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# FINAL BASIC ASSESSMENT

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## The Proposed Construction of a Pipeline Senekal Bulk Water Supply Setsoto Local Municipality

**Applicant:** Setsoto Local Municipality  
**MDA Ref No:** 40714  
**Date:** August 2019



Town & Regional Planners,  
Environmental & Development  
Consultants

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**destea**

 department of  
 economic, small business development,  
 tourism and environmental affairs  
 FREE STATE PROVINCE

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File Reference Number:

Application Number:

Date Received:


Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

**Kindly note that:**

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2014 as amended and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. This report format is current as of **07 April 2017**. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
3. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
4. Where applicable **tick** the boxes that are applicable in the report.
5. An incomplete report may be returned to the applicant for revision.
6. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
7. This report must be handed in at offices of the relevant competent authority as determined by each authority.
8. No faxed or e-mailed reports will be accepted.
9. The signature of the EAP on the report must be an original signature.
10. The report must be compiled by an independent environmental assessment practitioner.
11. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
12. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
13. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.

14. Two (2) colour hard copies and one (1) electronic copy of the report must be submitted to the competent authority.
15. Shape files (.shp) for maps must be included in the electronic copy of the report submitted to the competent authority.

**SECTION A: ACTIVITY INFORMATION**

Has a specialist been consulted to assist with the completion of this section?

YES	
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If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I.

**1. PROJECT DESCRIPTION****a) Describe the project associated with the listed activities applied for**

The proposed project entails the construction of a 500mm diameter pipeline in order to convey water to the new water treatment works at Senekal. The pipeline will be constructed within 32m of a watercourse at certain section(s). The construction of an 11 000kℓ reservoir will also be undertaken as part of the project. Note that, due to the volume of the proposed reservoir, activities associated with the construction of the reservoir is not listed as per GN 324, 325 or 327.

The project will form part of the bulk water supply of Senekal, Setsoto Local Municipality.

**b) Provide a detailed description of the listed activities associated with the project as applied for**

Listed activity as described in GN 327, 325 and 324	Description of project activity
<b>GN 327</b>	
<p><b>Listed Activity 9:</b> The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water</p> <p>(i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more;</p> <p>excluding where (a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve; or (b) where such development will occur within an urban area.</p>	<p>The proposed pipeline has an internal diameter of 0.5 metres. Sections of the pipeline will be constructed outside of the urban area.</p>
<b>Listed Activity 12:</b>	Infrastructures / structures with a

Listed activity as described in GN 327, 325 and 324	Description of project activity
<b>GN 327</b>	
The development of – (ii) Infrastructure or structures with a physical footprint of 100 square meters or more  Where such development occurs – (c) if no development setback exists, within 32 meters of a watercourse, measured from the edge of a watercourse.	physical footprint of more than 100 square meters within 32m of a watercourse will be constructed, as part of the proposed project.
<b>Listed Activity 19:</b> The infilling or depositing of any material of more than 10 cubic metre into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse	Material may be removed / deposited within 32 m of a watercourse, due to the proposed construction of the said pipeline.

## 2. FEASIBLE AND REASONABLE ALTERNATIVES

“**alternatives**”, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

Describe alternatives that are considered in this application as required by Appendix 1 (3)(h) of GN 326, Regulation 2014 as amended. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

The determination of whether site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the, competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

The identification of alternatives should be in line with the Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004. Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

The proposed project entails the construction of new raw water pipelines (DN 500mm PVC-u) to convey water to the new water treatment works. Construction of a new water treatment works at the existing reservoir site will also be undertaken. The construction of an additional reservoir with a capacity of at least 11 000Kℓ is proposed.

It is proposed that the WTW will be supplied directly from the two off channel storage dams situated at each of the sources, being the Cyferfontein off-channel storage dam and the De Put off-channel storage dam. Water shall be abstracted from these dams and will be transported via two new water mains directly to the new WTW in town. The above mentioned dams will be supplied with water from the Sand River and the Sand Spruit respectively, with raw water abstracted from the two sources via newly constructed abstraction points or abstraction pump stations.

Alternative Routes investigated:

**a) Alternative 1 Preferred route alternative:**

Re-align the new raw water rising main pipeline to the gravel road running from Senekal to the Cyferfontein off-channel storage dam. The gravel road referred to is the extension of Ad Keet and Main Road, servicing the small holdings and farms in the area. The booster pump station will be situated at the Cyferfontein off-channel storage dam.

It is proposed to construct the pipeline on the Eastern Side of the road. The reason would be that on the Western Side, many house crossings would be required and this could be problematic. It is suggested that the pipeline be constructed in a 10m servitude next to the road reserve. Another benefit from this option is that the valve chambers and potential leaks can be detected more easily.

The proposed pipeline will cross a stream. Shallow bed rock material will allow for suitable foundation conditions for the construction of the required stream crossing.

**b) Alternative 2 Route:**

Follow the existing pipeline route with a booster pump station situated at

Cyferfontein off-channel storage dam. Note that the pipeline route will follow an existing registered servitude. The servitude hosts a buried water pipeline and overhead electricity lines. However, the width of the existing servitude is insufficient to accommodate the proposed pipeline and therefore the servitude will have to be extended.

This option is **not viable** as the pipeline will be running straight through the farmers lands and no visual leaks can be seen from the road.

**c) Alternative 3<sub>Route</sub>:**

Construction of a gravitational pipeline to gravitate water to as close to town as possible. The booster pump station will be situated closer to town.

NOTE: This route **was ruled out** due to the capital construction cost escalating above the other routes. In addition, it was regarded as potential for theft at the Power Station and no visual siting for leaks will be visible from the road.

The proposed pipeline will cross a stream. Shallow bed rock material will allow for suitable foundation conditions for the construction of the required stream crossing.

**Two Design Alternatives were investigated for the stream crossing section:**

- Sub-surface stream crossing using directional drilling or trench excavation if the conditions allow for this option. The pipeline will then be protected using gabion mattresses and other erosion protection methods.
- Above surface / overhead stream crossing by means of a bridge-type structure.

Please refer to Appendix A for more information.

**a) Site alternatives**

Alternative 1 <sub>Preferred</sub>	
Description	
	Re-align the new raw water rising main pipeline to the gravel road running from Senekal to the Cyferfontein off-channel storage dam. The gravel road referred to is the extension of Ad Keet and Main Road, servicing the small holdings and farms in the area. The booster pump station will be situated at the Cyferfontein off-channel storage dam.
Alternative 2 <sub>Route</sub>	
Description	
	Follow the existing pipeline route with a booster pump station situated at Cyferfontein off-channel storage dam. Note that the pipeline route will

follow an existing registered servitude. The servitude hosts a buried water pipeline and overhead electricity lines. However, the width of the existing servitude is insufficient to accommodate the proposed pipeline and therefore the servitude will have to be extended.

#### Alternative 3<sub>Route</sub>

##### Description

Construction of a gravitational pipeline to gravitate water to as close to town as possible. The booster pump station will be situated closer to town.

#### Alternative 4<sub>Locality</sub>

##### Description

No locality alternatives were investigated as the proposed pipeline took the flow of the watercourse and existing WTW and raw water pipeline infrastructure into consideration.

In the case of linear activities:

#### Alternative 1<sub>Preferred</sub>

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

#### Latitude (S):

#### Longitude (E):

28°14'20.08"S	27°39'33.76"E
28°16'19.55"S	27°38'25.88"E
28°19'13.77"S	27°37'40.67"E

#### Alternative 2<sub>Route</sub>

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

28°14'21.36"S	27°39'33.96"E
28°18'18.01"S	27°37'51.04"E
28°21'9.88"S	27°37'17.19"E

#### Alternative 3<sub>Route</sub>

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

28°14'20.14"S	27°39'33.61"E
28°16'42.18"S	27°37'48.37"E
28°18'10.03"S	27°36'50.14"E

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

This section is similar for Alternative 1 <sub>Preferred</sub> , Alternative 2 <sub>Route</sub> and Alternative 3 <sub>Route</sub>	28°19'22.24"S	27°37'36.63"E
	28°19'38.08"S	27°37'31.78"E
	28°19'53.94"S	27°37'27.24"E
	28°20'8.84"S	27°37'19.22"E
	28°20'23.37"S	27°37'18.76"E
	28°20'40.03"S	27°37'19.39"E
	28°20'55.59"S	27°37'12.16"E
	28°21'10.07"S	27°37'17.01"E



Alternative 1 <sub>Preferred</sub>		Alternative 2 <sub>Route</sub>		Alternative 3 <sub>Route</sub>	
28°14'20.14"S	27°39'33.61"E	28°14'21.36"S	27°39'33.96"E	28°14'20.14"S	27°39'33.61"E
28°14'25.60"S	27°39'28.67"E	28°14'33.25"S	27°39'23.12"E	28°14'25.60"S	27°39'28.67"E
28°14'33.10"S	27°39'23.35"E	28°14'44.75"S	27°39'11.63"E	28°14'33.10"S	27°39'23.35"E
28°14'40.48"S	27°39'18.32"E	28°15'1.02"S	27°39'7.23"E	28°14'40.48"S	27°39'18.32"E
28°14'44.07"S	27°39'11.77"E	28°15'17.43"S	27°39'2.58"E	28°14'44.07"S	27°39'11.77"E
28°14'52.23"S	27°39'9.46"E	28°15'33.06"S	27°38'58.75"E	28°14'52.23"S	27°39'9.46"E
28°15'1.08"S	27°39'7.07"E	28°15'47.96"S	27°38'52.26"E	28°15'1.08"S	27°39'7.07"E
28°15'9.95"S	27°39'4.59"E	28°16'0.06"S	27°38'38.50"E	28°15'9.95"S	27°39'4.59"E
28°15'18.71"S	27°39'2.22"E	28°16'14.57"S	27°38'30.11"E	28°15'18.71"S	27°39'2.22"E
28°15'27.29"S	27°38'59.87"E	28°16'30.73"S	27°38'26.42"E	28°16'15.25"S	27°38'24.35"E
28°15'36.61"S	27°38'57.32"E	28°16'47.52"S	27°38'21.49"E	28°16'20.68"S	27°38'18.57"E
28°15'45.89"S	27°38'53.81"E	28°17'5.41"S	27°38'15.14"E	28°16'26.02"S	27°38'12.91"E
28°15'52.66"S	27°38'49.52"E	28°17'22.74"S	27°38'8.99"E	28°16'31.47"S	27°38'6.98"E
28°15'55.59"S	27°38'42.89"E	28°17'39.08"S	27°38'3.16"E	28°16'36.97"S	27°38'1.23"E
28°16'1.82"S	27°38'36.83"E	28°17'55.80"S	27°37'57.92"E	28°16'39.99"S	27°37'55.38"E
28°16'8.79"S	27°38'31.18"E	28°18'11.77"S	27°37'51.93"E	28°16'42.18"S	27°37'48.37"E
28°16'17.83"S	27°38'29.62"E	28°18'27.14"S	27°37'51.47"E	28°16'44.35"S	27°37'41.44"E
28°16'35.54"S	27°38'25.07"E	28°18'43.63"S	27°37'49.94"E	28°16'49.93"S	27°37'37.49"E
28°16'44.60"S	27°38'21.98"E	28°18'59.97"S	27°37'45.52"E	28°16'57.34"S	27°37'35.01"E
28°16'53.42"S	27°38'18.92"E	28°19'14.71"S	27°37'40.43"E	28°17'4.83"S	27°37'32.45"E
28°17'2.07"S	27°38'15.98"E			28°17'12.36"S	27°37'29.96"E
28°17'10.87"S	27°38'12.92"E			28°17'19.88"S	27°37'27.41"E
28°17'19.53"S	27°38'9.94"E			28°17'25.72"S	27°37'22.47"E
28°17'28.70"S	27°38'6.73"E			28°17'30.36"S	27°37'16.19"E
28°17'37.53"S	27°38'3.72"E			28°17'35.25"S	27°37'9.65"E
28°17'46.30"S	27°38'0.69"E			28°17'40.16"S	27°37'3.56"E
28°17'54.73"S	27°37'57.75"E			28°17'46.35"S	27°36'58.80"E
28°18'3.32"S	27°37'54.75"E			28°17'53.88"S	27°36'57.54"E
28°18'12.26"S	27°37'51.68"E			28°18'0.22"S	27°36'57.06"E
28°18'20.62"S	27°37'48.77"E			28°18'1.89"S	27°36'48.63"E
28°18'25.19"S	27°37'52.31"E			28°18'10.03"S	27°36'50.14"E
28°18'34.27"S	27°37'50.76"E				
28°18'43.14"S	27°37'50.35"E				
28°18'48.84"S	27°37'50.16"E				
28°18'48.52"S	27°37'56.69"E				
28°18'57.65"S	27°37'57.17"E				
28°18'58.31"S	27°37'50.49"E				
28°18'58.96"S	27°37'44.73"E				
28°19'7.30"S	27°37'42.44"E				
28°19'14.75"S	27°37'40.39"E				

