-style-type: none"> Chemical ablution facilities; and Plans for training workers on the potential risks associated with the construction and operational phases of the Project. 	Developer	Health and Safety Documentation	Prior to construction
			7.2	Develop an Emergency Preparedness and Response Plan (EPRP) that covers all the potential risks associated with the construction and operational phases of the Project.	Developer	Emergency Preparedness and Response Plan	Prior to construction
8.	Employment and procurement of services and tender procedures	Ensure that employment and procurement of local, regional and national services is maximised.	8.1	<p>Sedibeng Water should work closely with the relevant local authorities, community representatives and NGOs to ensure that the use of local labour is maximised. This should include:</p> <ul style="list-style-type: none"> Local employment requirements must be agreed with the local authority and Business Partner upon advertising for jobs. Before any project commencement in Khâi-Ma Local Municipality – all Business Partners must meet with the local authority to discuss employment and local business opportunities. Clearly advertise the nature and numbers of jobs available during the project phases in surrounding communities, and ensure that communities understand the Project’s local recruitment procedures. Recruitment processes to be followed as agreed with the Khâi-Ma Local Municipality. A recruitment registry should be created for jobseekers to record relevant qualifications, work experience and contact details. Women and youth should receive preferential employment opportunities in the company recruitment policy, as far as possible. Performance indicators for promoting the employment of women and youth should be developed and implemented by the Project and Business Partners. Black Mountain Mining (Pty) Ltd will ensure that the Business Partners follow the required recruitment process and prioritise local people. Develop and implement a Community Skills Development programme to facilitate local employment. An updated skills database should be in place in advance of the construction Business Partner being appointed and should be kept up to date throughout the Project. The database should include documentation verifying the eligibility status of applicants. Considering the fact that construction related employment will only be for a relatively short-term, the skills registers 	Developer	Meeting minutes / advertisements	Prior to construction

Aspect		Objective/ Outcome	Mitigation	Responsibility	Parameters for Monitoring	Timing	
			<p>generated should be shared with other construction or infrastructure development companies in the regional study area.</p> <ul style="list-style-type: none"> • Where possible, labour-based methods of construction (e.g. digging of trenches), should be used to maximise the Project's requirements for unskilled labour. • Consider the unbundling of tenders to provide appropriate opportunities for local service providers. • Tender criteria should require Business Partners and sub-Business Partners to provide training and skills development to the locally recruited workforce. Where possible, training should be aimed at providing skills to employees that might allow them to apply for any permanent positions that become available once construction is complete, or at the proposed Gamsberg Smelter Project. • Provide employees with reference letters that they can submit to gain further employment. Also, provide certificates of completion for on-the-job training. • Follow-up compliance monitoring should also be undertaken to ensure that the Project and its Business Partners honour local employment policies and other measures to enhance local employment. Feedback to local communities should be undertaken on a regular basis in a transparent manner. 				
			8.2	Ensure that the appointed project Business Partners and suppliers have access to Health, Safety, Environmental and Quality training as required by the project.	Developer	Procurement contract and Recruitment Policy	Prior to construction
			8.3	Performance indicators for promoting the employment of women and youth should be developed and implemented by the Project and Business Partners. The positions reserved for these groups may only be filled with persons outside of these categories when it can be demonstrated that no suitable persons are available.	Developer	Recruitment Policy	Prior to construction
			8.4	<p>Establish a procurement policy which:</p> <ul style="list-style-type: none"> • sets reasonable targets for the procurement of goods and services from South African residents /suppliers, particularly local residents as far as possible; and • identifies and invites bids from local suppliers. 	Developer	Procurement policy	Prior to construction
			8.5	Adopt transparent adjudication process for tender awards.	Developer	Demonstrate transparent process of adjudicating tenders	Prior to construction
			8.6	Sedibeng Water will identify local Namakwa suppliers (as a first preference) with the appropriate level of capacity to supply goods and services over the operational lifetime of the project (specifically BBBEE companies).	Developer	Proof of suppliers	Prior to construction

Aspect		Objective/ Outcome	Mitigation		Responsibility	Parameters for Monitoring	Timing
			8.7	Sedibeng Water to ensure that the appointed project Business Partners and suppliers have access to Health, Safety, Environmental and Quality training as required by the Project.	Developer	Procurement contract	Prior to construction
9.	Social ills and disruption	To limit, where possible, social ills brought about by the construction phase	9.1	Develop an induction programme, including a Code of Conduct, for all workers.	Developer	Code of Conduct	Prior to construction
			9.2	All workers will agree to the Code of Conduct and be aware that contravention of the Code could lead to dismissal.	Developer	Code of Conduct	Prior to construction
			9.3	A Grievance Procedure will be established whereby complaints are recorded and responded to.	Developer	Grievance Procedure	Prior to construction
			9.4	An HIV Policy and Awareness Plan must be developed and implemented.	Developer	HIV Policy	Prior to construction
10.	Traffic impact	Minimise negative effects associated with the increase in traffic.	10.1	Sedibeng Water will develop a Traffic Management Plan (TMP) including strict controls over driver training and qualifications, vehicle maintenance, vehicle certifications, speed restrictions, appropriate road safety signage, and vehicle loading and maintenance measures. Ensure that this TMP includes measures to reduce the need to drive at night and during peak traffic times, as well as to ensure vehicular activities are staggered as much as possible.	Developer	Traffic Management Plan	Prior to construction
			10.2	All necessary transportation permits will be applied for at this stage and obtained from the relevant authorities, including permits for abnormal loads if required. Oversee acquisition of permits required by Business Partners.	Developer	Permits	Prior to construction
11.	Waste management	Prevent soil and/or groundwater contamination from waste.	11.1	A suitable area for waste skips must be selected, away from drainage lines at appropriate stages along the length of the pipeline alignment. and included in the final site layout plan with approval by the ECO.	Developer / Engineer	Site Layout Plan	Prior to construction
			11.2	A Waste Management Plan (WMP) for the project will be developed. This will follow the principles of waste minimisation at source, segregation for reuse, recycling, treatment or disposal. The WMP should include the following: <ul style="list-style-type: none"> • Waste quantities and types; • Waste recycling; • Temporary waste storage; and • Waste treatment and disposal. 	Developer / Engineer	Waste Management Plan	Prior to construction
			11.3	A refuse removal agreement shall be entered into with the local waste removal Business Partner .	Developer / Engineer	Site Layout Plan and Traffic Management Plan	Prior to construction
12.	Impacts on vegetation	Screening and translocation of threatened or protected	12.1	Screening of all development areas by the ECO or any external ecologist/botanist is required to screen and identify any threatened or protected species as listed by the National Environmental Management Biodiversity Act, 2004 (Act No 10 of 2004) (NEM:BA, 2004) and the Northern Cape Nature Conservation Act, 2009 (Act No.	Developer/ Engineer / ECO	Search and Rescue Protocol	Prior to construction

Aspect		Objective/ Outcome	Mitigation	Responsibility	Parameters for Monitoring	Timing	
		species and protected trees		9 of 2009) (NCNCA, 2009) and any protected trees as listed by the National Forest Act, 1998 (Act No. 84 of 1998) (NFA, 1998). Should any species be required to be removed or translocated, the relevant permits must be applied for from the NCDENC and the DAFF and once permits are approved plants must be translocated.			
13.	Site establishment	Delineation of the project site to avoid or minimise damage to the environment	13.1	<p>Establish the site boundary/servitude prior to the start of construction.</p> <p>The planning and design for the laydown areas must be undertaken and these areas demarcated such that they avoid sensitive areas, and are preferably in an already disturbed or developed area. Screening for threatened or protected species within the footprint areas should be undertaken and once the relevant permits have been approved these species can be translocated.</p> <p>The Business Partner shall submit a MS indicating the layout and preparation of the laydown areas that meets the following requirements:</p> <ul style="list-style-type: none"> Laydown areas are located at an easily accessible point and within an area of low environmental sensitivity (Appendix A for sensitivity map); Laydown areas not located within 100 m or below the 1:100-year flood line of any watercourse, wetland or drainage line; Laydown areas not located within identified Critical Biodiversity Areas 1 or 2 (Figure 6 and Appendix A); Laydown areas are not located on steep areas; and Laydown areas are demarcated by a fence. <p>A laydown area plan must be approved by the ECO and RE.</p>	Business Partner	<p>Approved MSs indicating the location, preparation and layout of the laydown areas.</p> <p>Map/plan of construction laydown areas.</p> <p>RE approval of the final location of laydown areas.</p>	Prior to construction
14	Rehabilitation Plan	Successful site rehabilitation	14.1	<p>Detailed electronic colour photographs shall be taken of the proposed site before any clearing may commence.</p> <p>These records of the site should be kept by the EO, ECO, RE and Engineer for consultation during rehabilitation of the site in order to ensure that rehabilitation is, as a minimum, done to a standard similar to pre-construction.</p> <p>A rehabilitation plan must be compiled for the project, to be implemented from the onset of the activities. The plan must:</p> <ul style="list-style-type: none"> Provide detailed electronic colour photographs of the proposed site before any clearing may commence; These records of the site must be kept by the EO, ECO, RE and Engineer for consultation during rehabilitation of the site in order to ensure that rehabilitation is, as a minimum, done to a standard similar to pre-construction; Provide guidelines on how to restore the disturbed area to (as close as possible to) its natural state, the plan must also include the incorporation of natural vegetation, sloping plans as well as storm water management; 	Business Partner, ECO, RE, EO	Prior to construction	Photographs

Aspect		Objective/ Outcome	Mitigation	Responsibility	Parameters for Monitoring	Timing
			<ul style="list-style-type: none"> Rehabilitation of the disturbed areas existing in the project area must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type; Any succulents in the footprint of the area to be disturbed must be identified and removed from the proposed areas of disturbance and relocated; and Areas must be stabilised using appropriate indigenous vegetation (along the length of the pipeline) and geotextile matting (in areas with a gradient exceeding 20°). Indigenous grasses and shrubs found within the project area and surrounds would sustain the arid environment and are the preferred options. During the first year of establishment, these plants should be watered as often as possible to ensure their establishment. The first two to three weeks should be daily, thereafter weekly is recommended. This is subject to how the vegetation fairs during this time, and should be adapted accordingly. There is a risk of vagrant livestock impacting on this vegetation and fencing of these areas could be considered. 			

5.2 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PROGRAMME

5.2.1 Introduction

The Construction EMPr covers the construction phase and the various actions and activities that are required to be undertaken in this phase to minimise environmental damage. All construction activities shall observe the requirements of this Construction EMPr as well as any relevant environmental legislation. The Construction EMPr matrix is included in [Table 5-2](#).

5.2.2 Application

The roles and responsibilities in terms of the application and implementation of this EMPr have been outlined in Section 4.2.

5.2.3 Method Statements and Site Management

Any MSs (as defined in Section 4.4.1) required shall be produced by the Business Partner prior to the start of construction. The Business Partner shall not commence any activity until the relevant MS has been approved and shall, except in the case of emergency activities, allow a period of two weeks for approval of the MS by the Engineer. Such approval shall not be unreasonably withheld.

The Engineer or ECO may request any additional MSs for any activity they believe may impact on the environment.

The Business Partner shall ensure that copies of all approved MSs are readily available on the site and shall be communicated to all relevant personnel. The Business Partner shall carry out the Works in accordance with the approved MS. Approval of the MS shall not absolve the Business Partner from any of their obligations or responsibilities in terms of the Contract.

The following MSs shall be provided by the Business Partner and submitted to the Engineer, RE and ECO before site establishment:

Temporary Laydown Areas

The location, layout and method of establishment of the laydown areas (including offices, vehicle washing areas, fuel storage areas, batching areas and other infrastructure required for the construction of the project) should be clearly described including the methods for site demarcation and the associated screening for protected flora and fauna species in the footprint areas.

Protection of Flora and Fauna

Screening shall be undertaken for threatened or protected plant and animal species as well as protected trees and if recorded, submission of permit application to NCDENC and DAFF according to the relevant legislation.

Trapping, poisoning and/ or shooting of animals is strictly forbidden. No domestic pets or livestock are permitted on site during the construction phase. Where the use of herbicides, pesticides and other poisonous substances is deemed necessary, the Business Partner shall submit a MS and notify surrounding livestock farmers.

Business Partner shall ensure that snake handlers are identified and trained so that any snakes recorded on site are safely translocate by a trained and registered snake handler. Handling, removal or killing of any snakes is prohibited.