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A of this form.

**NOTE:**

Alternative 2<sub>Route</sub> and Alternative 3<sub>Route</sub> will not be discussed further in this report, as these options are not seen as feasible / reasonable alternatives due to the following:

**Alternative 2<sub>Route</sub>:** This option is not viable as the pipeline will be running straight through the farmers lands and no visual leaks can be seen from the road.

**Alternative 3<sub>Route</sub>:** This route was ruled out due to the capital construction cost escalating above the other routes. In addition, it was regarded as potential for theft at the Pump Station and no visual siting for leaks will be seen from the road.

**b) Lay-out alternatives****Alternative 1<sub>Preferred</sub>****Description**

Please refer to the previous paragraph for more information on the preferred alternative.

**Alternative 4<sub>Design and Layout</sub>****Description**

The proposed layout took the following into consideration:

- Watercourses
- Gradient of site
- Existing servitudes
- Land-uses in the surrounding area

The most suitable layout and design is therefore proposed as part of the Preferred Option.

**Two Design Alternatives were investigated for the stream crossing section:**

- Sub-surface stream crossing using directional drilling or trench excavation. The pipeline will then be protected using gabion mattresses and other erosion protection methods.

However, this option was not seen as a feasible and / or reasonable alternative and will not be discussed in this document.

- The preferred option is to construction the pipeline **above the surface / overhead stream crossing** by means of a bridge-type structure. The pipe

will exit the stream on one side with the minimum cover of 1000mm below natural ground level, cross stream and enter other side of stream with minimum cover of 1000mm below natural ground level. The pipe will be a 500mm steel pipe and supported at every 6m intervals. This option also ensure the visibility of the pipe. Leaks will be detected easily and it will also limit the occurrence of erosion.

**c) Technology alternatives**

<b>Alternative 1 Preferred</b>
<p><b>Description</b></p> <p>Please refer to the previous paragraph for more information on the preferred alternative.</p>
<b>Alternative 5 Type and Technology</b>
<p><b>Description</b></p> <p>No type and technology alternatives were investigated in detail.</p>

**e) No-go alternative**

The no-go alternative is not seen as a reasonable / feasible alternative as this will place the Setsoto Local Municipality in such a position that it will not be able to provide Senekal with sufficient volume of portable water, resulting in a water shortage that may lead to water restrictions on a regular basis.

The proposed pipeline and associated infrastructure is considered essential to enable the said municipality to provide the Senekal area with adequate basic services, as the proposed project entails the transportation of raw water in order to provide Senekal with sufficient volume of potable water.

As the project is described as a basic service, the lack thereof will lead to major social and economic impacts that will indirectly cause severe environmental concerns. The impacts expected during the construction phase of the proposed project can be minimised through the recommended mitigation measures and therefore the no-go alternative is not ideal.

**Paragraphs 3 – 13 below should be completed for each alternative.**

### 3. PHYSICAL SIZE OF THE ACTIVITY

a) Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

for linear activities:

**Alternative:**

Alternative A1<sub>Preferred</sub>

**Length of the activity:**

13 600 m

b) Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

**Alternative:**

Alternative A1<sub>Preferred</sub>

**Size of the site/servitude:**

136 000 m<sup>2</sup>, if a servitude of 10 m is taken into account

### 4. SITE ACCESS

Does ready access to the site exist?

YES

If NO, what is the distance over which a new access road will be built

m

Describe the type of access road planned:

The existing dirt roads will be used to gain access to the site, as far as possible. Should additional roads be constructed, care will be taken as to limit the occurrence of stormwater run-off and erosion. The removal of vegetation will also be limited.

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

### 5. LOCALITY MAP

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.). The map must indicate the following:

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;
- indication of all the alternatives identified;
- closest town(s);
- road access from all major roads in the area;

- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

## 6. LAYOUT/ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

## 7. SENSITIVITY MAP

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100 year flood line (where available or where it is required by DWS);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in Appendix A.

## 8. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this report. It must be supplemented with additional photographs of relevant features on the site, if applicable.

## 9. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of at least 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

## 10. ACTIVITY MOTIVATION

Motivate and explain the need and desirability of the activity (including demand for the activity):

<b>1. Is the activity permitted in terms of the property's existing land use rights?</b>	YES		
The construction of a pipeline does not affect the current land use rights.			
<b>2. Will the activity be in line with the following?</b>			
<b>(a) Provincial Spatial Development Framework (PSDF)</b>	YES		
The pipeline is required for the transportation of water in order to accommodate the need of potable water in Senekal.			
<b>(b) Urban edge / Edge of Built environment for the area</b>	YES		
The Urban Edge / Edge of Built Environment will not be impacted upon due to the proposed project.			
<b>(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).</b>	YES		
NOTE: The applicant of the proposed project is the Local Municipality itself. Therefore, the proposed project will be in line with the Municipal Plans for the area.			
<b>(d) Approved Structure Plan of the Municipality</b>	YES		
NOTE: The applicant of the proposed project is the Local Municipality itself. Therefore, the proposed project will be in line with the Municipal Plans for the area.			
<b>(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)</b>	YES		
NOTE: The applicant of the proposed project is the Local Municipality itself. Therefore, the proposed project will follow the integrity of the existing environmental management priorities for the area.			
<b>(f) Any other Plans (e.g. Guide Plan)</b>			
N/A			

3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	YES		
The proposed project is in line with the projects and programmes identified as priorities by the Local Municipality.			
4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)	YES		
A need exists to provide Senekal WTW with sufficient volume of potable water.			
5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	YES		
Adequate services are in place. Note that the applicant of the proposed project is the local municipality itself, therefore it is believed that no written confirmation is required from the municipality regarding the above.			
6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	YES		
The applicant is the local municipality itself.			
7. Is this project part of a national programme to address an issue of national concern or importance?	YES		
This project entails the construction of a pipeline in order to convey raw water to Senekal WTW.			
8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	YES		
The proposed project entails the construction of a pipeline in order to provide raw water to Senekal WTW.			
9. Is the development the best practicable environmental option for this land/site?	YES		
The engineers and specialists examined the site and concluded that the site is suitable for the proposed development and indeed the best environmental option.			



<b>10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?</b>	YES		
<p><b>Negative:</b></p> <ul style="list-style-type: none"> <li>• Vegetation loss;</li> <li>• Possible erosion;</li> <li>• Possible soil and groundwater pollution.</li> </ul> <p>These can be mitigated by implementing the mitigation measures in the EMPr, as well as good practices.</p> <p><b>Positive:</b></p> <ul style="list-style-type: none"> <li>• Employment opportunities;</li> <li>• Removal of various alien vegetation species;</li> <li>• Availability of sufficient volume of potable water in Senekal</li> </ul> <p>Thus, the positive impacts outweigh the negative impacts.</p>			
<b>11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?</b>	YES		
<p>It is suggested that future, similar projects will also:</p> <ul style="list-style-type: none"> <li>• Be located in a road reserve as far as possible</li> <li>• Be constructed in such a way that the impact on surface water bodies will be minimised</li> <li>• Be established on a site that is already disturbed, where possible</li> </ul>			
<b>12. Will any person's rights be negatively affected by the proposed activity/ies?</b>	YES		
<p>Noise levels may be high during the construction phase. The construction phase will also lead to the formation of nuisance dust. However, this will be limited via dust suppression activities (when required). In addition, construction activities will be limited to normal working hours, where possible. Noise levels will have to comply with the requirements as set out in the OSH Act.</p>			
<b>13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?</b>	YES		
<p>The proposed project will not have an impact on the urban edge as defined by the Local Municipality.</p>			
<b>14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?</b>	YES		
<p>SIP 18: Water and sanitation infrastructure. The proposed project entails the construction of a pipeline in order to provide water to Senekal</p>			
<b>15. What will the benefits be to society in general and to the local communities?</b>	Please explain		
<ul style="list-style-type: none"> <li>• Employment opportunities</li> <li>• Availability of potable water</li> </ul>			
<b>16. Any other need and desirability considerations related to the proposed activity?</b>	Please explain		
N/A			



<b>17. How does the project fit into the National Development Plan for 2030?</b>	Please explain
Availability of potable water	
<b>18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.</b>	

Section 23 of NEMA (Act 107, 27 November 1998) reads as follows:

'23. (1) The purpose of this Chapter is to promote the application of appropriate environmental management tools in order to ensure the integrated environmental management of activities,

(2) The general objective of integrated environmental management is to -

(a) promote the integration of the principles of environmental management set out in section 2 into the making of all decisions which may have a significant effect on the environment:

(b) identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimizing negative impacts, maximizing benefits and promoting compliance with the principles of environmental management set out in section 2;

(c) ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them;

(d) ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment;

(e) ensure the consideration of environmental attributes in management and decision-making which may have a significant effect on the environment; and

(f) identify and employ the modes of environmental management best suited to ensuring that a particular activity is pursued in accordance with the principles of environmental management set out in section 2.

(3) The Director-General must coordinate the activities of organs of state referred to in section 24(1) and assist them in giving effect to the objectives of this section and such assistance may include training, the publication of manuals and guidelines and the co-ordination of procedures.'

With the above in mind, the following objectives were taken into consideration:

1. An application for environmental authorisation was submitted to the Department.
2. Integration of various principles of environmental management were implemented in order to make decisions regarding the significant effect of the proposed project on the environment
3. Identified, predicted and evaluated the actual potential impact of the proposed project on the environment, the socio-economic conditions and heritage, as well as the consequences and alternatives and options for

- mitigation of activities. This was done to minimize the possible negative impacts on the environment and maximizing benefits to mankind.
4. Taken the effects of activities on the environment into consideration before actions are to be taken in connection with them.
  5. A public participation process was followed.
  6. Considered the environmental attributes in management and decision-making with reference to the environment.
  7. Mitigation and management activities best suited to ensuring that a particular activity is pursued in accordance with the principles of environmental management were investigated.
  8. The report follows the laws to identify, predict and evaluate the actual and potential impacts associated with the development.
  9. Specialists investigated the site to determine baseline and to predict the impacts associated with the proposed project. The preferred alternative has been identified as the one that will have the least negative impact on the environment, as sensitive areas will be avoided as far as possible. In addition, already disturbed areas will be utilized as far as possible.
  10. A public participation process was followed. Consideration of the 2014 EIA Regulations has been applied in this regards.
  11. An EMPr is included, with mitigation measures that should be implemented during the planning, construction, operation and possible decommissioning of the proposed project. These mitigation measures are in line with the environmental requirements and Best Practise Principles.
  12. Relevant guidelines and procedures were used to produce this document. Therefore, relevant information is reflected, for sufficient co-governance to be implemented.
  13. The proposed project provides for the needs of the applicant while ensure compliance with environmental management principles.

**19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.**

Section 2 of NEMA (Act 107, 27 November 1998) reads as follows:

( 1 ) The principles set out in this section apply throughout the Republic to the actions of all organs of state that may significantly affect the environment and—

(a) shall apply alongside all other appropriate and relevant considerations, including the State's responsibility to respect, protect, promote and fulfil the social and economic rights in Chapter 2 of the Constitution and in particular the basic needs of categories of persons disadvantaged by unfair discrimination;

(b) serve as the general framework within which environmental management and implementation plans must be formulated:

- (c) serve as guidelines by reference to which any organ of state must exercise any function when taking any decision in terms of this Act or any statutory provision concerning the protection of the environment;
  - (d) serve as principles by reference to which a conciliator appointed under this Act must make recommendations; and
  - (e) guide the interpretation, administration and implementation of this Act, and any other law concerned with the protection or management of the environment.
- (2) Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
- (3) Development must be socially, environmentally and economically sustainable.
- (4) (a) Sustainable development requires the consideration of all relevant factors including the following:
- (i) That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;
  - (ii) into account the limits of current knowledge about the consequences of decisions and actions; and
  - (iii) that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.
  - (iv) that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;
  - (v) that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;
  - (vi) that waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;
  - (vii) that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;
  - viii) that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised;
  - (ix) that a risk-averse and cautious approach is applied, which takes
- (b) Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.

- (c) Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.
- (d) Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination.
- (e) Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.
- (f) The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured.
- (g) Decisions must take into account the interest, needs and values of all the interested and affected parties, and this includes recognizing all forms of knowledge, including traditional and ordinary knowledge.
- (h) Community wellbeing and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.
- (i) The social, economic and environmental impacts of activities, including disadvantages and benefits must be considered, assessed and evaluated and decisions must be appropriate in the light of such consideration and assessment.
- j) The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.
- (k) Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.
- (l) There must be intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment.
- (m) Actual or potential conflicts of interest between organs of state should be resolved through conflict resolution procedures.
- (n) Global and international responsibilities relating to the environment must be discharged in the national interest.
- (o) The environment is held in public trust for the people. The beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.
- (p) The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.

(q) The vital role of women and youth in environment management and development must be recognised and their full participation therein must be promoted.

(r) Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.

The applicant of the proposed project took the following into consideration:

1. That the disturbance of ecosystems and loss of biological diversity are minimised and remedied by implementing the mitigation measures in this document, the EMPr as well as best practices.
2. Environmental management must be integrated
3. Adverse environmental impacts (if any) shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.
4. The participation of all interested and affected parties in environmental governance must be promoted by means of the public participation process that forms part of the basic assessment process.
5. Community wellbeing and empowerment must be promoted by providing employment opportunities during the construction as well as operational phase.
6. The right of workers to refuse work that is harmful to human health or the environment

## 11. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
National Environmental Management Act, 1998 (Act 107 of 1998)	Proposed construction of a pipeline	DESTEА	1998
National Heritage Resources Act (Act No 25 of 1999)	Proposed construction of a pipeline	SAHRA	1999
National Environmental Management Biodiversity Act, 2004 (Act 10 of 2004)	Proposed construction of a pipeline	DESTEА	2004
Environmental	Conservation of the	DEA / DESTEА	1989

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
Conservation Act (Act 73 of 1989)	environment, by implementing best practices		
National Environmental Management Biodiversity Act, 2004 (Act 10 of 2004)	Endangered / Vulnerable vegetation types and Protected Species (TOPS)	DEA / DESTEA	2004
Northern Cape Nature Conservation Act (Act 9 of 2009) (NCNCA)	Conservation of the environment, by implementing best practices	DEA / DESTEA	2009
National Forests Act (Act No. 84 of 1998) (NFA)	Conservation of protected trees (if any)	DAFF	1998
National Veld and Forest Fires Act, Act 101 of 1998 (NVFFA)	Mitigation measures to be implemented in case of a fire	DAFF	1998
NEM Laws Amendment Act Department (Act 25 of 2014)	Amended regulations for the Public Participation Process.	DEA / DESTEA	2014
Conservation of Agricultural Resources Act (Act 43 of 1983)	Agricultural land traversed by the pipeline (if any). Alien vegetation in and surrounding site.	DAFF	1983
National Water Act, 1998 (Act 36 of 1998)	Activities in proximity to 32m from watercourses.	DWS	1998

## 12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

### a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

If YES, what estimated quantity will be produced per month?

YES	
Unknown	m <sup>3</sup>

How will the construction solid waste be disposed of (describe)?



The contractor will be responsible for the disposal of waste generated during the construction phase. The contractor will remove the construction waste and dispose thereof at a suitable authorized landfill site.

Where will the construction solid waste be disposed of (describe)?

Solid waste disposal sites in Senekal. Hazardous waste (if any) should be disposed of at a suitable authorized hazardous landfill site such as Holfontein.

Will the activity produce solid waste during its operational phase? 

	NO
--	----

  
 If YES, what estimated quantity will be produced per month? 

	m <sup>3</sup>
--	----------------

  
 How will the solid waste be disposed of (describe)?

N/A

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

N/A

Where will the solid waste be disposed of if it does not feed into a municipal waste stream (describe)?

N/A

*If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.*

Can any part of the solid waste be classified as hazardous in terms of the NEM:WA? 

	NO
--	----

If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

Is the activity that is being applied for a solid waste handling or treatment facility? 

	NO
--	----

If YES, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

**b) Liquid effluent**

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system? 

	NO
--	----

  
 If YES, what estimated quantity will be produced per month? 

	m <sup>3</sup>
--	----------------

  
 Will the activity produce any effluent that will be treated and/or disposed of on site? 

	NO
--	----

*If YES, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.*

Will the activity produce effluent that will be treated and/or disposed of at another facility?

	NO
--	----

If YES, provide the particulars of the facility:

<b>Facility name:</b>			
<b>Contact person:</b>			
<b>Postal address:</b>			
<b>Postal code:</b>			
<b>Telephone:</b>		<b>Cell:</b>	
<b>E-mail:</b>		<b>Fax:</b>	

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

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### c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other than exhaust emissions and dust associated with construction phase activities?

	NO
--	----

If YES, is it controlled by any legislation of any sphere of government?

	NO
--	----

If YES, the applicant must consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If NO, describe the emissions in terms of type and concentration:

- The emissions associated with the proposed activity can be described as general vehicle emissions and dust formation during the construction phase of the project.
- Construction activities will be limited to day time hours, where possible.
- In addition, dust can also be seen as a potential issue during construction due to blasting activities.
- This will be temporary and the formation of dust will be controlled, when necessary.
- A blasting permit will be obtained before blasting activities is undertaken.
- Adjacent landowners will be notified of proposed blasting 24 hours prior to blasting activities.
- Generation of dust may also occur during general maintenance work, during the operational phase.

### d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA?

	NO
--	----

If YES, please submit evidence that an application for a waste permit has been submitted to the competent authority



**e) Generation of noise**

Will the activity generate noise?

YES	
	NO

If YES, is it controlled by any legislation of any sphere of government?

Describe the noise in terms of type and level:

- Noise associated with the development activities will be from general vehicular activities as well as construction activities including blasting, when required.
- Heavy vehicles will be equipped with silencers.
- A blasting permit will be obtained before blasting activities is undertaken.
- The adjacent landowners will be notified of proposed blasting 24 hours prior to blasting activities.
- In addition, construction activities will be limited to day time hours, where possible.
- Additional noise may be generated during the operational phase when maintenance work is required.
- Noise levels will have to comply with the requirements as set out in the OHS Act.

**13. WATER USE**

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

Municipal	Water board	Groundwater	River, stream, dam or lake	Other	The activity will not use water
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If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?

	litres
YES	

If YES, please provide proof that the application has been submitted to the Department of Water Affairs.

**NOTE:**

An application to DWS, for the impeding and / or alteration of beds / banks of water course(s) will be submitted in due course.

Water will be abstracted from the Sand River and Sand Spruit. Please note that the abstraction points are already in operation and does not form part of the scope of works of the current project. The water abstracted from the above mentioned sources will be transported by the proposed new pipeline (current project). The water will be purified for municipal (domestic) use.

**14. ENERGY EFFICIENCY**

Describe the design measures, if any, which have been taken to ensure that the activity is energy efficient:

N/A

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

N/A

**SECTION B: SITE/AREA/PROPERTY DESCRIPTION****Important notes:**

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section B and indicate the area, which is covered by each copy No. on the Site Plan.

Section B Copy No. (e.g. A):

2. Paragraphs 1 - 6 below must be completed for each alternative.

3. Has a specialist been consulted to assist with the completion of this section?  YES
- If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.