Erosion and Sedimentation Control

The Business Partner shall take all reasonable measures to limit erosion and sedimentation due to the construction activities. Where erosion and/or sedimentation, whether on or off the site, occurs despite the Business Partner complying with the measures being implemented, rectification shall be carried out in accordance with details specified by the Engineer. Where erosion and/or sedimentation occurs due to the fault of the Business Partner, rectification shall be carried out to the reasonable requirements of the Engineer.

Any runnels or erosion channels developed during the construction period or during the maintenance period shall be backfilled and compacted. Stabilisation of cleared areas to prevent and control erosion shall be actively managed. Consideration and provision shall be made for various methods, namely, brush-cut packing, mulch or chip cover, straw stabilising, watering, soil binders and anti-erosion compounds, mechanical cover or packing structures (e.g. Hessian cover). Screening of these area by botanist is required to ensure that no threatened or protected species are damaged/destroyed during rehabilitation.

Traffic and movement over stabilised areas shall be restricted and controlled, and damage to stabilized areas shall be repaired and maintained to the satisfaction of the Engineer.

Dust Control

The Business Partner shall take all reasonable measures to minimise the generation of dust as a result of construction activities to the satisfaction of the Engineer and ECO. In extreme instances, the use of specific dust suppressant additives may be necessary in order to limit dust generation from access roads.

During high wind conditions, the Business Partner shall comply with the Engineer's instructions regarding dust-suppression measures. The Engineer may request the temporary cessation of all construction activities where wind speeds are unacceptably high, and until such time as wind speeds return to acceptable levels.

Materials Handling, Use and Storage

The Business Partner shall ensure that any delivery drivers are informed of all procedures and restrictions (including "no-go" areas, sensitive vegetation types and water courses) required to comply with the EMPr. The Business Partner shall ensure that these delivery drivers are supervised during off-loading, by someone with an adequate understanding of the requirements.

Materials shall be appropriately secured to ensure safe passage between destinations. Loads including, but not limited to, sand, stone chips, fine vegetation, refuse, paper and cement, shall have appropriate cover to prevent spillage from the vehicle during transit. The Business Partner shall be responsible for any clean up resulting from the failure by his employees or suppliers to properly secure transported materials (including pipes).

All manufactured and/ or imported material shall be stored within the Business Partner's lay down areas and shall be subject to the Engineer's approval.

All building materials shall be stored in appropriately bunded areas such that there will be no runoff from these areas towards sensitive systems. All building materials shall be removed after construction.

Fuel (Petrol and Diesel) and Oil

All fuel is to be stored within a demarcated area in the Business Partner's laydown area. No refuelling of vehicles or machinery is to take place outside of this demarcated area unless authorised by the Engineer. The Engineer shall be advised of the area that the Business Partner intends using for the storage of fuel.

The Business Partner shall ensure that all liquid fuels (petrol and diesel) are stored in sealed tanks a minimum of 100 m away from any drainage line and outside of the 1:100 year floodline. Only empty and externally clean tanks may be stored on the bare ground. All empty and externally dirty tanks shall be sealed and stored in an area where the ground has been protected.

Tanks containing fuels shall be situated on a smooth, impermeable surface (plastic or concrete) base with a bund (if plastic, it must have sand on top to prevent perishing) to contain any possible spills and prevent infiltration of fuel into the ground. The impermeable lining shall extend to the crest of the bund and the bund should have a volume sufficient to store 110% of the total capacity of all the storage tanks within the bund.

The bund floor shall be sloped towards an oil trap or sump to enable any spilled fuel to be removed. A hydrocarbon absorption/remediation product approved by the ECO shall be installed in the sump to reduce the risk of pollution. Bulk fuel storage and bunded areas shall have overhead cover to prevent rain from entering the bunded area.

The Business Partner shall keep fuel under lock and key at all times.

If fuel is dispensed from 200 litre drums, the proper dispensing equipment shall be used, and the drum shall not be tipped in order to dispense fuel. The dispensing mechanism used to dispense fuel from the drums shall be stored in a waterproof container when not in use.

During fuel tanker delivery, the tanker driver must be present at all times during offloading of product. An emergency cut-off switch must be installed to immediately stop fuel delivery should an accident occur. An anti-flash nozzle must be installed at the end of the vent pipe with a fuel dispenser equipped with an automatic cut-off switch to prevent fuel tank overfills.

No smoking shall be allowed in the vicinity of the stores. Safety signage shall be provided in conformance with SABS 1186. The product contained within the tank shall be clearly identified using the emergency information system detailed in SABS 0232 part 1. Any electrical or petrol-driven pump shall be equipped and positioned, so as not to cause any danger of ignition of the product.

Areas for storage of fuels and other flammable materials shall comply with standard fire safety regulations and may require the approval of the Municipal Fire Prevention Officer.

The Business Partner shall ensure that there is adequate firefighting equipment at the fuel stores.

Where reasonably practical, vehicles and equipment shall be refuelled at a designated re-fuelling area. If it is not reasonably practical then the surface under the temporary refuelling area shall be protected against pollution and drip trays used to the reasonable satisfaction of the Engineer prior to any refuelling activities. The Business Partner shall ensure that there is always a supply of appropriate material readily available for the clean-up of minor hydrocarbon spills. The quantity of such materials shall be able to handle a minimum of 200 litres of hydrocarbon liquid spill. This material must be approved by the Engineer prior to any refuelling or maintenance activities.

Solid Waste Management (General and Hazardous)

The Business Partner shall be responsible for the establishment of a waste control system (Waste Management Plan) that is acceptable to the Engineer and ECO. The Business Partner shall keep detailed records of all waste removed from site, together with proof of recycling or legal disposal at a registered landfill site (disposal certificates).

The construction phase of the project will produce a variety of waste products. The largest portion of this will be the decommissioned and removed sections of the existing underground pipeline. The decommissioned steel pipeline would need to be removed from the site and either re-used at the mine, sold, recycled or disposed of at a licensed landfill area.

The initial solid waste generated on site would be cleared vegetation and soil from excavations from the pipeline trench and levelling and grading of the proposed laydown areas. Some building rubble would be produced throughout the construction phase from activities such as the construction of the reservoirs, pump houses, and buildings. Packaging material will be accumulated from unpacking of construction materials, infrastructure and equipment (i.e. pipelines, cement etc.).

Additional waste that will be generated would likely include:

- Wooden pallets and cartons;
- Scrap metal;
- Concrete waste;
- Paper and cardboard;
- Grey water - from ablutions; and
- Food wastes.

The following hazardous wastes could potentially be produced from construction activities:

- Oily rags and absorbents;

- Used oil and oil filters - from generators or vehicle maintenance;
- Contaminated water - slops and oily water from drip trays; and
- Sewage from toilets.

Wastes produced from project activities on site would be transferred to designated temporary storage areas and where necessary into secure containers. Solid wastes would be segregated to facilitate reuse and recycling of specific materials

All wastes that cannot be reused or recycled will be appropriately disposed of at the Black Mountain Mine (BMM) waste disposal sites. All construction debris shall be placed in appropriate on-site storage containers and periodically disposed of by a licensed waste Business Partner in accordance with applicable local and national regulations. Rubble generated during the construction phase should be removed from the site regularly and disposed of at a licensed landfill site.

All hazardous and liquid waste materials (e.g. fuel for generators, including any contaminated soils) shall be stored in an appropriately sized bunded area and disposed of by a licensed Business Partner at the Vissershok hazardous waste facility. Proof to be obtained from each Business Partner as to the final disposal location and volume of domestic and hazardous wastes.

In terms of the Atmospheric Pollution Prevention Act, burning of waste is not permitted as a disposal method.

Ablution Facilities

Latrine and ablution facilities and first-aid services shall comply with the regulations of the local authority concerned and shall be maintained in a clean and sanitary condition to the satisfaction of the Engineer.

The Business Partner shall provide suitable sanitary arrangements at the Business Partner's temporary laydown area and approved points along the designated work area to allow easy access for all employees on site. Staff are not permitted to commence with work on a site without suitable toilet facilities available for them.

Sanitary facilities shall be located within 100 m from any point of work, but not closer than 100 m to any waterbody. One chemical toilet is to be provided on site for every 10 contract personnel at each working area. These toilets must have doors and locks and shall be secured to prevent them blowing over.

The Business Partner shall ensure that suitable sanitation facilities are provided for on site.

The Business Partner shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from site. Discharge of waste from toilets into the environment and burial of waste is strictly prohibited.

The Business Partner shall keep the toilets in a clean, neat and hygienic condition. If the Business Partner fails to provide and/or maintain all site sanitation facilities in a clean and hygienic condition, the Engineer may order the Business Partner to suspend any or all work on the site until these requirements are met.

Eating Areas

The Business Partner shall designate eating areas to the approval of the Engineer, which shall be clearly demarcated and sufficient bins provided. Any cooking on site shall be done on well-maintained gas cookers with fire extinguishers present.

Drinking Water

The Business Partner shall ensure that drinking water is available for all staff on site. If no potable water source is available on site, then the Business Partner shall import drinking water for use by the Business Partner's employees.

Contaminated Water

Potential pollutants of any kind and in any form shall be kept, stored, and used in such a manner that any spills can be contained. Water containing pollutants such as cements, concrete, lime, chemicals, fuels and hydrocarbons shall be contained and discharged into an impermeable storage facility for removal from the site

or for recycling. This particularly applies to water emanating from concrete batching plants and concrete swills, and to runoff from fuel depots, workshops and truck washing areas.

Wash down areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas are not polluted. The Business Partner shall notify the Engineer immediately of any pollution incidents on site.

A MS shall be required for all wash areas where hydrocarbon and hazardous materials or other pollutants are expected to be used. This includes, but is not limited to, vehicle washing and workshop wash bays.

Hazardous Substances

Hazardous chemical substances (as defined in the Regulations for Hazardous Chemical Substances) used during construction shall be stored in secondary containers. The relevant Material Safety Data Sheets (MSDS) shall be available on site. Procedures detailed in the MSDS shall be followed in the event of an emergency situation.

If potentially hazardous substances are to be stored on site, the Business Partner shall provide a MS detailing the substances/materials to be used, together with the storage, handling and disposal procedures of the materials.

No paint products and chemical additives and cleaners such as thinners and turpentine, may be disposed of on site. Brush / roller washing facilities shall be established to the satisfaction of the Engineer. A MS, approved by the Engineer, is required for such washing activities.

Site Structures

All site establishment components (as well as equipment) shall be positioned to limit visual intrusion and the size of the area disturbed. The type and colour of roofing and cladding materials comprising the Business Partner's temporary structures shall be selected to reduce reflection.

Workshop, Equipment Maintenance and Storage

Where practical, all maintenance of plant on site shall be performed in a workshop. If it is necessary to do maintenance outside of the workshop area, the Business Partner shall obtain the approval of the Engineer prior to commencing activities.

When servicing equipment, drip trays shall be used to collect the waste oil and other lubricants. Drip trays shall also be provided in construction areas for stationary plant (such as compressors) and for "parked" plant (such as scrapers, loaders, vehicles).

All vehicles and equipment shall be kept in good working order and serviced regularly. Leaking equipment shall be repaired immediately or be removed from the site.

Noise

The Business Partner shall limit noise levels (e.g. install and maintain silencers on machinery). When working in any areas within audible distance of residents, and where practical, the Business Partner shall provide and use suitable and effective silencing devices for pneumatic tools and other plant that would otherwise cause a noise level exceeding 85 dB(A) during excavations and other work.

The Business Partner's attention is drawn to the Noise Regulations as promulgated in terms of the NEMA and relevant Local Authority bylaws.

Environmental Awareness Training

Environmental awareness training sessions shall be run for all personnel on site by the EO. A training procedure will need to be generated and implemented in this regard. Two types of courses shall be run, one for the Business Partner's and Business Partner's management and one for all site staff and labourers. The course material shall be approved by the ECO and RE. Courses shall be run during normal working hours at a suitable time and in a suitable venue provided by the Business Partner. All attendees shall remain for the duration of the course and sign an attendance register on completion that clearly indicates participant's names. A copy of the attendance register shall be handed to the Engineer.