**Property description/physical address:**

<b>Province</b>	Free State
<b>District Municipality</b>	Thabo Mofutsanyana District Municipality
<b>Local Municipality</b>	Setsoto Local Municipality
<b>Ward Number(s)</b>	3, 4, 6

<b>Ward Number</b>	4
<b>Farm name and number</b>	Zyfer Fontein RE/246
<b>Portion number</b>	4
<b>SG Code</b>	F 030 000 000 000 246 000 00
<b>Current land-use zoning as per local municipality IDP/records:</b>	Municipal

<b>Ward Number</b>	4
<b>Farm name and number</b>	Zyfer Fontein 4/246
<b>Portion number</b>	4
<b>SG Code</b>	F 030 000 000 000 246 000 04
<b>Current land-use zoning as per local municipality IDP/records:</b>	Agriculture

<b>Ward Number</b>	4
<b>Farm name and number</b>	Uitkomst RE/513
<b>Portion number</b>	Remainder
<b>SG Code</b>	F 030 000 000 000 513 000 00
<b>Current land-use zoning as per local municipality IDP/records:</b>	Agriculture

<b>Ward Number</b>	4
<b>Farm name and number</b>	De Wildt RE/1056
<b>Portion number</b>	Remainder
<b>SG Code</b>	F 030 000 000 001 056 000 00
<b>Current land-use zoning as per local municipality IDP/records:</b>	Agriculture

<b>Ward Number</b>	4
<b>Farm name and number</b>	Koekemoers Rekwes 1/104
<b>Portion number</b>	
<b>SG Code</b>	F 030 000 000 000 104 000 01
<b>Current land-use zoning as per local municipality IDP/records:</b>	Agricultural Holdings

<b>Ward Number</b>	4
<b>Farm name and number</b>	Sterrewag Re/314
<b>Portion number</b>	Remainder
<b>SG Code</b>	F 030 000 000 000 314 000 00
<b>Current land-use zoning as per local municipality IDP/records:</b>	Agriculture

<b>Ward Number</b>	4
<b>Farm name and number</b>	Colac 2/292
<b>Portion number</b>	2
<b>SG Code</b>	F 030 000 000 000 292 000 02
<b>Current land-use zoning as per local municipality IDP/records:</b>	Agriculture

<b>Ward Number</b>	4
<b>Farm name and number</b>	Cango RE/1259
<b>Portion number</b>	Remainder
<b>SG Code</b>	F 030 000 000 001 259 000 00
<b>Current land-use zoning as per local municipality IDP/records:</b>	Agriculture

<b>Ward Number</b>	4
<b>Farm name and number</b>	Cango "A" RE/320
<b>Portion number</b>	Remainder
<b>SG Code</b>	F 030 000 000 000 320 000 00
<b>Current land-use zoning as per local municipality IDP/records:</b>	Agriculture

<b>Ward Number</b>	3, 4 & 6
<b>Farm name and number</b>	De Put RE/298
<b>Portion number</b>	Remainder
<b>SG Code</b>	F 030 000 000 000 298 000 00
<b>Current land-use zoning as per local municipality IDP/records:</b>	Municipal

**Current land-use zoning as per local municipality IDP/records:**

Please refer to section above. Please note that the proposed pipeline will be constructed within servitudes, on the above mentioned properties.

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

Is a change of land-use or a consent use application required?

NO

## 1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

**Alternative 1** Preferred – Sections near the watercourse:

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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**Alternative 1** Preferred – Sections near the reservoir – koppie slope:

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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**Alternative 1** Preferred – Sections near the road:

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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## 2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

2.1 Ridgeline	<input type="checkbox"/>	2.4 Closed valley	<input type="checkbox"/>	2.7 Undulating plain / low hills	<input type="checkbox"/>
2.2 Plateau	<input checked="" type="checkbox"/>	2.5 Open valley	<input type="checkbox"/>	2.8 Dune	<input type="checkbox"/>
2.3 Side slope of hill/mountain	<input checked="" type="checkbox"/>	2.6 Plain	<input checked="" type="checkbox"/>	2.9 Seafront	<input type="checkbox"/>
2.10 At sea	<input type="checkbox"/>				

## 3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following?

	Alternative 1 Preferred:	
Shallow water table (less than 1.5m deep)	YES	<input type="checkbox"/>
Dolomite, sinkhole or doline areas		NO <input type="checkbox"/>
Seasonally wet soils (often close to water bodies)	YES	<input type="checkbox"/>
Unstable rocky slopes or steep slopes with loose soil	YES	<input type="checkbox"/>
Dispersive soils (soils that dissolve in water)		NO <input type="checkbox"/>
Soils with high clay content (clay fraction more than 40%)		NO <input type="checkbox"/>
Any other unstable soil or geological feature		NO <input type="checkbox"/>
An area sensitive to erosion	YES	<input type="checkbox"/>

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted.

## 4. GROUNDCOVER

Indicate the types of groundcover present on the site. The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Natural veld - good condition <sup>E</sup>	Natural veld with scattered aliens <sup>E</sup>	Natural veld with heavy alien infestation <sup>E</sup>	Veld dominated by alien species <sup>E</sup>	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an "E" is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

**Summary of Ecological Report:**

The majority of vegetation along the pipeline route has been transformed with smaller portions of natural vegetation remaining though also disturbed to some degree. Two areas of significant conservation value are the portion of natural grassland to the south of the Cyferfontein dam and the sandstone hill in the town of Senekal. The natural grassland is situated within the Eastern Free State Clay Grassland, a Threatened Ecosystem, and therefore of high conservation value. In this portion the construction of the pipeline should keep the footprint and clearance of vegetation to a minimum. The hill also contains elements of high conservation value. Areas of exposed sandstone represent a unique habitat and contain areas similar to vernal pools. Furthermore, and of higher sensitivity is the steep southern slope which contains a dense tree and shrub cover. The footprint and clearance of vegetation should also be kept to a minimum in these areas. Furthermore, the pipeline should also be installed on top of the soil surface or semi-imbedded much the same as the existing pipeline. In addition to the above, these areas contain several protected species. Where any of the geophytic species will be affected the necessary permits should be obtained to transplant them to adjacent areas.

The pipeline route crosses several watercourses of which the majority are seasonal streams and drainage lines and occurs within close proximity to the Sand River. The only significant watercourse along the pipeline route is the Sand River and although it will not be crossed by the pipeline, pipeline crossings will occur within close proximity to it. Furthermore, all the affected watercourses drain into this river and is therefore taken as representative of all the watercourses being crossed.

The Sand River and associated tributaries which will be affected by the pipeline is still natural to a significant extent although moderately modified by large impacts associated with dryland crop cultivation and urban development. An Index of Habitat Integrity (IHI) was conducted and indicated that the watercourses have an Instream and Riparian IHI of Category C: Moderately Modified.

The EI&S of the Sand River and associated tributaries has been rated as being Moderate: Floodplains that are considered to be ecologically important and sensitive on a provincial or local scale. The biodiversity of these floodplains is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water of major rivers.

The Sand River and associated tributaries has been affected by several



significant impacts which has caused moderate modification of these systems. The river has been affected by two large off-channel storage dams and associated weirs which would undoubtedly have altered the flow and flooding regime. The extensive agricultural crop cultivation and urban area of Senekal has also contributed significant impacts on water quality, sediment load and geomorphology of the river.

The pipeline will roughly follow the Sand River and although it will not cross the river, will occur in close proximity to it. The pipeline will therefore not have any direct impacts on the river but may affect it indirectly. The installation of the pipeline will require the removal of vegetation, disturbance of the soil surface and excavation of material. This will form a source of sediment which may be washed into the river and increase the sediment load. The storage of stockpiles should therefore occur outside the floodplain of the river and stockpiles protected against erosion. Stockpiles and materials should also be placed in the sequence; watercourse-trench-stockpile. This will ensure that sediment is kept away from the watercourse and the trench acts as barrier. The pipeline may also occur within the floodplain of the river in some areas. It is evident that the floodplain is subjected to significant erosion. As a result the pipeline installation may increase the erosion potential and it is therefore important that adequate mitigation be implemented to prevent any erosion from taking place. Adequate monitoring and remediation of erosion should be implemented.

Where the tributaries require crossing by the pipeline more substantial impacts will result. The installation of the pipeline will result in the disturbance of the bed and banks of the watercourses. This in turn will promote erosion, prevent the banks from stabilising and lead to increased sedimentation of the watercourses. As a result disturbance of the banks should be kept to a minimum and erosion remediated where it occurs. Removal of vegetation should also be kept to a minimum. The disturbance caused by construction will also cause susceptible conditions for further establishment of exotics. It is therefore recommended that weed eradication be initiated at the crossing sites prior to construction and continued until rehabilitation of the pipeline route has been completed. When excavating in watercourses the upper 30 cm, or topsoil, should be removed together with the vegetation and stored as sods on the site. These should then be replaced on top of the installed pipeline. Subsoil should be used as backfilling and not as top dressing. Only removed sods and topsoil should be utilised to rehabilitate the bed and bank surface. The soil surface should also be re-instated to the virgin soil level and not depressed or elevated as this will promote erosion and cause flow barriers. After rehabilitation any excess soil or material should be removed and disposed of at a registered disposal facility. Installation of the pipeline through the watercourses should preferably be undertaken during the winter

months (July to September) when baseflow will be at its lowest level.

## 5. SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites?

Perennial River	YES		
Non-Perennial River	YES		
Permanent Wetland		NO	
Seasonal Wetland		NO	
Artificial Wetland		NO	
Estuarine / Lagoonal wetland		NO	

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

Sandspruit – Perennial
Sand River – Perennial
Tributaries to the Sandspruit or Rand River – Non-Perennial

## 6. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

Natural area	Dam or reservoir	Polo fields
Low density residential	Hospital/medical centre	Filling station <sup>H</sup>
Medium density residential	School	Landfill or waste treatment site
High density residential	Tertiary education facility	Plantation
Informal residential <sup>A</sup>	Church	Agriculture
Retail commercial & warehousing	Old age home	River, stream or wetland
Light industrial	Sewage treatment plant <sup>A</sup>	Nature conservation area
Medium industrial <sup>AN</sup>	Train station or shunting yard <sup>N</sup>	Mountain, koppie or ridge
Heavy industrial <sup>AN</sup>	Railway line <sup>N</sup>	Museum
Power station	Major road (4 lanes or more) <sup>N</sup>	Historical building
Office/consulting room	Airport <sup>N</sup>	Protected Area
Military or police base/station/compound	Harbour	Graveyard
Spoil heap or slimes dam <sup>A</sup>	Sport facilities	Archaeological site
Quarry, sand or borrow pit	Golf course	Other land uses (describe)

If any of the boxes marked with an "N" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

N/A

If any of the boxes marked with an "An" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

N/A

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

N/A

Does the proposed site (including any alternative sites) fall within any of the following:

Critical Biodiversity Area (as per provincial conservation plan)		NO
Core area of a protected area?		NO
Buffer area of a protected area?		NO
Planned expansion area of an existing protected area?		NO
Existing offset area associated with a previous Environmental Authorisation?		NO
Buffer area of the SKA?		NO

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

## 7. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain:

NO

If uncertain, conduct a specialist investigation by a recognised specialist in the field (archaeology or palaeontology) to establish whether there is such a feature(s) present on or close to the site. Briefly explain the findings of the specialist:

**NOTE:**

A heritage specialists visited the site and no culturally or historically significant elements were observed on site.  
Please refer to Appendix D<sub>1</sub> for more information.

Will any building or structure older than 60 years be affected in any way?

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.

	NO
	NO

## 8. SOCIO-ECONOMIC CHARACTER

### a) Local Municipality

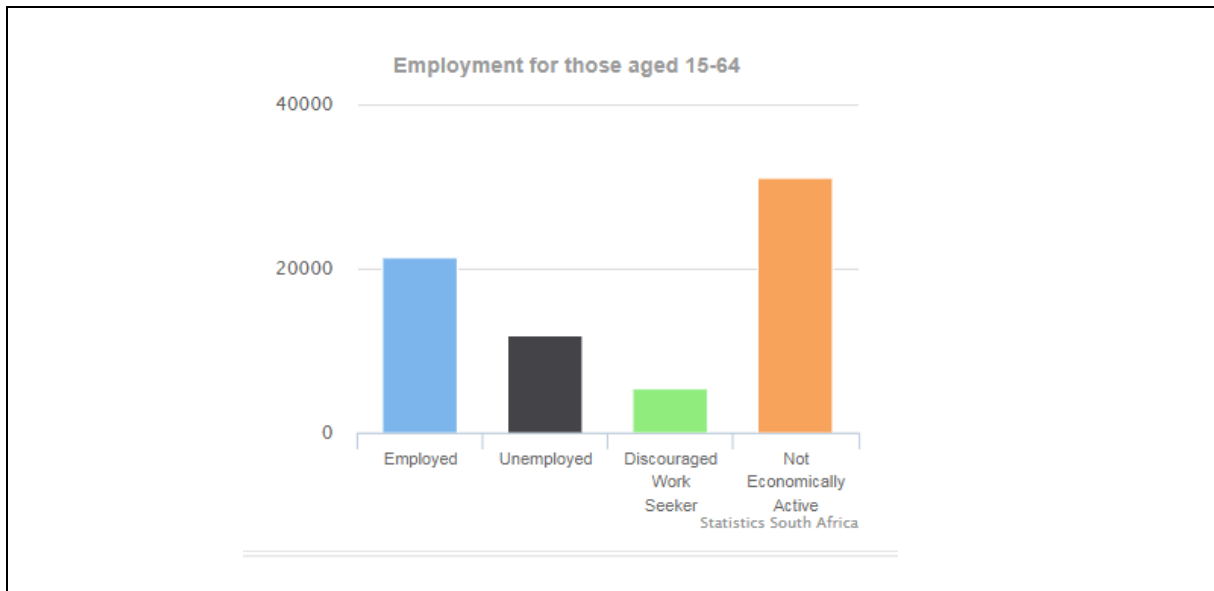
Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

#### NOTE:

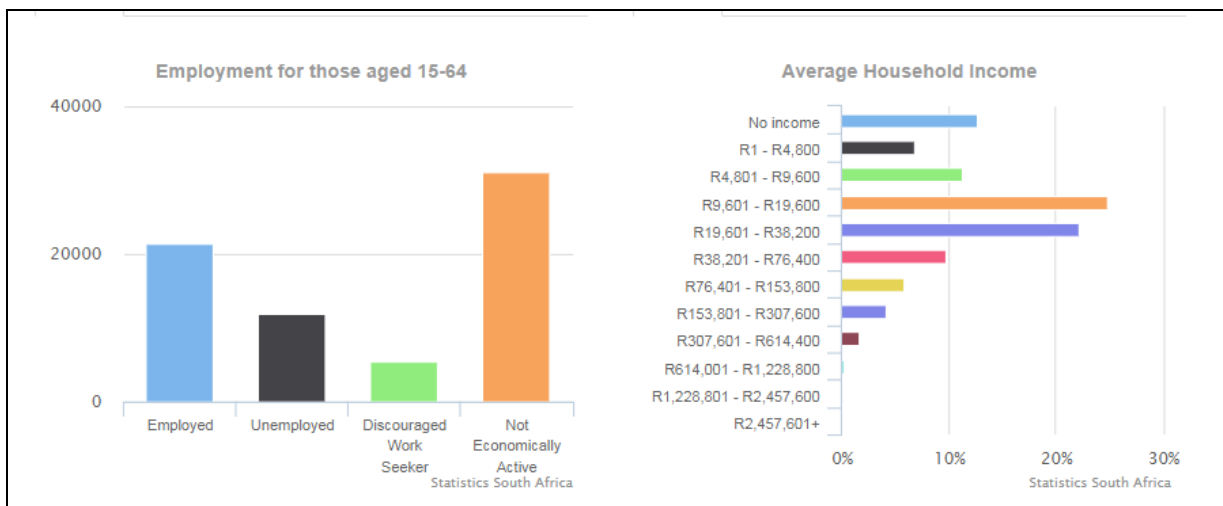
According to Census 2011, Setsoto Local Municipality has a population of 110 335, of whom 92,3% are black African, 5,7% are white, with the remaining 2% made up by other population groups. The majority of the population, that is 62%, is between 15 and 64 years of age. The age group 0 to 14 years accounts for 32% of the population. Of those aged 20 years and above, approximately 8,7% have no formal schooling, 22,6% have completed matric, and 6,9% have some form of higher education.

According to Census 2011, the town Senekal has a total population of 3 466 people, of whom 53,0% are black African, 1,4% are coloured, 42,8% are white and 1,7% are Indian/Asian. The other population groups make up the remaining percentages.

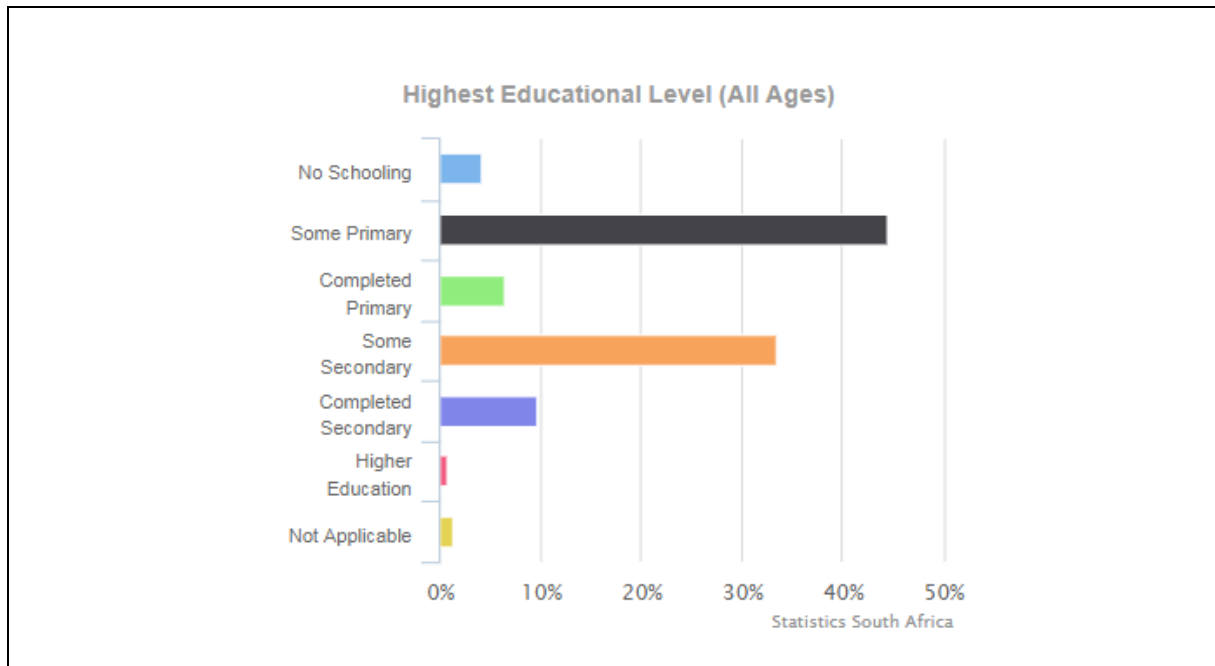
Level of unemployment:



Economic profile of local municipality:



Level of education:



**b) Socio-economic value of the activity**

- What is the expected capital value of the activity on completion?
- What is the expected yearly income that will be generated by or as a result of the activity?
- Will the activity contribute to service infrastructure?
- Is the activity a public amenity?
- How many new employment opportunities will be created in the development and construction phase of the activity/ies?
- What is the expected value of the employment opportunities during the development and construction phase?
- What percentage of this will accrue to previously disadvantaged individuals?
- How many permanent new employment opportunities will be created during the operational phase of the activity?
- What is the expected current value of the employment opportunities during the first 10 years?
- What percentage of this will accrue to previously disadvantaged individuals?

Unknown	
Unknown	
YES	
YES	
Unknown	
Unknown	
Unknown	
Unknown	
Unknown	
Unknown	

**9. BIODIVERSITY**

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult <http://bgis.sanbi.org> or [BGIShelp@sanbi.org](mailto:BGIShelp@sanbi.org). Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/

EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix D to this report.

- a) **Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)**

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
Critical Biodiversity Area (CBA)	Ecological Support Area (ESA)	Other Natural Area (ONA)	No Natural Area Remaining (NNR)	The pipeline route falls within an Ecological Support Area 2 category with small areas of Degraded and Other categories under the Free State Province Biodiversity Management Plan (2015)

- b) **Indicate and describe the habitat condition on site**

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).
Natural	10%	The majority of natural vegetation along the pipeline route has been transformed by dryland crop cultivation and urban development and together with this the ecological function has also been altered to a large degree. Portions of remaining natural still sustain the threatened Eastern Free State Clay Grassland and these areas therefore still have an important ecological function.
Near Natural (includes areas with low to moderate level of alien invasive plants)	20%	The area is subjected to extensive dryland crop cultivation, especially along the northern section of the pipeline route, and this would undoubtedly also contribute significant impacts on the river. These fields clear the natural vegetation and significantly contributes to increased runoff

		<p>velocity which in turn increases erosion and sedimentation of watercourses. Also associated with this is fertiliser, pesticide and herbicide runoff and its effect on water quality.</p> <p>The northern section of the pipeline route also contains numerous exotic trees which dominate in some areas. This decreases species diversity and degrades the available habitat. It is also likely to affect the baseflow as a result of high evapotranspiration.</p>
Degraded (includes areas heavily invaded by alien plants)	30%	<p>The river and surrounding catchment is subjected to high levels of overgrazing. This significantly decreases vegetation cover which in turn increases runoff velocity and erosion which increases the sediment load within the Sand River. Trampling will also disturb the soil surface and further increase sediment load in the river. In addition, manure will increase the nutrient load within the river.</p>
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	40%	<p>The majority of natural vegetation along the pipeline route has been transformed by dryland crop cultivation and urban development and together with this the ecological function has also been altered to a large degree. Portions of remaining natural still sustain the threatened Eastern Free State Clay Grassland and these areas therefore still have an important ecological function</p>

**c) Complete the table to indicate:**

- (i) the type of vegetation, including its ecosystem status, present on the site; and
- (ii) whether an aquatic ecosystem is present on site.