All staff are to attend an initial training session and regular refresher sessions thereafter for the remainder of the contract (e.g. via toolbox talks). In addition, all new staff and sub-Business Partners' employees that spend more than one day a week or four days in a month on site, are to attend the environmental education session within one week of commencement of work on site. The Business Partner shall supply the RE with a monthly report indicating the number of employees that will be present on site during the following month and any changes in this number that may occur during the month.

No more than 30 people shall attend each course and the cost, venue and logistics for these courses shall be for the Business Partner. The EO shall keep a register of all personnel attending the environmental awareness training sessions.

Notwithstanding the specific provisions of this clause, it is incumbent upon the Business Partner to convey the sentiments of the EMPr to all personnel involved with the works.

Fire Control

No fires may be lit on site. Any fires which occur shall be reported to the Engineer immediately and managed in terms of the Emergency Preparedness and Response Plan. Smoking shall not be permitted in those areas where it is a fire hazard. Such areas shall include the workshop and fuel storage areas and any areas where the vegetation or other material presents a fire hazard.

The Business Partner shall appoint a Fire Officer who shall be responsible for ensuring immediate and appropriate actions in the event of a fire and shall ensure that employees are aware of the procedure to be followed. The Business Partner shall forward the name of the Fire Officer to the Engineer for his approval seven days prior to the date of the environmental awareness training course.

The Business Partner shall ensure that there is basic firefighting equipment available on site at all times.

Concrete and Cement Work

The location of the batching area (including the location of cement stores and sand and aggregate stockpiles) shall be indicated on the site layout plan and approved by the ECO. A MS indicating the layout and preparation of this facility is required.

Cement is to be stored in a secure weatherproof location to avoid contamination of the environment. Cement will not be stored within 100 m of any waterbody.

All runoff from batching areas shall be strictly controlled so that contaminated water does not enter storm water or groundwater. Plastering boards and mixing trays should be used at all mixing and supply points. Cleaning of equipment and flushing of mixers shall not result in pollution of the surrounding environment.

Suitable screening and containment shall be in place to prevent windblown contamination associated with bulk cement silos, loading and batching.

All visible remains of excess concrete shall be physically removed to an approved waste site and disposed of on completion of the plaster or concrete pour section.

Emergency Procedures

The Business Partner shall submit MSs covering the procedures for the following emergencies:

Fire:

The Business Partner will maintain a robust fire protection system. The Business Partner shall advise the relevant authority or fire response team of a fire as soon as one starts and shall not wait until it can no longer be controlled. The Business Partner shall ensure that his employees are aware of the procedure to be followed in the event of a fire.

Accidental leaks and spillages

The Business Partner shall ensure that his employees are aware of the procedure to be followed for dealing with spills and leaks, which shall include notifying the RE and ECO. The Business Partner shall ensure that the necessary materials and equipment for dealing with spills and leaks is available on site at all times. Treatment and remediation of the spill areas shall be undertaken to the reasonable satisfaction of the Engineer. In the event of a hydrocarbon spill, the source of the spillage shall be isolated and the spillage contained. The area shall be cordoned off and secured until such time as the spill has been cleaned up and the hazardous waste sent for disposal.

Safety

The Business Partner shall at all times observe proper and adequate safety precautions on the site. Telephone numbers of emergency services, including the local BMM firefighting service, shall be posted conspicuously in the Business Partner's office near the telephone.

No unauthorised firearms are permitted on site.

The Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) must be complied with.

Security

With the possible exception of any security staff who may be required to be present overnight at the Business Partner's laydown area, no personnel will be permitted to live on site. Security staff must be provided with heating and cooking facilities (in order that they do not need to light fires), and access to toilet facilities, waste management and communication equipment.

Any security lighting at the Business Partner's laydown area is to be placed in such a way as to not cause a nuisance to residents of the area and traffic on adjacent roads.

Community Relations

The Business Partner shall erect and maintain information boards which shall include contact details for complaints by members of the public in accordance with details provided by the Engineer.

All interactions with the surrounding community shall be undertaken in terms of the Community Engagement Plan developed by Sedibeng Water.

The Business Partner shall keep a "Grievance Register" on site. The Register shall contain all contact details of the person who made the complaint and information regarding the complaint itself. All grievances raised shall be dealt with in accordance with the Sedibeng Water's Grievance Procedure which is to be developed.

Protection of Natural Features

The Business Partner shall not deface, paint, damage or mark any natural features (e.g. rock formations) situated in or around the site for survey or other purposes unless agreed beforehand with the Engineer. Any features affected by the Business Partner in contravention of this clause shall be restored/ rehabilitated to the satisfaction of the Engineer.

The Business Partner shall not permit his employees to make use of any natural water sources (e.g. springs, streams and open water bodies) for the purposes of swimming, personal washing and / or the washing of machinery or clothes.

Working Hours

Working hours in terms of the planning approval shall be adhered to. If works are to take place outside of normal working hours, the ECO and the Engineer are to be notified and disturbance to the surrounding residents or land users is to be prevented. The Engineer will, where required, in turn notify applicable authorities of work done outside of normal working hours.

Excavation and Trenching

During excavation and trenching activities, care is to be taken to ensure that the stockpiling of topsoil is kept separate from sub-soils. Topsoil is to be replaced as topsoil and is to be the final layer when back-filling. The Business Partner shall reinstate all working areas to the satisfaction of the Engineer.

Areas opened for trenching should be restricted to the minimum required to be worked in and closed up as quickly as possible following the removal of the existing pipeline and replacement with the new pipeline, in order to prevent them from posing safety hazards to people, traffic and livestock/animals and to prevent rainwater erosion. Daily inspection of trenches must be conducted by the EO to inspect if any animals are trapped in trenches, and if any are discovered, these animals need to be removed by qualified snake handler or appropriately trained specialist after a Risk Assessment has been conducted. Proper record keeping regarding any animal mortalities and/or translocation must be kept and reported to the ECO on a weekly basis. Trenches shall be re-filled to the same level as (or slightly higher, to allow for settlement) the surrounding land surface to minimise erosion. Excess soil shall be stockpiled in an appropriate manner. No stockpiling must occur within 100 m of a water course with the exception of where the trenches approach and cross water courses.

In the event of material removed during trenching being excessive after backfilling or being unsuitable as overburden, the excess material must be removed and disposed from the construction site to a site agreed upon by the Engineer and, where applicable, the Local Authority.

Temporary Site Closure

If the Site is closed for a period exceeding one week, a checklist procedure shall be carried out prior to and post closure by the Business Partner in consultation with the ECO. Business Partner's Safety Officers (in terms of the Occupational Health and Safety Act) are to check the site and report to the Engineer regarding the following:

Fuels/ flammables / hazardous materials stores:

- Ensure fuel stores are as low in volume as possible;
- No leaks;
- Outlet secure / locked;
- Bund empty;
- Fire extinguisher serviced and accessible;
- Secure area from accidental damage, e.g. vehicle collision;
- Emergency and Management telephone numbers to be available and displayed; and
- Adequate ventilation.

Other:

- All trenches and manholes secured;
- Fencing and barriers in place as per the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993);
- Notice boards applicable and secured;
- Security persons briefed and have facility for contact;
- Night hazards checked, e.g. reflectors, lighting, traffic signage;
- Fire hazards identified – local authority notified of any potential threats, e.g. large brush stockpiles, fuels etc.;
- Pipe stockpile wedged/secured;
- Scaffolds secure; and

- Inspection schedule and log by security or contracts staff.

The ECO is to check and report to the Engineer regarding the following issues:

- Wind and dust mitigation in place, e.g. straw, brush packs, irrigation;
- Slopes and stockpiles at stable angle;
- Landscape areas watering schedules and supply secured;
- Fuels/hazardous substances stores secure;
- Cement and materials stores secured;
- Toilets empty and secured;
- Refuse bins empty and lids secured;
- Bunding clean and treated;
- Drip trays empty and secure; and
- Structures vulnerable to high winds secure.

The Business Partner is to ensure that all temporary closure requirements are met before leaving the site.

5.2.4 Construction Phase Actions and Outcomes

In order to ensure compliance with environmental legislation, the following actions are applicable to the construction phase for the water infrastructure upgrades. The persons responsible for implementation of the actions are listed in [Table 5-2](#), the majority of which are the responsibility of the appointed Business Partner.

These activities are described in more detail in [Table 5-2](#).

Table 5-2: Environmental Management Programme Applicable to the Construction Phase

Aspect		Objective/ Outcome	Mitigation		Responsibility	Parameters for Monitoring	Timing
#	Description of Aspect		#	Management Action			
1.	Compliance with EMPr and EA	Confirm Sedibeng Water commitment to adherence to EMPr and Business Partner Compliance Standards	1.1	Ensure that the EMPr, Business Partner Compliance Standards and EA are available at the site throughout construction and implemented by the contactor.	Sedibeng Water/ ECO	Copy of signed EMPr and EA with Business Partner	Prior to construction and ongoing throughout construction
		Auditing of compliance with EMPr and EA	1.2	An audit shall be undertaken by an independent auditor at the end of the construction phase, and a report shall be submitted to NCDENC. The audit report shall indicate the date of the audit, name of auditor, and outcome of audit in terms of compliance with the environmental authorisation and conditions of the EMPr.	Sedibeng Water/ RE/ ECO	Audit report and proof of submission to NCDENC	Upon completion of construction
2.	Health and Safety	Ensure the health and safety of Business Partners and site users	2.1	Adhere to the Health and Safety Plan to avoid work related accidents.	RE/ ECO	Signed Health and Safety Plan	Throughout construction
			2.2	Appropriate Personal Protective Equipment (PPE) must be worn by all construction personnel. This shall include the use of ear protection in areas where the 8-hour ambient noise levels exceed 75dBA.	RE/ ECO	Signed Health and Safety Plan, Visual inspections	Throughout construction
			2.3	Audit the implementation of measures outlined in all health and safety related management plans.	RE/ ECO	Health and Safety Audit reports	Bi-annual audits
3.	Dust and other air emissions	Limit fugitive dust and exhaust emissions	3.1	Limit the disturbance of land to what is absolutely necessary.	RE/ Business Partner/ ECO	Weekly ECO Report	Throughout construction
			3.2	Construction related vehicles travelling on gravel roads should not exceed a speed of 40 km/hr.	Business Partner / ECO	Daily visual inspections	
			3.3	Overburden spoil or dusty materials shall be kept moist to reduce dust. Where practical dust screen will be installed for long term stockpiles.	Business Partner / ECO	Grievance procedure	
			3.4	Dust suppression on areas where there is significant vehicle movement and dust generating activities should be implemented through the use of chemical binding agents and/or water sprays.	Business Partner / ECO		
			3.5	Any generators and vehicles/equipment will be operated and maintained according to supplier specification.	Business Partner / ECO		
			3.6	Concurrent rehabilitation and re-vegetation of all areas are to be undertaken as construction activities are completed in accordance with the Rehabilitation Plan.	Business Partner / ECO		
			3.7	Material loads shall be suitably covered during transportation. Where this is not practical (e.g. hauling material), the Business Partner shall ensure that construction vehicles are not overfilled.	Business Partner / ECO		