Terrestrial Ecosystems		Aquatic Ecosystems		
Ecosystem threat status as per the National	Critical	Wetland (including rivers, depressions, channelled and unchannelled wetlands, flats,	Estuary	Coastline
	Endangered			
	Vulnerable			



Terrestrial Ecosystems		Aquatic Ecosystems						
Environmental Management: Biodiversity Act (Act No. 10 of 2004)	Least Threatened	seeps pans, and artificial wetlands)						
		YES				NO		NO

- d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)

According to Mucina & Rutherford (2006) the area consists of Eastern Free State Clay Grassland (Gm 3) and Central Free State Grassland (Gh 6). Of these the latter is listed as being of Least Concern (LC) whilst the former is listed as being Vulnerable (VU) and therefore a Threatened Ecosystem according to the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).

The pipeline route differs considerably in terms of vegetation cover along the route. The northern portion from the Cyferfontein dam to the Koekemoers Rekwest Small Holdings is primarily situated within an agricultural area. The natural vegetation has largely been transformed by dryland crop cultivation with only small portions of natural vegetation remaining. The central portion of the pipeline route is situated within the urban area of Senekal and here disturbance is high and natural vegetation has mostly been transformed, except for the prominent hill which although degraded still consists largely of natural vegetation. The pipeline section to the south and west of the town is situated in close proximity to the urban area of Matwabeng and here disturbance and transformation of the natural vegetation is also high.

**SECTION C: PUBLIC PARTICIPATION****1. ADVERTISEMENT AND NOTICE**

<b>Publication name</b>	Die Volksblad	
<b>Date published</b>	2 May 2018	
<b>Site notice position</b>	<b>Latitude</b>	<b>Longitude</b>
	28°17'45.60"S	27°38'1.13"E
<b>Date placed</b>	2 May 2018 & 18 March 2019	

Include proof of the placement of the relevant advertisements and notices in Appendix E1.

**2. DETERMINATION OF APPROPRIATE MEASURES**

Provide details of the measures taken to include all potential I&APs as required by Regulation 41(2)(e) and 41(6) of GN 326

Key stakeholders (other than organs of state) identified in terms of Regulation 41(2)(b) of GN 326

<b>Title, Name and Surname</b>	<b>Affiliation/ key stakeholder status</b>	<b>Contact details (tel number or e-mail address)</b>
Thabo Mofutsanyana District Municipality	The Municipal Manager	Ms. Takatso Lebenya Tel: (058) 718 1036 / 1089 Fax: (058) 718 1034 Email: takatso@tmdm.gov.za  Private Bag X810, Witsieshoek, 9870  1 Mampoi Street, Old Parliament Building, Phuthaditjhaba
Setsoto Local Municipality	Municipal Manager	Mr. Tshepiso "Sugar" Ramakarane  Tel: (+27 51) 933 9302 Fax: (+27 51) 933 9363 Email: tshepiso@setsoto.co.za and manager@setsoto.co.za  27 Voortrekker Street, Ficksburg  PO Box 116, Ficksburg, 9730

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
Setsoto Local Municipality: Ward Councillors: Wards 3, 4 & 6	Ward 3: Cllr. Mamotena Lydia Mthimkulu Ward 4:Cllr. Mahlomola Ralehlatsi Ward 6: Cllr.Motsamai Selasi	27 Voortrekker Street, Ficksburg  PO Box 116, Ficksburg, 9730
Head of Department: Roads and Public Works	Mr Willie Naude	Medfontein Building 155 St Andrew Street P.O. Box 119 Bloemfontein 9300
Head of Department: Agriculture	The Assistant Director	P.O. Box 34521 Faunasig Bloemfontein 9325
Department of Public Works: Property Manager	Ms Agnes Ntilane (Strategic Asset Management – Property Portfolio)	Provincial Government of the Free State Department of Land Affairs Director Property Management of the Provincial Department of Public Works & Infrastructure Ms Agnes Ntilane 136 Charlotte Mareka Street Bloemfontein 9300 Ntilanea@fsworks.gov.za
Department of Water and Sanitation	Mr Masia Mgwambani The Director: Water Regulation in the Free State  Mr. W Grobler	Private Bag X528 Bloemfontein 9300 mgwambanim@dwaf.gov.za  GroblerW@dws.gov.za
SAHRA		South African Heritage Resources Agency (SAHRA) Head Office

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
		111 Harrington Street CAPE TOWN 8001
SAHRA Free State	Heritage Coordinator	Ntando PZ Mbatha Corner Henry and East Burger Street Department of Sport Arts Culture and Recreation Office 204 Bloemfontein 9301
SANRAL (Crossing the N5 Road)	Statutory Control: Eastern Region	Statutory Control: Eastern Region 58 Van Eck Place Mkondeni Pietermaritzburg 3201
ESKOM	Land and Rights Officer  Environmental Officer	Phindi Rapudungoane Land and Rights Officer Tell: 051 4042284 Fax: 086 5398399 Phindi.Rapudungoane@eskom.co.za  Mahlatse Moeng Environmental Officer Land Development and Environment Eskom Distribution-FSOU Eskom Centre First Floor 120 Henry Street Westdene Bloemfontein Tel: 051 404 2287 Cell: 079 199 0679 Fax: 086 604 5709 Email: Mahlatse.Moeng@eskom.co.za

Include proof that the key stakeholder received written notification of the proposed activities as Appendix E2. This proof may include any of the following:

- e-mail delivery reports;
- registered mail receipts;
- courier waybills;

- signed acknowledgements of receipt; and/or
- or any other proof as agreed upon by the competent authority.

### 3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summary of main issues raised by I&APs	Summary of response from EAP
<p><b><u>Altus Visagie:</u></b> Requested additional information on the said project. Did not register as an IAP to date</p>	<p>An e-mail with additional information was forwarded. Mr Visagie thanked MDA for the additional information.</p>
<p><b><u>Ms Smith:</u></b> Requested additional information on the said project. Did not register as an IAP to date</p>	<p>An e-mail with additional information was forwarded.</p>
<p><b><u>Dr Redelstorff (SAHRA):</u></b></p> <ol style="list-style-type: none"> <li>1. Should any objects of archaeological or palaeontological remains be found during construction activities, work must immediately stop in that area and the Environmental Control Officer (ECO) must be informed.</li> <li>2. The ECO must inform the South African Heritage Recourse Agency (SAHRA) and contact an archaeologist and/or palaeontologist, depending on the nature of the find, to assess the importance and rescue them if necessary (with the relevant SAHRA permit). No work may be resumed in this area without the permission from the ECO and SAHRA.</li> <li>3. If the newly discovered heritage resource is considered significant a Phase 2 assessment may be required. A permit from the responsible heritage authority will be needed.</li> <li>4. A Chance Finds Procedures must be developed for the project to</li> </ol>	<p>Please refer to Page 30 of the EMPr (Appendix G). Copies of the dBAR &amp; fBAR were forwarded to all registered IAPs.</p>

<p>ensure that standard protocols and steps are followed should any heritage and/or fossil resources be uncovered during all phases of the project. These procedures should outline the steps and reporting structure to be followed in the instance that heritage resources are found. This must be included in the Environmental Awareness Plan.</p> <p>5. The final BAR and appendices must be submitted to SAHRA upon submission to DEA. Should the project be granted Environmental Authorisation, SAHRA must be notified and all relevant documents submitted to the case file.</p>	
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#### 4. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments received from I&APs and respond to each comment before the Draft BAR is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to the Final BAR as Appendix E3.

#### 5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
Thabo Mofutsanyana District Municipality	Municipal Manager Ms. Takatso Lebenya	(058) 718 1036 / 1089	(058) 718 1034	takatso@tmdm.gov.za	Private Bag X810, Witsieshoek, 9870
Setsoto Local Municipality:	Municipal Manager Mr. Tshepiso	(051) 933 9302	(051) 933 9363	tshepiso@setsoto.co.za and manager	PO Box 116, Ficksburg, 9730

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
Municipal Manager	"Sugar" Ramakara ne			@setsoto.co.za	
Setsoto Local Municipality: Ward Councillor: Ward3, 4, 6	Ward 3: Cllr. Mamotena Lydia Mthimkulu Ward 4: Cllr. Mahlomola Ralehlatsi Ward 6: Cllr. Motsamai Selasi	(051) 933 9302	(051) 933 9363		PO Box 116, Ficksburg, 9730
Head of Department: Roads and Public Works	Head of Department Mr Willie Naude				P.O. Box 119 Bloemfontein 9300
Head of Department: Agriculture	The Assistant Director				P.O. Box 34521 Faunasig Bloemfontein 9325
Department of Public Works: Property Manager	Ms Agnes Ntilane (Strategic Asset Management – Property Portfolio)				
Department of Water and Sanitation	The Director: Water Regulation			mgwambanim@dwaf.gov.za	Private Bag X528 Bloemfontein 9300

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
	in the Free State Mr Masia Mgwambani				
SAHRA	South African Heritage Resources Agency (SAHRA) Head Office				111 Harrington Street CAPE TOWN 8001
SAHRA Free State	Heritage Coordinator Ntando PZ Mbatha				Corner Henry and East Burger Street Department of Sport Arts Culture and Recreation Office 204 Bloemfontein 9301
SANRAL (Crossing the N5 Road)	Statutory Control: Eastern Region				58 Van Eck Place Mkondeni Pietermaritzburg 3201
ESKOM	Land and Rights Officer And Environmental Officer	051 404 2287	086 604 5709	Phindi.Rapudungoane@eskom.co.za  Mahlatse.Moeng@eskom.co.za	Eskom Distribution-FSOU Eskom Centre First Floor 120 Henry Street Westdene Bloemfontein 9300



Include proof that the Authorities and Organs of State received written notification of the proposed activities as appendix E4.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

## **6. CONSULTATION WITH OTHER STAKEHOLDERS**

Note that, for any activities (linear or other) where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub-regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs must be included as appendix E5.

Copies of any correspondence and minutes of any meetings held must be included in Appendix E6.

## SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014 as amended and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

### 1. **IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES**

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A(2) of this report.

Compliance and Monitoring			
Activity	Impact summary	Significance	Proposed mitigation
Record keeping of compliance and monitoring reports	<b>Direct impacts:</b> <ul style="list-style-type: none"> <li>• Non-conformance</li> </ul>	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	<ul style="list-style-type: none"> <li>• The applicant will ensure that the contractors adhere to the recommendations of the EMP and conditions of the Environmental Authorisation during construction.</li> <li>• An Environmental Control Officer (ECO) will be appointed to monitor the construction phase. Note that the ECO may be appointed separately or can be part of the contractor's team.</li> <li>• Regular monitoring and / or spot inspections at least every fortnight during the construction phase is recommended.</li> <li>• Inspections should be documented and any shortcomings addressed immediately.</li> <li>• A report will be provided by the independent ECO to the contractor upon completion thereof. The findings thereof should be made available to the competent authority (for example DESTEA, DWS), should it be requested.</li> <li>• Any emergency or unforeseen impact will be reported to the relevant environmental department within 24 hours after</li> </ul>
	<b>Indirect impacts:</b> <ul style="list-style-type: none"> <li>• Non-conformance</li> </ul>	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	
	<b>Cumulative impacts:</b> <ul style="list-style-type: none"> <li>• Non-conformance</li> </ul>	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	

Compliance and Monitoring			
Activity	Impact summary	Significance	Proposed mitigation
			<p>identification for telephonic approval and will be confirmed in writing.</p> <ul style="list-style-type: none"> <li>• During the operational phase the pipeline and associated infrastructure must be routinely audited and maintenance schedule adjusted accordingly in order to prevent leakage.</li> <li>• Material Safety Data Sheets (MSDS) should be available on site. Where possible and available, MSDS should include information on ecological impacts and measures to minimize negative environmental impacts during accidental releases or escapes.</li> <li>• Procedures in the MSDS should be implemented in case of an emergency</li> <li>• The following documents should be available on site, and made available to the competent authority on request (if applicable): <ul style="list-style-type: none"> <li>- Complaints Register</li> <li>- Environmental Incident Register</li> <li>- Disposal Certificates of waste generated during the construction / operational phase</li> <li>- Disposal Certificates of waste generated</li> </ul> </li> </ul>

Compliance and Monitoring			
Activity	Impact summary	Significance	Proposed mitigation
			as a result of the construction activities. - Environmental Monitoring (Audit) Reports - Written Corrective Action Instructions - Environmental Authorisation - DWS Permit / License - Blasting Permit - EMPr

Planning and Design phase			
Activity	Impact summary	Significance	Proposed mitigation
Planning and design  <b>NOTE:</b> Should the following aspects not be taken into consideration during the Planning and Design Phase, the environmental impacts associated with the construction and operation phase will be of high significance as the environment will be negatively affected.	<b>Direct impacts:</b> <ul style="list-style-type: none"> <li>• None</li> </ul>	<b>Without Mitigation:</b> Medium - High Negative  <b>With Mitigation:</b> Low Negative	<ul style="list-style-type: none"> <li>• No environmental mitigation measures are required during the planning phase on the proposed site, as no mitigation measures are to be implemented on site during the planning phase.</li> <li>• However, the applicant, engineers, environmental consultants and specialists should take the following steps during the planning phase:                             <ul style="list-style-type: none"> <li>- Permits will be obtained for the removal / transplantation of protected species (if any) that are located within the construction area where no alternatives are possible.</li> <li>- A monitoring system should be implemented to determine the occurrence (if any) of any fuel / oil spillages during the construction phase.</li> <li>- The necessary Environmental Authorisation will be obtained before any activities listed in the Regulations are undertaken.</li> <li>- In addition, the necessary DWS registrations will be obtained, before any construction activities near watercourses</li> </ul> </li> </ul>
	<b>Indirect impacts:</b> <ul style="list-style-type: none"> <li>• Soil and surface water pollution</li> </ul>	<b>Without Mitigation:</b> Medium - High Negative  <b>With Mitigation:</b> Low Negative	
	<b>Cumulative impacts:</b> <ul style="list-style-type: none"> <li>• Groundwater pollution</li> </ul>	<b>Without Mitigation:</b> Medium - High Negative  <b>With Mitigation:</b> Low Negative	

Planning and Design phase			
Activity	Impact summary	Significance	Proposed mitigation
			<p>are undertaken.</p> <ul style="list-style-type: none"><li>- The necessary precautions with regard to road safety will be implemented for construction work to be undertaken within road crossings (if any).</li><li>- Proper sanitation, potable water and waste facilities will be in place before construction activities are undertaken.</li><li>- A blasting permit will be obtained before blasting activities is undertaken (if any).</li><li>- The design and layout of the proposed project will take the possibility of flooding, erosion and pollution into consideration.</li></ul>

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
General measures to consider	<b>Direct impacts:</b> <ul style="list-style-type: none"> <li>• Loss of vegetation</li> <li>• Loss of animal life</li> <li>• Erosion</li> <li>• Pollution</li> <li>• Noise</li> <li>• Nuisance dust</li> </ul>	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	<ul style="list-style-type: none"> <li>• Any construction is disruptive and the environment must be given consideration with every activity undertaken</li> <li>• All relevant standards relating to legislation should be adhered to (including waste emissions, waste disposal, noise regulations, etc.)</li> <li>• According to Section 28 of the NEMA Act 107, every person who cause, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring and if it can't be avoided or stopped, to minimize and rectify such pollution or degradation of the environment.</li> <li>• The pollution control provision in Section 19(1) of the National Water Act (Act 36 of 1998) should be adhered to at all times.</li> <li>• ECO should be provided with a layout of the site, indicating the position of the following prior to the site establishment, for acceptance:</li> </ul>
	<b>Indirect impacts:</b> <ul style="list-style-type: none"> <li>• Possible outbreaks of fire</li> <li>• Pollution (groundwater, surface water, soil and air)</li> <li>• Erosion</li> <li>• Loss of biodiversity (vegetation &amp; animal life)</li> <li>• Nuisance dust</li> </ul>	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	
	<b>Cumulative impacts:</b> <ul style="list-style-type: none"> <li>• Possible outbreaks of fire</li> <li>• Pollution (groundwater, surface water, soil and air)</li> </ul>	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	



Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	<ul style="list-style-type: none"> <li>• Erosion</li> <li>• Loss of biodiversity (vegetation &amp; animal life)</li> </ul>		<ul style="list-style-type: none"> <li>- Ablution Facilities</li> <li>- Storage Areas</li> <li>- Ready-mix Areas</li> <li>- Stockpile Areas</li> <li>- Waste Disposal Facilities</li> <li>- Hazardous Substances Storage Area</li> <li>- Etc.</li> <li>• Designate the boundaries of the active construction start-up site, by erecting fencing / danger tape (where applicable)</li> <li>• Fence off operational footprint area (if possible) to ensure all operational activities are contained within the designate area.</li> <li>• All construction and operational activities must be contained within the demarcated servitude determined in consultation with the ECO.</li> <li>• Care will be taken to prevent unnecessary damage to vegetation near to construction activities.</li> <li>• The necessary precautions with regard to road safety will be implemented for construction work within road crossings (if any).</li> <li>• Proper sanitation, water and waste facilities</li> </ul>

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
			<p>will be in place for construction workers throughout the construction phase.</p> <ul style="list-style-type: none"> <li>• Chemical toilets will be cleaned and serviced regularly and proof thereof will be available on site.</li> <li>• Potable water will be made available daily to workers on site.</li> <li>• Fire-fighting equipment will be available on site, where applicable.</li> <li>• If artefacts or graves are uncovered during construction activities, work in the immediate vicinity will be stopped until the project Archaeologist and SAHRA has been consulted.</li> <li>• Adjacent landowners will be notified of proposed blasting, 24 hours prior to blasting activities.</li> </ul>
Site access	<b>Direct impacts:</b> <ul style="list-style-type: none"> <li>• Loss of vegetation</li> <li>• Loss of animal life</li> <li>• Erosion</li> <li>• Pollution</li> <li>• Storm water contamination</li> </ul>	<b>Without Mitigation:</b> Medium Negative  <b>With Mitigation:</b> Low Negative	<ul style="list-style-type: none"> <li>• Necessary drawings for the upgrading of intersections (if any) are to be submitted to the relevant authority (SANRAL / Provincial Department of Roads / Municipality's Department of Roads) for approval, and the upgrades are to be implemented</li> <li>• The current access road should be improved, when required</li> </ul>
	<b>Indirect impacts:</b>	<b>Without Mitigation:</b>	

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	<ul style="list-style-type: none"> <li>• Loss of vegetation</li> <li>• Loss of animal life</li> <li>• Erosion</li> <li>• Surface water contamination</li> </ul>	<p>High Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	<ul style="list-style-type: none"> <li>• Proper storm water measures are to be implemented to avoid run-off of water and washing of sand / soil onto the road</li> <li>• Erosion measures will be implemented</li> <li>• Removal of vegetation will be kept to the required area</li> <li>• No animals will be hunted / captured on site (only to be undertaken by a relevant specialist)</li> </ul>
	<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>• Loss of vegetation</li> <li>• Loss of animal life</li> <li>• Erosion</li> <li>• Surface and groundwater contamination</li> </ul>	<p><b>Without Mitigation:</b> High Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	
Employee conduct on site	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>• Loss of vegetation</li> <li>• Loss of animal life</li> <li>• Erosion</li> <li>• Pollution</li> <li>• Storm water contamination</li> <li>• Occurrence of waste on site</li> <li>• Various health and safety aspects</li> </ul>	<p><b>Without Mitigation:</b> Medium Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	<ul style="list-style-type: none"> <li>• No animals may be harmed / captured / trapped and / or hunted. This must be strictly enforced.</li> <li>• Animals found at the construction site will be removed and relocated to an appropriate area, by a suitable, qualified person</li> <li>• No open fires allowed. Provision will be made that no accidental fires are started.</li> <li>• No firewood will be collected on site or in surrounding areas, without written approval from the landowner.</li> <li>• No smoking or open fires will be allowed</li> </ul>
	<p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>• Loss of vegetation</li> </ul>	<p><b>Without Mitigation:</b> High Negative</p>	

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	<ul style="list-style-type: none"> <li>• Loss of animal life</li> <li>• Erosion</li> <li>• Pollution</li> <li>• Storm water contamination</li> <li>• Occurrence of waste on site</li> <li>• Various health and safety aspects</li> <li>• Fire outbreaks</li> </ul>	<p><b>With Mitigation:</b> Low Negative</p>	<p>near storage facilities</p> <ul style="list-style-type: none"> <li>• No waste may be dumped on site</li> <li>• Employees should make use of the ablution facilities provided</li> </ul>
	<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>• Loss of vegetation</li> <li>• Loss of animal life</li> <li>• Erosion</li> <li>• Pollution</li> <li>• Storm water contamination</li> <li>• Occurrence of waste on site</li> <li>• Various health and safety aspects</li> <li>• Fire outbreaks</li> </ul>	<p><b>Without Mitigation:</b> Medium Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
Soil, erosion and vegetation management	<b>Direct impacts:</b> <ul style="list-style-type: none"> <li>• Destruction of vegetation</li> <li>• Loss of topsoil</li> <li>• Loss of vegetative species of conservational concern</li> <li>• Noise elevation due to construction activities</li> <li>• Nuisance dust generation</li> <li>• Visual impact of rock and spoil material dumps</li> </ul>	<b>Without Mitigation:</b> Medium Negative  <b>With Mitigation:</b> Low Negative	<ul style="list-style-type: none"> <li>• Construction activities will be limited to designated construction areas to prevent peripheral impacts on surrounding natural habitats. Construction vehicles will also keep to constructed roads where possible, so that natural vegetation is not destroyed unnecessarily.</li> <li>• Access roads or temporary crossings must be non-erosive, structurally stable and not induce flooding / safety hazard.</li> <li>• If any access road or temporary crossing is impaired, it will be repaired immediately to prevent any future / further damage.</li> <li>• All human movement and activities will be contained within designated construction areas in order to prevent peripheral impacts on surrounding natural habitat.</li> <li>• Erosion management is important. Rehabilitation measures must be monitored to ensure that no erosion has occurred and the disturbed areas have been adequately re-vegetated.</li> </ul>
	<b>Indirect impacts:</b> <ul style="list-style-type: none"> <li>• Erosion</li> <li>• Establishment of alien / invader vegetation species</li> <li>• Possible impact on heritage artefacts</li> <li>• Loss of fauna on site.</li> </ul>	<b>Without Mitigation:</b> Medium Negative  <b>With Mitigation:</b> Low Negative	