Aspect		Objective/ Outcome	Mitigation		Responsibility	Parameters for Monitoring	Timing
			3.8	Implementation of a grievance procedure whereby air quality issues can be raised/ reported and transparently and timeously addressed.	Business Partner / ECO		
4.	Noise pollution	Minimise noise nuisance on surrounding receptors	4.1	The noise-generating construction activities should be restricted to normal working hours, between 07h00 and 18h00.	RE/ ECO	Visual inspections	Throughout construction
			4.2	Adjacent landowners should be notified of commencement of construction activities and expected timeframes for activities that would result in significant noise generation.	RE/ ECO	Proof of notification	
			4.3	Construction laydown areas, concrete batching plants, and other noisy fixed facilities should be located well away from noise sensitive areas (as per 11.1 in Table 5-1).	RE/ ECO	Site layout plan Visual inspections	
			4.4	Ensure that municipal regulations relating to noise generation are observed.	RE/ ECO	Health & Safety Plan	
			4.5	Truck traffic shall be confined to existing roads.	RE/ ECO	Traffic Management Plan Visual inspection	
			4.6	All vehicles and equipment shall be maintained according to suppliers' specifications to limit noise emissions.	RE/ ECO	Service records	
			4.7	It must be ensured that employees' and Business Partners' working conditions comply with the requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) (OHS Act). Where necessary, workers must be required to wear ear protection equipment.	RE/ ECO	Health & Safety Plan	
			4.8	The new abstraction pumps and booster pumps are to incorporate all the necessary noise control measures required in order that the overall noise level from the new installations comply with SANS 10103 and any relevant noise control regulations.	Engineer/ ECO	Pump specifications	
			4.9	Implement a grievance procedure whereby noise related issues can be raised/ and reported and transparently and timeously addressed.	RE/ ECO	Grievance Procedure	
5	Traffic Impact	Minimise impacts due to traffic	5.1	Ensure that construction activities are staggered and vehicular activities kept to a minimum, during daylight hours and, as far as possible, outside of peak traffic times.	Business Partner/ RE/ ECO	Traffic Management Plan	Throughout construction
			5.2	The Business Partner should ensure that one lane of the road remains open when constructing underground sections of piping across roads.	Business Partner/ Engineer/ ECO	Traffic Management Plan	
			5.3	Appropriate routes for heavy vehicle and machinery movement must be identified and agreed with the local roads authorities (and landowners) with the aim to ensure that trucks transporting abnormal loads (i.e. pipelines) avoid residential areas and use the strategic highway network wherever possible. Heavy vehicles shall use the pipeline servitude road for transport and avoid the town of Pella.	Business Partner/ Engineer/ ECO	Traffic Management Plan	
			5.4	Undertake driver awareness training, use of traffic warning signs and ensure adherence to speed limits.	Business Partner/ RE/ ECO	Proof of driver awareness training	

Aspect		Objective/ Outcome	Mitigation		Responsibility	Parameters for Monitoring	Timing
			5.5	All Business Partners shall be required to minimise the use of private cars and vans when travelling to the site and to maximise the use of company-provided or public transport, shared vans and non-motorised modes of transport, where viable.	Business Partner/ RE/ ECO	Traffic Management Plan	
			5.6	If a person or animal is injured by transport activities this must be handled in accordance with Sedibeng Water's Emergency Response Procedure.	Business Partner/ RE/ ECO	Traffic Management Plan	
			5.7	Implement of a grievance procedure whereby traffic related issues can be raised/ and reported and transparently and timeously addressed.	RE/ ECO	Grievance Procedure	
6.	Damage or Destruction of Cultural Heritage Interests (Palaeontology, Archaeology and Cultural Heritage)	Minimise damage to cultural heritage	6.1	If any human remains are uncovered during construction activities, work should stop in that area and the South African Heritage Resources Agency (SAHRA) Burials Unit and SAPS should be notified. No further activities may be carried out in that area until SAHRA has given feedback.	RE/ Engineer/ ECO	ECO Report & SAHRA response	Prior to and throughout construction
			6.2	If during construction any possible heritage finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operation shall be stopped and a qualified archaeologist or palaeontologist contacted for an assessment of the find. A Chance Find Procedure shall be implemented (6.3)	RE/ Engineer/ ECO	ECO Report & SAHRA response	
			6.3	A Chance Find Procedure shall be developed and implemented and shall apply to the developer's permanent employees, its subsidiaries, Business Partners and Business Partners, and service providers. Construction crews shall be properly inducted to ensure they are fully aware of the procedures regarding chance finds.	RE/ Engineer/ ECO	Proof of Chance Find Procedure on site	
			6.4	The Chance Find Procedure shall include: <ul style="list-style-type: none"> Work must cease at the site of the find if during the pre-construction phase, construction, operational or closure phases of this project, any person employed by the developer, one of its subsidiaries, Business Partners and Business Partners, or service provider, finds any artefact of potential cultural significance or fossil material, and must be reported to their immediate supervisor, and through their supervisor to the senior on-site manager. The senior on-site manager shall make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area. The senior on-site manager shall inform the Environmental Control Officer (ECO) of the find and its immediate impact on operations. The ECO shall then contact a professional archaeologist or palaeontologist for an assessment of the finds who will notify the SAHRA. 	Sedibeng Water/ Engineer/ ECO	Proof of Chance Find Procedure on site	
			6.5	Implement the grievance procedure whereby cultural heritage related issues can be raised/ and reported and transparently and timeously addressed.	RE/ ECO	Grievance Procedure	
7.	Waste generation and disposal	Minimise waste generation and disposal	7.1	The WMP shall be implemented for the management of all waste during the construction phase.	Business Partner/ ECO	Proof of WMP on site	Throughout construction

Aspect		Objective/ Outcome	Mitigation	Responsibility	Parameters for Monitoring	Timing	
			7.2	Wastes produced from project activities on site shall be transferred to designated temporary storage areas and where required into secure, sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility.	Business Partner/ ECO	Visual inspection Proof of disposal	Throughout construction
			7.3	On -site refuse bins must be emptied and secured on a regular basis. Maximum domestic waste storage period shall be 10 days.	Business Partner/ ECO	Proof of disposal	Every 10 days throughout construction
			7.4	Under no circumstances shall domestic waste be burned on site.	Business Partner/ ECO	Visual inspection	Throughout construction
			7.5	Solid wastes including rubble and construction debris shall be segregated to facilitate reuse and recycling of specific materials.	Business Partner/ ECO	Visual inspection	Throughout construction
			7.6	All wastes that cannot be reused or recycled shall be collected by approved waste Business Partners and transferred to the Black Mountain Mine waste site (a registered landfill site).	Business Partner/ ECO	Proof of disposal	Throughout construction
			7.7	Effluent from the washing-down of concrete mixing and handling equipment will be contained within a bunded area sized to contain 110% of the volume generated and allowed to dry. This effluent shall then be disposed of at a proper containment facility.	Business Partner/ ECO	Record of safe disposal	Throughout construction
			7.8	All hazardous and liquid waste materials (e.g. fuel for generators, including any contaminated soils) will be stored in an appropriately sized bunded area (110% of the volume) and disposed of by a licensed Business Partner at a licensed hazardous waste facility. Hydrocarbon contaminated soil will be treated at the BMM contaminated soil facility. Business Partner as	Business Partner/ ECO	Record of safe disposal	Throughout construction
			7.9	Trucks and construction vehicles shall be serviced off-site at workshops to minimise waste generation on site.	Business Partner/ ECO	Proof of servicing	Throughout construction
			7.10	The construction Business Partner shall remove refuse collected from the designated waste storage areas at least every 10 days.	Business Partner/ ECO	Proof of disposal	Throughout construction
			7.11	Good housekeeping practices shall be implemented at all construction areas.	Business Partner/ ECO	Visual Inspections ECO Report	Throughout construction
			7.12	Implement a grievance procedure whereby waste related issues can be raised/ reported and transparently and timeously addressed.	RE/ ECO	Grievance Procedure	Prior to construction and throughout construction phase
			8.	Visual Impacts	Minimise visual impact	8.1	As per Section 11.1 in Table 5-1 all construction activities shall remain within the demarcated areas.
			8.2	Signage related to the enterprise shall be discrete and confined to the entrance gates. No other corporate or advertising signage, particularly billboards or flags, to be permitted.	Sedibeng Water/ Business Partner/ ECO	Visual Inspection	Throughout construction
			8.3	The material stores and lay-down area shall be kept tidy.	Business Partner/ ECO	Visual inspection	Throughout construction

Aspect		Objective/ Outcome	Mitigation	Responsibility	Parameters for Monitoring	Timing	
					Grievance procedure		
			8.4	Concurrent rehabilitation and re-vegetation of all areas shall be undertaken as construction activities are completed.	Business Partner / ECO/ Biodiversity specialist	Rehabilitation Plan	Throughout construction
			8.5	All yards and storage areas to be enclosed by screens or fences, as appropriate.	Sedibeng Water	Visual inspection	Prior to construction
			8.6	External lighting should be confined to the laydown areas. Where lighting is required at night for security purposes, low-UV type lights (such as most LEDs), which do not attract insects, must be used .	Sedibeng Water	Visual inspection	Prior to construction
9.	Local economy	Enhance employment procurement opportunities local and	9.1	Implement a structured stakeholder engagement programme so that communities are aware of local employment requirements and opportunities that are available. Where required, the local resident status of applicants should be verified in consultation with community representatives and municipal structures.	Sedibeng Water/ Business Partner	Recruitment Procedure Proof of stakeholder engagement programme Keep a record of all local numbers and names employed	Throughout construction
			9.2	Clearly advertise the nature and numbers of jobs available during the project phases in surrounding communities, and ensure that communities understand the Project's local recruitment procedures. It is advised that eligibility criteria be informed by local authorities, and clearly communicated to any potential beneficiaries.	Sedibeng Water/ Business Partner	Proof of advertisements of	Throughout construction
			9.3	Recruitment shall be coordinated through local offices set up in Pofadder for recruitment from local communities. If this is not feasible, locate the recruitment offices at a central point (but not on-site) to control access and movement of jobseekers. A recruitment registry should be created for jobseekers to record relevant qualifications, work experience and contact details.	Sedibeng Water/ Business Partner	Proof of recruitment procedures implemented	Throughout construction
			9.4	Women and youth should receive preferential employment opportunities in the company recruitment policy, as far as possible. Performance indicators for promoting the employment of women and youth should be developed and implemented by the Project and Business Partners. .	Sedibeng Water/ Business Partner	Proof of recruitment procedures implemented Performance indicators available on site	Throughout construction
			9.5	Sedibeng Water should work closely with the relevant local authorities, community representatives and NGOs to ensure that the use of local labour is maximised.	Sedibeng Water/ Business Partner	Proof of database on site Proof of engagements undertaken	Throughout construction

Aspect		Objective/ Outcome	Mitigation		Responsibility	Parameters for Monitoring	Timing
			9.6	The Developer should share skills registers with other construction or infrastructure development companies in the regional study area to assist in finding employment once the construction phase is completed.	Sedibeng Water/ Business Partner	Proof of skill sharing undertaken	Throughout construction
			9.7	The unbundling of tenders to provide appropriate opportunities for local service providers should be considered, where possible.	Sedibeng Water/ Business Partner	Proof of use of local suppliers	Throughout construction
			9.8	Tender criteria shall require Business Partners and sub-Business Partners to provide training and skills development to the locally recruited workforce. Where possible, training should be aimed at providing skills to employees that might allow them to apply for any permanent positions that become available once construction is complete, or at the proposed Gamsberg Smelter Project.	Sedibeng Water/ Business Partner	Proof of training and skills development of local workforce	Throughout construction
			9.9	Provide employees with reference letters and certificates of completion for on-the-job training that they can submit to gain further employment.	Sedibeng Water/ Business Partner	Proof of provision of certificates and/ or letters of reference	Throughout construction
10.	Impact on Aquatic Habitat	Minimise impacts on aquatic habitat	10.1	All construction activity shall take place within the demarcated areas as per Section 11.1 of Table 5-1 ..	Engineer/ Business Partner/ EO	Site plan	Throughout construction
			10.2	The footprint area of the pipeline must be kept to a minimum. The footprint area must be clearly demarcated on the ground and on all layout maps to avoid unnecessary disturbances to adjacent areas. Concrete mixing shall be undertaken on an impermeable surface to prevent contamination of soils and more than 100m away from any identified watercourse, wetland or drainage line.	Business Partner/ EO	Visual inspection EO Reports	Throughout construction
			10.3	Install pipeline trenches to minimise sandy bedding material generating preferential flow pathways for water across the project area perpendicular to the general direction of flow.	RE/ Business Partner/ EO	Proof of installation Visual inspection Photographs	Throughout construction
			10.4	After burial of the pipeline, trenches shall be re-filled to the same level as (or slightly higher, to allow for settlement) the surrounding land surface to minimise erosion. Pipelines should be buried at a sufficient depth the assist with final contouring.	Business Partner/ EO/ Specialist	Proof of final contouring, sign off by Engineer	Throughout construction
			10.5	Construction vehicles and machinery shall make use of existing access routes as far as possible, before adjacent areas are considered for access. No uncontrolled access through watercourses to be allowed.	Business Partner/ EO	Visual inspection EO Report	Throughout construction
			10.6	Construction within the watercourses shall take place during the dry season to reduce the erosion potential of the exposed surfaces; as well as guarantee dry watercourses. Should there be significant rainfall additional measures must be implemented and should be supervised by an aquatic ecologist.	Engineer/ Business Partner/ EO/ Aquatic Ecologist	Visual inspection Photographs Report by Aquatic Ecologist if required	Throughout construction
			10.7	Stockpiling of soil and other material should take place a minimum of 100 m from any watercourse.	Business Partner/ EO	Visual inspection EO Report	Throughout construction

Aspect		Objective/ Outcome	Mitigation		Responsibility	Parameters for Monitoring	Timing
			10.8	If required, erosion and sedimentation controls e.g. gabions and Reno mattresses must be installed to (minimise erosion and sedimentation into drainage channels. An aquatic and wetland specialist shall be required to give input in this regard.	Business Partner/EO	Visual inspection EO Report Input from aquatic and wetland specialist	Throughout construction
			10.9	A Soil Management Plan shall be developed and implemented to include the procedures for excavation, soil stockpiling and back-filling of trenches.	Business Partner/EO	Visual inspection Soil Management Plan on-site	Throughout construction
			10.10	Concurrent rehabilitation and re-vegetation of all areas is to be undertaken as construction activities are completed. The Rehabilitation Plan should include: <ul style="list-style-type: none"> Bank reprofiling where the bank material allows for this, in drainage line areas prone to erosion, especially around pipeline infrastructure. This would involve a gentler gradient (ideally 35 degrees) to assist in reducing flow energy and erodibility, while allowing indigenous vegetation to establish in these areas. Large rocks sourced from the project area should be strategically placed in key areas to prevent erosion. Placement of these rocks needs to be planned as flows in major drainage lines can remove these if not properly placed. 	Business Partner / ECO	Visual inspection EO Report	Throughout construction
			10.11	A Water Course Rehabilitation Plan shall be developed by a wetland and aquatic specialist.	Business Partner/ECO/Aquatic Specialist	Proof of Water Course Rehabilitation Plan on-site	Throughout construction
11.	Impact on downstream water quality	Minimise impact on downstream water quality	11.1	Spill kits shall be available to ensure that any fuel or oil spills are contained and cleaned up immediately. Contaminated material and / or soil shall be collected and stored in a bunded area until future disposal/bioremediation, or removed from site.	Business Partner/EO	Visual inspection EO Report Incident Reports	Throughout construction
			11.2	All chemicals toxins to be used for the pipeline construction shall be stored a minimum of 100 m from drainage channels and in a bunded area.	Business Partner/EO	Visual inspection EO Report	Throughout construction
			11.3	Material Safety Data Sheets for all applicable materials stored on site must be readily available to on site personnel.	Business Partner/EO	Visual inspection EO Report	Throughout construction
			11.4	All machinery and equipment should be inspected regularly for faults and possible leaks. These should be serviced off-site. All plant, construction equipment, vehicles or other items shall be stored within the specified laydown areas, unless prior arrangements have been made with the Engineer or EO.	Engineer/ Business Partner/EO	Visual inspection Proof of servicing	Throughout construction

Aspect		Objective/ Outcome	Mitigation	Responsibility	Parameters for Monitoring	Timing
			11.5 Adequate sanitary facilities and ablutions shall be provided for all personnel throughout the project area. Use of these facilities shall be enforced. These facilities shall be kept clean and serviced regularly.	Business Partner/EO	Visual inspection Proof of servicing	Throughout construction
			11.5 The Waste Management Plan must be implemented to minimise potential waste washing into the aquatic systems.	Business Partner/EO	Visual inspection EO Report	Throughout construction
			11.6 Concrete mixing shall be undertaken on an impermeable surface a minimum of 100 m from a watercourse to prevent contamination of soils and run-off.	Business Partner/EO	Visual inspection EO Report	Throughout construction
			11.7 Effluent from the washing-down of concrete mixing and handling equipment will be contained within a bunded area sized to contain 110% of the volume generated and allowed to dry. This effluent shall then be disposed of at a proper containment facility.	Business Partner/EO	Visual inspection Record of disposal	Throughout construction
			11.8 Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.	Business Partner/EO	Visual inspection EO Report	Throughout construction
			11.9 All fuel, oil and other hazardous substances (i.e., degreasers, paint cleaners, poisons, etc.) shall be confined to demarcated, bunded areas (to contain 110% of the stored volume) within the laydown areas and stored in suitable containers / storage facilities.	Business Partner/EO	Visual inspection EO Report	Throughout construction
			11.10 The storage of any hazardous materials shall not take place within 100 m of a watercourse, stream, drainage line or wetland.	Business Partner/EO	Visual inspection EO Report	Throughout construction
			11.11 No refuelling shall be undertaken within 100 m of any watercourse, stream, drainage line or wetland.	Business Partner/EO	Visual inspection EO Report Incident Reports	Throughout construction
			11.12 All plant and equipment working in watercourse areas must be checked on a daily basis for leaks.	Business Partner/EO	Visual inspection EO Report Incident Reports	Throughout construction
12.	Impact on Flora	Minimise the impact on sensitive flora	12.1 Screening of all development areas by the ECO or any external ecologist/botanist is required to screen and identify any threatened or protected species as listed by the NEM:BA (2004) and the NCNCA (2009) and any protected trees as listed by the NFA (1998). Should any species be recorded, the relevant permits must be applied for from the NCDENC and the Northern Cape DAFF and once permits are approved plants needs to be translocated. Clearing of vegetation must be minimized and avoided as far as possible. As per Section 11.1 in Table 5-1 project area footprints must be demarcated to ensure no person/vehicle goes into adjacent areas.	Business Partner/EO	Visual inspection Site plan	Throughout construction

Aspect		Objective/ Outcome	Mitigation	Responsibility	Parameters for Monitoring	Timing
			<p>Construction vehicles shall be restricted to existing roads and new pathways must be restricted.</p> <p>Compilation of a Search and Rescue Protocol needs to be in place prior to commencement of translocation of threatened or protected species and/or protected tree species. Such a Search and Rescue Protocol shall include a monitoring programme.</p> <p>Translocated species can be translocated to the BMM-Gamsberg nursery for storage, care and maintenance and seed collection as per BMM Search and Rescue Protocol and Nursery Management plan.</p> <p>All vegetation to be cleared shall require a clearance permit issued by the EO/ECO or specialist</p>			
			12.2 Where topsoil is removed from areas cleared of vegetation, it shall be retained for future landscaping use. Topsoil should exclude litter, building rubble, alien plant material or any other waste. All topsoil, and specifically any topsoil from areas which are likely to contain bulbs, must be stripped and stockpiled for re-use in landscaped areas. This will constitute at least a 500 mm layer.	Business Partner/EO	Visual inspection Photographs Site plan	Throughout construction
			12.3 Subsoil shall be stockpiled and maintained separately from the topsoil so that neither stockpile is contaminated by the other.	Engineer/ EO	Visual inspection Photographs Site plan	Throughout construction
			<p>12.4 Topsoil storage should be included in the Soil Management Plan and should include:</p> <ul style="list-style-type: none"> • Topsoil shall be stored in areas demarcated by the EO and Engineer and in piles not higher than 2 m; • Topsoil may not be removed from site, or used for any purpose other than in the final landscaping of the site; • Stockpiles shall not be compacted or disturbed; • Stockpiles shall be domed at the top to promote runoff; • The period between the stockpiling of topsoil and its utilization shall be as short as possible; and • Ideally the topsoil should be transferred to its intended site of use immediately following site clearance and stockpiling to avoid double handling. 	Engineer/ EO	Visual inspection Site plan EO Report	Throughout construction
			12.5 Indigenous vegetative material should be kept on site, mulched and spread over the disturbed areas to enhance rehabilitation of the natural vegetation.	Business Partner/EO	Visual inspection EO Report	Throughout construction
			12.6 An Alien Invasive Plant Species Management Plan needs to be compiled and implemented during the construction phase to control and prevent the growth and spreading of alien invader plant species of invasive plants on cleared areas and stockpiles.	Business Partner/EO	Visual inspection Alien Invasive Plant Management Plan EO Report	Throughout construction
			12.7 No fires should be allowed on-site.	Business Partner/EO	Visual inspection	Throughout construction

Aspect		Objective/ Outcome	Mitigation	Responsibility	Parameters for Monitoring	Timing
					EO Report	
			12.8 Smoking is not allowed on-site, other than at designated smoking points which are clearly marked as such. Cigarette butts shall not be discarded on the ground.	Business Partner/EO	Visual inspection EO Report	Throughout construction
			12.9 No vegetation of any kind may be collected from areas surrounding the site by any person employed for the Project.	Business Partner/EO	Visual inspection EO Report	Throughout construction
			12.10 No dogs or other domestic pets are allowed on-site.	Business Partner/EO	Visual inspection EO Report	Throughout construction
			12.11 A Rehabilitation Plan shall be compiled for the project and is to be implemented from the onset of the activities. The plan must: <ul style="list-style-type: none"> • Provide guidelines on how to restore the disturbed area to (as close as possible to) its natural state. The plan must also include the incorporation of natural vegetation, sloping plans as well as storm water management. • Rehabilitation of the disturbed areas existing in the project area must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type. Plant species translocated to BMM nursery in Aggeneys shall be used during rehabilitation process and species translocated shall be replanted as far as practically possible to the same location that it was removed from depending on site conditions after disturbance. • Any succulents in the footprint of the area to be disturbed must be identified and removed from the proposed areas of disturbance prior to construction and relocated. • Areas must be stabilised using appropriate indigenous vegetation (along the length of the pipeline) and geotextile matting (in areas with a gradient exceeding 20°).. Indigenous grasses and shrubs found within the project area and surrounds would sustain the arid environment and are the preferred options. During the first year of establishment, these plants should be watered as often as possible to ensure their establishment. The first two to three weeks should be daily, thereafter weekly is recommended. This is subject to how the vegetation fairs during this time, and should be adapted accordingly. 	Business Partner/EO/ Biodiversity Specialist	Rehabilitation Plan Visual inspection	Throughout construction and a minimum of a year after establishment
			12.12 A monitoring programme/ protocol for the translocated species must be developed and implemented to include the recording of mortalities and survival rates as well as the success of the rehabilitation programme.	Business Partner/EO/ Biodiversity Specialist	Monitoring Programme Records of monitoring	Prior to and throughout construction and a minimum of a year after establishment

Aspect		Objective/ Outcome	Mitigation		Responsibility	Parameters for Monitoring	Timing
				Erosion management and monitoring protocol to be developed prior to construction		Visual inspection	
13.	Impact on Fauna	Minimise impacts on fauna and avifauna	13.1	Construction vehicles shall be restricted to existing roads and new pathways must be restricted. Indicated speed limits on public roads must be adhered to.	Business Partner/EO	Visual inspection EO Report	Throughout construction
			13.2	Schedule project activities, as far as possible, outside of potential migration, nesting and breeding seasons (largely during spring) of species of conservation concern (SCC).	Engineer/ Business Partner/ EO	Construction schedule signed off by Engineer	Throughout construction
			13.3	Construction activities at night shall be prohibited, as far as possible, in order to reduce the impact on faunal species.	Business Partner/EO	Visual inspection EO Report	Throughout construction
			13.4	Prior to and during vegetation clearance any larger fauna species noted should be given the opportunity to move away from the construction machinery.	Business Partner/EO	Visual inspection EO Report	Throughout construction
			13.5	A qualified ecologist should be on site when species that will be directly disturbed which need to be relocated i.e. fauna (including nests of SCCs) are found during the project activities. Daily inspection of trenches needs to be conducted and any faunal species trapped in trenches shall be relocated by a qualified ecologist. In the case of snakes, a trained snake handler needs to be appointed onsite. Training of employees onsite can also be considered by registered snake handler companies. Records of faunal species translocation and/or faunal mortalities must be kept on a daily basis and weekly translocating and mortalities shall be reported to the ECO for record keeping.	Business Partner/EO/ Qualified Ecologist	Proof of EO on site Daily EO records Proof of reports of the ECO	Throughout construction
			13.6	No trapping, killing or poisoning of any wildlife is to be allowed on site, including snakes, birds, lizards, frogs, insects or mammals.	Business Partner/EO	Visual inspection EO Report	Throughout construction
			13.7	The feeding of any wild animals is prohibited.	Business Partner/EO	Visual inspection EO Report	Throughout construction

5.3 OPERATIONAL PHASE ENVIRONMENTAL MANAGEMENT PLAN

5.3.1 Introduction

This Operational EMPr (OEMPr) covers the requirements for controlling the impact on the environment of operational activities. This OEMPr aims to provide Sedibeng Water with the necessary tools to ensure that the potential impacts on the environment during the operation and maintenance of the infrastructure are minimised. It also aims to ensure that the infrastructure is operated and maintained according to Good Practice.

The OEMPr is a working document that may be amended to enhance its effectiveness for environmental control.

5.3.2 Application

The application and implementation of the OEMPr shall be the responsibility of Sedibeng Water. Sedibeng Water is to designate an Environmental Site Officer (ESO) to ensure that relevant requirements of the OEMPr are implemented, and that the site is suitably managed. Sedibeng Water may appoint a suitably qualified and experienced person from within the existing staff to fulfil the role of ESO.

Should Sedibeng Water sub-contract the running of the water infrastructure to a third party, the OEMPr must be part of the contract and must be binding.

The roles and responsibilities of each of the above-mentioned environmental management bodies have been detailed below:

Environmental Site Officer

A suitably qualified and trained individual appointed by Sedibeng Water prior to the operational phase of the project, will fulfil the role of the Environmental Site Officer (ESO). The primary roles and responsibilities of the ESO will be:

- To oversee the implementation of the OEMPr on site in accordance with the OEMPr and Sedibeng Waters' internal environmental management systems;
- To visit the site on a monthly basis (or as required) and advise on areas of environmental management, or compliance with the OEMPr requiring attention;
- To visit the site more regularly during the first three months of operation, during which more frequent monitoring may be required for the establishment of certain programmes or aspects of environmental management;
- To be called to site in the case of any emergency situation which may impact on the local environment;
- To liaise with various specialists and the local authorities if required, regarding issues relating to environmental management;
- To report on compliance with the OEMPr specifications to Sedibeng Water;
- To facilitate environmental audits and ensure that they are undertaken, as required;
- To keep a comprehensive record of environmental management, issues of non-compliance and minutes of meetings for audit purposes;
- To ensure monitoring programmes are implemented during the operational phase; and
- To undertake any other tasks outlined in this document, on the behalf of Sedibeng Water.

Independent Environmental Auditor (IEA)

Since provision has been made for the ESO to be an internal Sedibeng Water appointment, Sedibeng Water shall employ an independent Environmental Professional with a post graduate degree in environmental studies and a minimum of five years relevant experience to act as the independent environmental auditor for the site. The ECO is to be employed upon completion of the first year of operation, and is to perform an annual formal audit on the OEMPr, and its implementation by the relevant parties at intervals as indicated in the environmental authorisation . Specific audit requirements are contained within Section 5.3.4.

5.3.3 Financing for Environmental Management

The budget for the implementation of the OEMPr shall come out of Sedibeng Water's operational budget. Sedibeng Water must review the OEMPr and allocate the requisite funds to facilitate compliance. The majority of the items addressed in the OEMPr relate to required preventative maintenance, operator legal compliance, and responsible environmental management. Monitoring costs are also to be included.

5.3.4 OEMPr Review and Audit

OEMPr Audit

Audits of the OEMPr implementation should be undertaken on a regular basis. Internal audits (by the ESO) should be done on a quarterly basis with an external audit conducted by an independent consultant undertaken as specified below.

Each audit is to be based on site visits by the auditor as well as a review of any records of environmental management and monitoring to be kept by the ESO. The audit must also determine whether the OEMPr is adequately dealing with the range of environmental impacts on the site, i.e. whether the plan is still appropriate, or whether it needs to be extended.

The audit report is to include recommendations of changes required to the OEMPr document, management practices, etc., to improve environmental management of the site. The results of this audit are to be submitted to the NCDENC.

OEMPr Review

A schedule for the review of the OEMPr should be established by Sedibeng Water. It is recommended that the effectiveness of the OEMPr be reviewed on an annual basis, and possibly bi-annually in the first year of operation. The need for review will be identified during the annual audits.

Any proposed changes are to be submitted by the ESO to NCDENC for approval prior to implementation. Amendments or additions made to the document (with the approval of the relevant authorities) are to be included as annexures, distributed to all relevant parties, and should be considered as OEMPr specifications to which all relevant parties are bound.

Results of internal environmental audits are to inform Sedibeng Water of changes required to the OEMPr documentation.

5.3.5 Operational Phase Actions and Outcomes

In order to ensure compliance with environmental legislation, the following actions are applicable to the operational phase for the water infrastructure upgrades. The persons responsible for implementation of the actions are listed in [Table 5-3](#), the majority of which are the responsibility of Sedibeng Water. These activities are described in more detail in [Table 5-3](#).

Table 5-3: Environmental Management Outcomes and Actions Applicable to the Operational Phase

Aspect		Objective/ Outcome	Mitigation		Responsibility	Parameters for Monitoring	Timing
#	Description of Aspect		#	Management Action			
1.	Compliance with EMPr and EA	Confirm Sedibeng Water commitment to adherence to EMPr and Business Partner Compliance Standards	1.1	Ensure that the EMPr, Business Partner Compliance Standards and EA are available at the site throughout construction and implemented by the contactor.	Sedibeng Water/ ESO	Copy of signed EMPr and EA on site	Prior to operational phase
		Auditing of compliance with EMPr and EA	1.2	An audit report must be undertaken by an independent auditor at intervals as indicated in the environmental authorisation throughout the operational phase and shall be submitted to NCDENC. The audit report shall indicate the date of the audit, name of auditor, and outcome of audit in terms of compliance with the environmental authorisation and conditions of the EMPr.	Sedibeng Water/ Independent Auditor	Audit report and proof of submission to NCDENC	Throughout operational phase
2.	Occupational Health and Safety	Maintain health and safety standards for employees	2.1	Update the existing Occupational Health and Safety Plan for the WTP to ensure it covers the upgraded facilities and increased chemical storage areas to include specific procedures on chemical hazards, fire and explosions, heavy lifting, work at heights, confined spaces and on site-traffic hazards in accordance with the Occupational Health and Safety Act, 1983 (Act No. 85 of 1993) (OHS Act, 1993 (OHSAct), requirements.	Sedibeng Water	Updated Health & Safety Plan	Throughout operational phase
			2.2	Firefighting equipment (e.g. fire hydrants, fire hose reels and an automatic sprinkler system) shall be installed in buildings and maintained to meet the minimum requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) (OHS Act, 1993).	Sedibeng Water	Visual Inspection	Throughout operational phase
			2.3	Gas detectors shall be fitted in the chlorine gas storage facility as preventative measures against gas leaks.	Sedibeng Water	Visual Inspection	Throughout operational phase
			2.4	Appropriate Personal Protection Equipment (PPE) must be worn by all personnel (e.g. footwear, earplugs, masks, protective clothing and goggles) where necessary.	Sedibeng Water	Visual Inspection	Throughout operational phase
			2.5	Implement Health and Safety communication and training programmes to prepare workers to recognise and respond to workplace hazards. Programmes will include aspects of hazard identification, safe operating and materials handling procedures, safe work practices, basic emergency procedures and special hazards unique to their jobs.	Sedibeng Water	Proof of training	Throughout operational phase
			2.6	Undertake a job safety analysis to identify specific potential occupational hazards and industrial hygiene surveys, as appropriate, to monitor and verify chemical exposure levels, and compare with applicable occupational exposure standards.	Sedibeng Water	Records of safety analysis	Throughout operational phase

Aspect		Objective/ Outcome	Mitigation		Responsibility	Parameters for Monitoring	Timing
			2.7	Safety signage shall be placed in prominent areas at the entrance to designated high-risk zones (i.e. pump houses). All employees and Business Partners working conditions shall comply with the requirements of the OHS Act (Act No 85 of 1993). Where necessary, workers will be required to wear ear and other appropriate PPE.	Sedibeng Water	Visual inspection Incident Reports	Throughout operational phase
			2.8	Regular medical surveillance (which includes employee hearing tests and monitoring) shall be conducted for all employees working in designated noise zones for prolonged periods of time.	Sedibeng Water	Medical Reports	Throughout operational phase
			2.9	Develop an Emergency Preparedness and Response Plan (EPRP) that is commensurate with the risks of the facility.	Sedibeng Water	EPRP on site	Throughout operational phase
3.	Dust and other air emissions	Limit fugitive dust and exhaust emissions	3.1	Maintenance vehicles travelling on gravel roads shall stick to specified speed limits.	Sedibeng Water	Visual inspections Incident Reports Grievance procedure	Throughout operational phase
			3.2	Vehicles shall be serviced regularly and kept in good working order to minimise emissions.	Sedibeng Water	Proof of servicing Grievance procedure	Throughout operational phase
			3.3	A Grievance Procedure shall be established whereby complaints are recorded and responded to.	Sedibeng Water	Grievance procedure	Throughout operational phase
4.	Material storage and handing	Minimise potential spills and/ or leaks	4.1	All chemicals and toxins shall be stored in a bunded area with sufficient capacity to retain 110% of the volume of the spill.	Sedibeng Water	Environmental Monitoring Report Record of spills and proof of safe disposal	Throughout operational phase
			4.2	Material Safety Data Sheets for all applicable materials stored on site must be readily available to on site personnel.	Sedibeng Water	MSDS on site	Throughout operational phase
			4.3	Sludge that is removed from the WTP shall be done by a licensed Business Partner and disposed of at a registered landfill site (or as appropriate).	Sedibeng Water	Record of safe disposal	Throughout operational phase
			4.4	All wastes that cannot be reused or recycled shall be collected by approved waste Business Partners and disposed of in a registered landfill or licensed hazardous waste site.	Sedibeng Water	Proof/ record of disposal	Throughout operational phase
5.	Waste and effluent	Suitable management and disposal of waste produced	5.1	Meet all Water Use Licence (WUL) and/or General Authorisation (GA) requirements as specified by the Department of Water and Sanitation.	Sedibeng Water	Proof or WUL and/or GA and required monitoring records	Throughout operational phase
6.	Noise	Minimise noise due to operational activities	6.1	All employees and Business Partners working conditions shall comply with the requirements of the Occupational Health and Safety Act, 1983 (Act No. 85 of 1993) (OHS Act, 1993). Where necessary, workers will be required to wear ear protection equipment. Noisy plant and equipment shall be insulated to reduce noise to within acceptable standards as specified by SANS 10103 (2008).	Sedibeng Water	Visual inspection Proof of insulation	Throughout operational phase

Aspect		Objective/ Outcome	Mitigation		Responsibility	Parameters for Monitoring	Timing
			6.2	Noisy maintenance works shall only be carried out during the daytime hours, 07h00 to 18h00.	Sedibeng Water	Visual inspection Incident Reports	Throughout operational phase
			6.3	A Grievance Procedure shall be established whereby noise complaints are recorded and responded to.	Sedibeng Water/	Grievance procedure	Throughout operational phase
7.	Local Economy/ Employment	Maximise local employment opportunities	7.1	Sedibeng Water shall establish a recruitment and procurement policy which sets reasonable targets for the employment of local residents and South African, suppliers (originating from the local municipality) and promote the employment of women as a means of ensuring that gender equality is attained. Criteria will be set for prioritising, where possible, local (local municipality) residents/suppliers over regional or national residents/suppliers.	Sedibeng Water	Recruitment Policy BBEEE records of all people suppliers and services used	Throughout operations
			7.2	Sedibeng Water shall, where practically possible, procure services, material and equipment from BBEE suppliers with a rating of level 4 or better, with a preference for regional suppliers.	Sedibeng Water	BBEE records of all people suppliers and services used	Throughout operational phase
			7.3	Formal channels for employment shall be set up and no employment shall take place at the entrance to the site.	Sedibeng Water	Recruitment Policy	Throughout operational phase
			7.4	Provide all appointed Business Partners and suppliers with Health, Safety, Environment and Quality training as required.	Sedibeng Water	Records of all people employed and training provided	Throughout operational phase
8.	Management of Grievance Procedure	Ensure that the grievance procedure is being utilized efficiently	8.1	A grievance procedure must be developed and implemented whereby issues can be raised, recorded and transparently and timeously addressed. This shall be periodically reviewed to ensure that it remains adequate.	Sedibeng Water	Records of responses to grievances and close out.	Throughout operational phase
9.	Impact on Flora	Minimise impacts on flora	9.1	Maintenance activities must remain within the servitude and minimise the footprint to be impacted on. Sensitive areas must be avoided as far as possible.. Ongoing monitoring and removal programmes should be undertaken for alien invasive species, particularly, but not limited, to the areas where the pipeline was constructed and any areas where maintenance requires excavating sections of the pipeline.	Sedibeng Water	Record of Maintenance undertaken and site photographs	Throughout operational phase
			9.2	Regular monitoring for erosion to ensure that no erosion issues are occurring at the site as a result of the roads and other infrastructure. All erosion issues observed should be rectified as soon as possible, using the appropriate flow management and erosion control structures. Ongoing monitoring and removal programmes should be undertaken for alien invasive species, particularly, but not limited to the areas where the pipeline was constructed and any areas where maintenance requires excavating sections of the pipeline.	Sedibeng Water	Environmental Monitoring Report	Throughout operational phase
			9.4	Vehicles used for maintenance activities should use designated, existing roads. Monitoring and recording of any animal mortalities must be conducted and reported on a monthly basis.	Sedibeng Water	Environmental Monitoring Report	Throughout operational phase

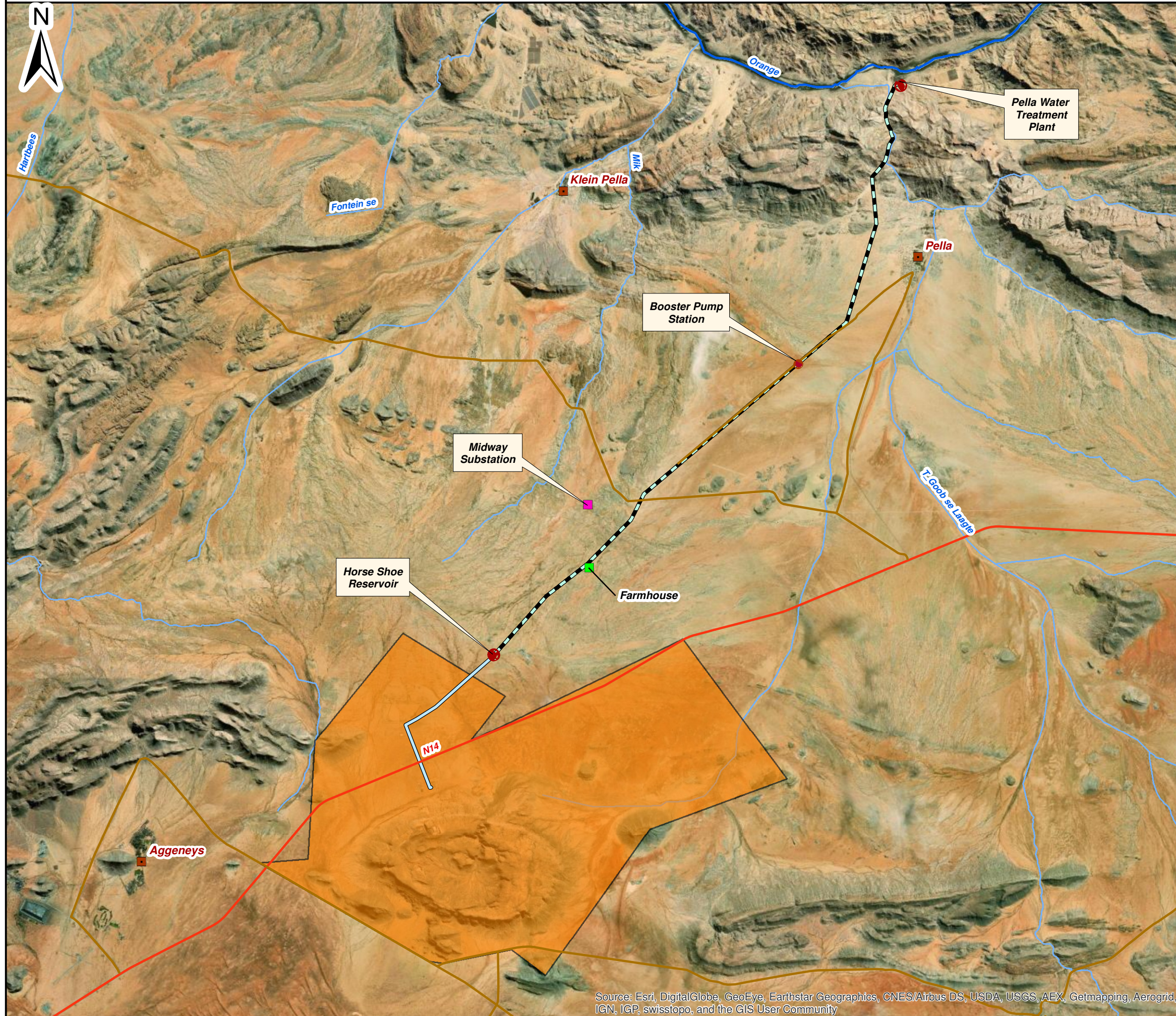
Aspect		Objective/ Outcome	Mitigation		Responsibility	Parameters for Monitoring	Timing
10.	Impact on Fauna/ Flora	Minimise impacts on fauna/ flora	10.1	Any fauna encountered during maintenance activities shall be allowed to move off on their own. Tortoises and other slow-moving animals can be carefully moved to a sheltered site out of the way.	Sedibeng Water	Environmental Monitoring Report	Throughout operational phase
			10.2	All maintenance vehicles shall adhere to a low speed limit to avoid collisions with susceptible species such as snakes and tortoises.	Sedibeng Water	Environmental Monitoring Report	Throughout operational phase
			10.3	The collection, hunting or harvesting of any plants or animals at the site shall be strictly forbidden and signs stating this shall be placed at various points along the pipeline route.	Sedibeng Water	Environmental Monitoring Report	Throughout operational phase
			10.4	No fires shall be allowed along the pipeline route or inside the WTP.	Sedibeng Water	Environmental Monitoring Report	Throughout operational phase
			10.5	No vegetation of any kind may be collected from areas surrounding the site by any person employed for the Project.	Sedibeng Water	Environmental Monitoring Report	Throughout operational phase

Kate Hamilton
(Report Author)

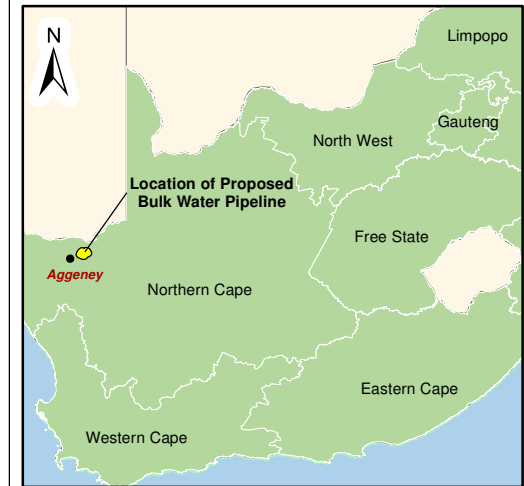
Kate Hamilton
(Project Manager)

Stuart Heather-Clark
(Reviewer)

APPENDIX A: MAPS

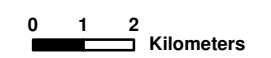


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Legend

- Proposed Underground Bulk Water Pipeline
- Existing Bulk Water Pipeline
- Towns / Villages
- Main Roads
- Secondary Roads
- Rivers and Streams
- Gamsberg Mining Right Area



Scale: 1:150 000 @ A3
 Projection: Transverse Mercator
 Datum: WGS1984, Lo19

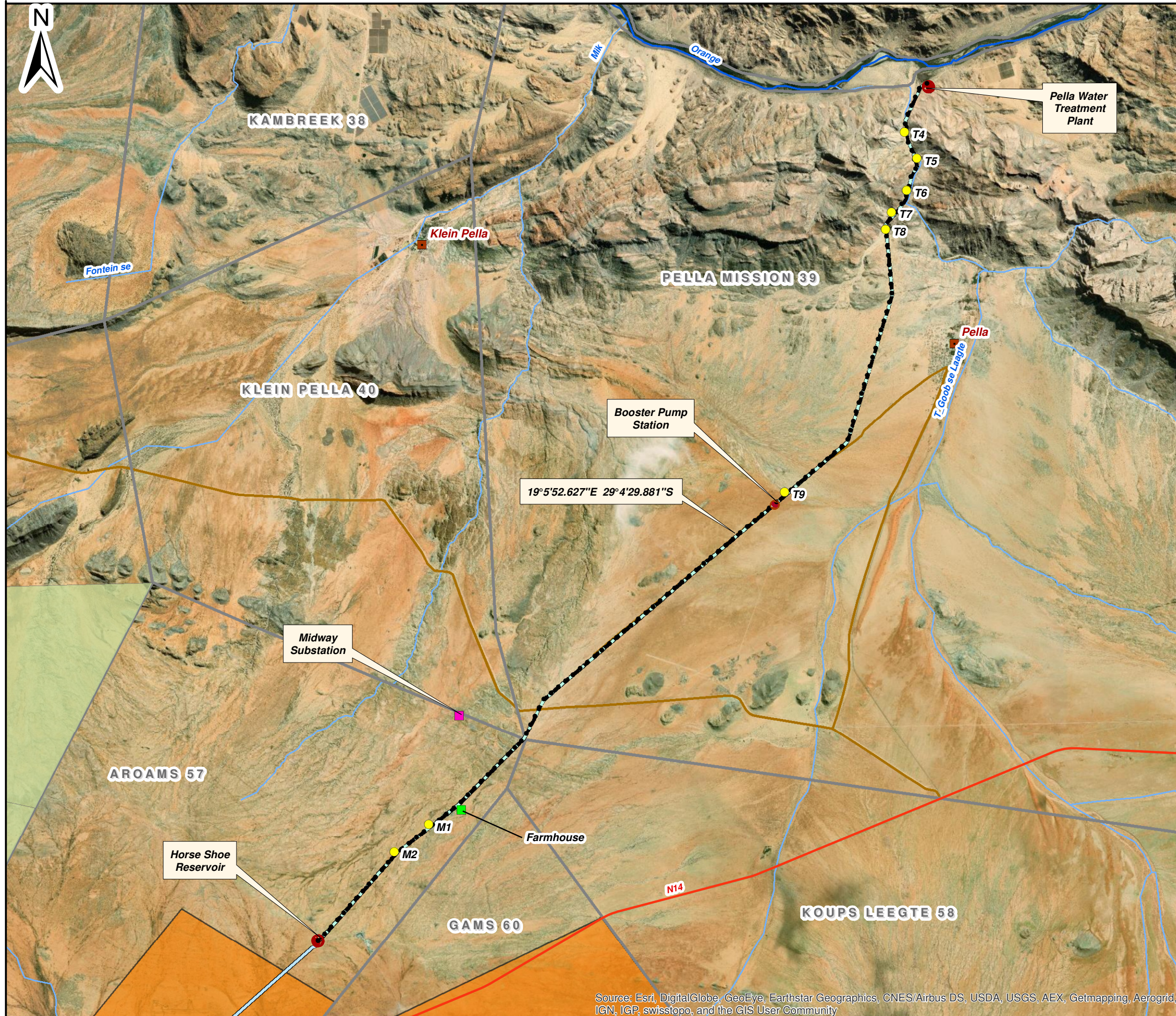
Gamsberg Smelter Project

Figure 1

Local Setting



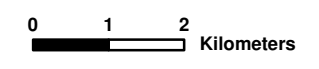
SLR Consulting (Africa) (Pty) Ltd
 P O Box 1596, Cramerview, 2060, South Africa
 Tel: +27 (11) 467-0945 Fax: +27 (11) 467-0978



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Proposed Underground Bulk Water Pipeline (within the existing servitude)
- Existing Bulk Water Pipeline
- Towns / Villages
- Main Roads
- Secondary Roads
- Rivers and Streams
- Farm Boundaries
- Gamsberg Mining Right Area
- Gamsberg Nature Reserve
- River Crossings



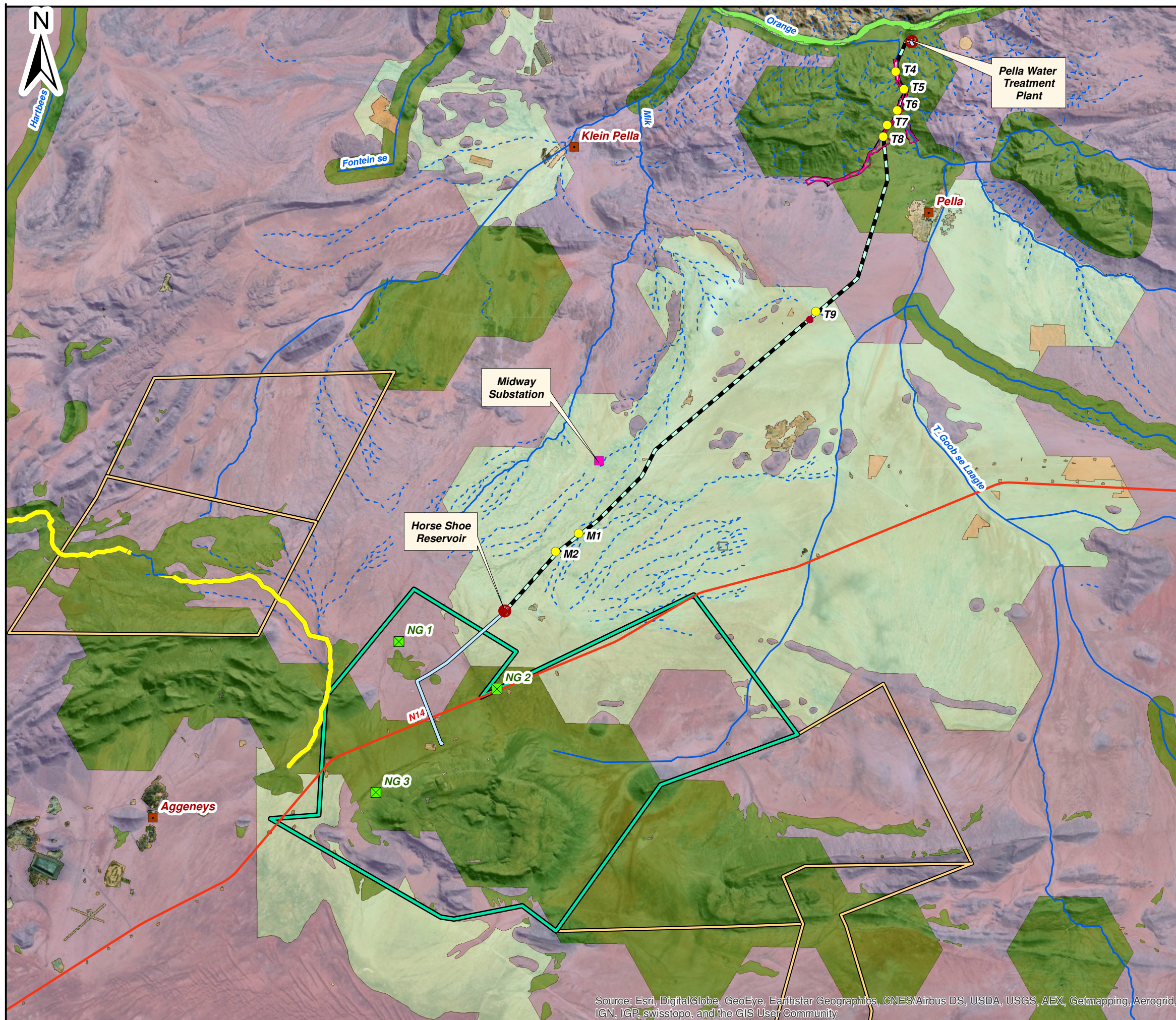
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Gamsberg Smelter Project

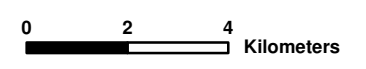
Figure 5
Proposed Pella Bulk Water Pipeline



SLR Consulting (Africa) (Pty) Ltd
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- Legend**
- Proposed Underground Bulk Water Pipeline
 - Existing Bulk Water Pipeline
 - Towns / Villages
 - Main Roads
 - Rivers
 - Tributaries
 - Gamsberg Mining Right Area
 - Gamsberg Nature Reserve
 - Archaeological and Paleo Findings
 - River Crossings
 - 1 : 100 Year Floodline
 - 1 : 50 Year Floodline
 - NFEPA_Wetlands**
 - Floodplain wetland
 - Seep
 - CBA Categories**
 - Critical Biodiversity Area One
 - Critical Biodiversity Area
 - Ecological Support Area
 - Other Natural Areas



Scale: 1:150 000 @ A3
 Projection: Transverse Mercator
 Datum: WGS1984, Lo19

Gamsberg Smelter Project

Figure 6
Sensitivity



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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

APPENDIX B: EAP CURRICULUM VITAE

CURRICULUM VITAE



KATE HAMILTON

Senior Environmental Consultant

Environmental Management, Planning and Approvals,
Africa

QUALIFICATIONS

BSc	1997	Majors in Environmental & Geographical Science, Zoology and Botany, UCT, RSA
BSc (Hons)	1999	Majors in Environmental & Geographical Science and Zoology, UCT, RSA

EXPERTISE

- Environmental Impact Assessments
- Environmental Management Programmes
- Water Use Licence Applications
- Project Management

Kate is a Senior Consultant based in Johannesburg. As a specialist environmental project manager she has over 12 years of private sector experience in Environmental Consulting. Kate has worked as a project manager in the environmental field where she has developed core competencies in environmental management, project management and coordination and environmental monitoring, with a focus in the mining sector. Kate has worked on projects throughout the project lifecycle from exploration/ site identification through pre-feasibility to feasibility, to operation and closure for the mining, power, infrastructure and oil and gas sectors. This includes conducting site identification, screening and scoping studies, baseline studies, impact assessments, monitoring, management planning and implementation, and public consultation processes; for local regulatory permitting processes, as well as project finance and development finance institution's requirements in line with international best practice standards. Kate has worked extensively in the SADC region as well as in West Africa and has experience in managing large scale environmental projects with large integrated teams in challenging locations across the continent.

Kate started work with SLR in May 2019.

PROJECTS

Projects that Kate has worked on at SLR and prior to SLR

Pella Bulk Water Pipeline Upgrade, Northern Cape, Current

Project Manager for the Pella Bulk Water Pipeline Upgrade Basic Assessment process which includes a thorough stakeholder engagement process.

Gamsberg Zinc Smelter EIA, Northern Cape, Current

Project Manager for the Gamsberg Smelter Project at the Gamsberg Zinc Mine in the Northern Cape Province of South Africa. Project included the Scoping and EIA process, Waste Management Licence (WML), Water Use Licence Application (WULA) and Atmospheric Emissions Licence (AEL).

Confidential Power Project, Nigeria, 2017 –2019	Update of ESIA's for the Power Plant and the Transmission Line including relevant specialist studies, as well as compilation of a consolidated Environmental and Social Management and Monitoring Plan (ESMMP) for submission to the Nigerian Authorities. This included a Baseline Revalidation Report for both ESIA's.
Kangra Coal (Pty) Ltd, South Africa, 2016 –2018	Kate was the Project Manager for the Environmental Impact Assessment (EIA) and Environmental Management Programme (EMPr) for the construction, operation and decommissioning of a new discard dump, a new adit and overland conveyor, and new underground works at Kangra Coal's Savmore Colliery, Mpumalanga, South Africa. Mitigation and management measures were identified through various specialist studies to reduce/minimise impacts on the environment due to project related activities and were included in the EMPr. A thorough stakeholder engagement process was also undertaken whereby all interested and/or affected parties were informed of the process and given the opportunity to comment. This EIA and EMPr was compiled in accordance with the South African EIA Regulations (December, 2014).
James Durrans& Sons Ltd, South Africa, 2016 –2017	Project manager for the EIA and EMPr for a new Calcination Plant in the Sasolburg area.
ESIA for 350 MW solar PV project in Zambia, 2016 – 2018.	Scoping and EIA process for a greenfield Solar PV Plant in the vicinity of Lusaka for submission to ZEMA.
Kangra Coal (Pty) Ltd, South Africa, 2015 –2017	In terms of Section 22 (4a) of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA), Kangra Coal was required to apply for a Mining Right from the Regional DMR. This involved the compilation, submission and approval of an EIA and EMPr in terms of Section 39 of the MPRDA. As part of the regulatory process a Scoping and EIA Phase was undertaken including the required stakeholder engagement.
Encorex Tsepa Joint Venture, South Africa, 2015	Project Manager for the Installation of aboveground storage tanks (AST's) for the storage of LPG at the Masakhane Laundry Facility, Rosslyn.
Shell Rocky Drift, South Africa, 2015	Effluent disposal permit application.
Distell Group Limited, South Africa, 2015	Project Manager for the Basic Assessment Report for the installation of Carbon Dioxide and Ethanol storage tanks.
Vodacom Midrand Ltd, South Africa, 2014	Project Manager for numerous applications for the installation of diesel tanks at various locations on their Midrand Campus site. EMP training was also undertaken for Vodacom staff.
Prominent Paints, South Africa, 2014	Project Manager for the Section 24 G application for the installation of tanks at their site.
Engen Petroleum Ltd, South Africa, 2013-2014	Basic Assessment Application for a new service station and associated bridge widening.

Venetia Diamond Mine, South Africa, 2013-2014	Kate was the Project Manager for the EIA process to license the waste activities at Venetia Diamond Mine. The waste management facilities for the open pit and underground operations required licensing under the National Environmental Management: Waste Act (Act 59 of 2008).
Western Cluster Limited, Liberia, 2012 -2013	Kate was the Project Manager for the Environmental and Social Impact Assessment (ESIA) for the redevelopment of the Bomi Iron Ore Mine. The project involved the redevelopment of an 80 mtpa iron ore mine near Tubmanburg in Liberia. The ESIA was undertaken in line with IFC Performance Standards under severe time constraints. Timely submission of the ESIA enabled the client to achieve environmental authorisation of the Mine prior to the Project being put on hold due to the Ebola outbreak in early 2014.
Letseng Diamond Mine, Lesotho, 2012	The Social and Environmental Management Plan (SEMP) Report included the management of a new diamond processing plant (Plant No. 3), a new Tailings Storage Facility (TSF), expansions to the Waste Rock Dump (WRD) and relocation of the mining complex to allow for the expansion of the mining pits. The process included the consolidation of the existing EMPs to include all current and future operations, and to align the LDM SEMP to relevant good international industry practice.
Venetia Diamond Mine, South Africa, 2011	An EIA process was undertaken for the Venetia Mine for the expansion of the current open pit operations to include underground operations. In order for DBCM to meet all regulatory requirements a parallel EIA approval process was followed in order to meet all the requirements of the Mineral and Petroleum Resources Development Act (MPRDA), 2002; the National Environmental Management Act (NEMA), 1998; the National Environmental Management: Waste Act (NEMWA), 2008; and the National Water Act (NWA), 1998.
Anglo Platinums' Lebowa Platinum Mine, South Africa, 2008-2010	EIA and EMP for amendment to an Environmental Management Plan for the installation of above ground storage tanks at Anglo Platinums' Lebowa Platinum Mine.
Mmamabula Energy Project, Botswana, 2006 - 2009	The Mmamabula Energy Project involved the development of a coal mine, power station and associated infrastructure in southern Botswana. Kate also assisted with the stakeholder consultations for the project.
Anglo Platinums' Twickenham Platinum Mine, South Africa, 2008	Social and Environmental Scan at Anglo Platinums' Twickenham Platinum Mine, to identify environmental and social sensitivities at the potential temporary tailings dam sites.
Goldfields Kloof, South Deep and Driefontein Gold Mines, South Africa, 2008-2009	Compilation of an EIA and EMP report for the amendment of the EMP for the installation of emergency power generators and associated diesel storage at Goldfields Kloof, South Deep and Driefontein Gold Mines, South Africa, 2008-2009.
Shell NEMA Rectification Applications for above and underground fuel storage tanks, 2007	Kate was involved in the undertaking of site visits, report writing and the submission of Rectifications reports for the Western Cape Province. The role entailed the coordination of site visits and reporting requirements, project database management, quality control of report deliverables, authority liaison and submission of the required deliverables.

<p>Environmental review of the Durban International Airport site for redevelopment into a container port, South Africa, 2007</p>	<p>Compilation of a report to identify potential environmental and social restrictions associated with future development of the site. Issues considered included historical soil and groundwater contamination, biodiversity and social issues such as resettlement of existing land users. Cost estimates to address both environmental site liabilities as well as cost to meet legislative requirements in terms of the EIA regulations were provided.</p>
<p>MEMBERSHIPS</p>	
<p>Member</p>	<p>International Association for Impact Assessment (South Africa)</p>
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