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>• Erosion</li> <li>• Establishment of alien vegetation species</li> </ul>	<p><b>Without Mitigation:</b> Medium Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	<ul style="list-style-type: none"> <li>• Concurrent rehabilitation of disturbed areas will be undertaken to help the recovery of the vegetation.</li> <li>• Stockpiled soil will be stockpiled in an area where it will not be disturbed by vehicles.</li> <li>• Stockpiled soil will be protected from washing away during rainstorms. For example: <ul style="list-style-type: none"> <li>- One layer of bricks or stones can be placed around the stockpiled topsoil.</li> <li>- Bricks may be placed around the stockpiles, to limit the loss thereof due to rainy events.</li> <li>- Stockpiles should not be higher than 1.5 m.</li> <li>- The gradient of stockpiles should not be greater than 1:1.5.</li> </ul> </li> <li>• Stockpiles should be located away from drainage lines, watercourses and areas of temporary flood</li> <li>• All soil excavated is to be separated into top- and subsoil. Subsoil must be used for backfilling and topsoil for landscaping and rehabilitation of disturbed areas</li> <li>• Stockpiled material will be placed on the</li> </ul>

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
			<p>cleared areas once construction is completed. Re-spreading of topsoil is preferably to be done to a maximum of 10 cm.</p> <ul style="list-style-type: none"> <li>• Fertilisers should be used where topsoil and subsoil was mixed or where the topsoil is not up to original standard</li> <li>• Indigenous tree species in the vicinity of the operational site (if any) should be marked with danger tape. Disturbance to such species should be avoided, where possible. Permit should be obtained for the removal / transplantation of these species</li> <li>• A permit for the removal of protected plant species will be obtained before the removal of these species (if any).</li> <li>• An alien control and monitoring programme will be developed starting during the construction phase and will be carried over into the operational phase.</li> <li>• Any proclaimed weed or alien species that germinates during the contract period will be cleared by hand / approved chemicals before flowering thereof.</li> <li>• Imported fill material will be monitored</li> </ul>

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
			<p>during and after construction for the presence of any alien species. Any such species will be removed immediately.</p> <ul style="list-style-type: none"> <li>• Fire fighting equipment will be available on site.</li> <li>• Species, especially grasses, trees and shrubs occurring in the region will be used to rehabilitate disturbed areas.</li> <li>• Compacted soils (such as dirt tracks not to be utilised during the operational phase) must be ripped to ensure the establishment of natural occurring vegetation.</li> <li>• Should natural re-growth not be sufficient, the area should be hydro-seeded.</li> <li>• Concurrent rehabilitation should be undertaken, where possible.</li> <li>• Vegetation clearance will be limited to the required area.</li> <li>• Speed limit will be enforced on the construction vehicles and these vehicles will only make use of designated roads / pathways.</li> <li>• Dust control measures will be implemented if nuisance dust generation occurs during the construction period.</li> </ul>



Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
			<ul style="list-style-type: none"> <li>• All archaeological findings (if any) should be recorded and reported to SAHRA. No construction activities in the area may proceed without the authorisation from SAHRA.</li> <li>• Storm water measures will be implemented in order to manage storm water and this will also prevent erosion.</li> <li>• Visual inspections for the occurrence of erosion should be undertaken on a weekly basis.</li> <li>• No animals may be captured / harmed / killed on site.</li> <li>• Any occurrences of harmed animals should be reported to the ECO and recorded as such.</li> </ul>
Minimise contamination and sterilisation of soil	<b>Direct impacts:</b> <ul style="list-style-type: none"> <li>• Slow regrowth of natural occurring vegetation during the rehabilitation phase</li> <li>• Loss of vegetation</li> </ul>	<b>Without Mitigation:</b> Medium Negative  <b>With Mitigation:</b> Low Negative	<ul style="list-style-type: none"> <li>• Use of potentially polluting and hazardous substances should be strictly controlled</li> <li>• If soil is significantly contaminated by hazardous substances, then this soil is considered as hazardous and should be disposed of according to best practices</li> <li>• Repair / maintenance will be conducted on site, and impacts like oil spills should be appropriately mitigated. Spill response</li> </ul>
	<b>Indirect impacts:</b> <ul style="list-style-type: none"> <li>• Loss of vegetation</li> <li>• Loss of animal life</li> </ul>	<b>Without Mitigation:</b> High Negative	

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	<ul style="list-style-type: none"> <li>Establishment of alien vegetation</li> <li>Erosion</li> </ul>	<p><b>With Mitigation:</b> Low Negative</p>	<p>procedures must be clearly defined and well known by all staff.</p> <ul style="list-style-type: none"> <li>All threatened or protected plant species as specified by the NEM: Biodiversity Act (2004) will be identified on site. Permits are required for the removal / transplantation of these plants.</li> </ul>
	<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>Loss of vegetation</li> <li>Loss of animal life</li> <li>Establishment of alien vegetation</li> <li>Erosion</li> </ul>	<p><b>Without Mitigation:</b> High Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	
Trenching, placing of pipeline and covering of pipeline	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>Visual impact of rock and spoil material dumps from trench excavation all along the route</li> <li>Noise elevation due to construction activities</li> <li>Nuisance dust generation</li> </ul>	<p><b>Without Mitigation:</b> Medium - High Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	<ul style="list-style-type: none"> <li>Site will be kept neat and tidy.</li> <li>Appropriate area will be identified as a stockpiling area.</li> <li>Speed limit will be enforced on the construction vehicles and these vehicles will only make use of designated roads / pathways.</li> <li>Dust control measures will be implemented if nuisance dust generation occurs during the construction period.</li> <li>Stockpiled material will be stored in such a way to limit the loss thereof. For example: <ul style="list-style-type: none"> <li>Bricks may be placed around the stockpiles, to limit the loss thereof due to rainy events.</li> <li>Stockpiles should not be higher than 1.5</li> </ul> </li> </ul>
	<p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>Erosion</li> <li>Establishment of alien / invader vegetation species</li> <li>Possible impact on</li> </ul>	<p><b>Without Mitigation:</b> Medium - High Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	heritage artefacts <ul style="list-style-type: none"> <li>• Loss of fauna on site</li> </ul>		m. <ul style="list-style-type: none"> <li>- The gradient of stockpiles should not be greater than 1:1.5.</li> <li>• Noise control measures will be implemented.</li> <li>• All employees will be provided with the correct PPE.</li> <li>• Establishment of alien / invader vegetation will be monitored and these species will be removed by hand or by an approved chemical before gestation thereof.</li> <li>• All archaeological findings (if any) should be recorded and reported to SAHRA. No construction activities in the area may proceed without the authorisation from SAHRA.</li> <li>• Storm water measures will be implemented in order to manage storm water and this will also prevent erosion.</li> <li>• Visual inspections for the occurrence of erosion should be undertaken on a weekly basis.</li> </ul>

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	<b>Cumulative impacts:</b> <ul style="list-style-type: none"> <li>• Erosion</li> <li>• Establishment of alien vegetation species</li> </ul>	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	<ul style="list-style-type: none"> <li>• No animals may be captured / harmed / killed on site.</li> <li>• Any occurrences of harmed animals should be reported to the ECO and recorded as such.</li> </ul>
Ablution Facilities	<b>Direct impacts:</b> <ul style="list-style-type: none"> <li>• Pollution of surface water runoff</li> <li>• Pollution of soil</li> </ul>	<b>Without Mitigation:</b> Medium Negative  <b>With Mitigation:</b> Low Negative	<ul style="list-style-type: none"> <li>• No open areas or the surrounding vegetation may be used as 'toilet facilities'.</li> <li>• Toilets should be available for all employees. Where waterborne sewerage is not available, the ECO must designate an area within the boundaries of the site for the erection of portable chemical toilets.</li> <li>• Toilet facilities shall occur at a minimum ration of 1 toilet per 15 employees.</li> <li>• Toilets shall be maintained in a hygienic state and serviced when required.</li> <li>• Temporary toilets should be serviced regularly and the contents be removed to a licensed disposal facility.</li> </ul>
	<b>Indirect impacts:</b> <ul style="list-style-type: none"> <li>• Pollution of surface water runoff</li> <li>• Pollution of soil</li> <li>• Pollution of groundwater</li> <li>• Odour</li> <li>• Unnatural enrichment of soil</li> </ul>	<b>Without Mitigation:</b> Medium Negative  <b>With Mitigation:</b> Low Negative	
	<b>Cumulative impacts:</b> <ul style="list-style-type: none"> <li>• Pollution of surface water runoff</li> </ul>	<b>Without Mitigation:</b> High Negative	

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	<ul style="list-style-type: none"> <li>• Pollution of soil</li> <li>• Pollution of groundwater</li> <li>• Odour</li> <li>• Unnatural enrichment of soil</li> </ul>	<b>With Mitigation:</b> Low Negative	
Safeguard water resources	<b>Direct impacts:</b> <ul style="list-style-type: none"> <li>• Contamination of surface water resources</li> </ul>	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	<ul style="list-style-type: none"> <li>• No activities will be undertaken within 32 m of a watercourse / within the 1:100 year floodline / 500m of a wetland, without the necessary authorisations (for example from DESTEA and DWS).</li> <li>• Caution will be taken to ensure that construction materials are not dumped or stored within storm water management systems.</li> <li>• Construction activities in the storm water infrastructure will be limited through proper demarcation and appropriate environmental awareness training.</li> <li>• The Contractor is responsible to inform all staff of the need to be vigilant against any practice that will have a harmful effect on waterways.</li> <li>• Infilling, excavation, drainage and hardening of surfaces will not occur</li> </ul>
	<b>Indirect impacts:</b> <ul style="list-style-type: none"> <li>• Erosion</li> <li>• Change in flow of water course</li> <li>• Pollution (surface water, groundwater and soil)</li> </ul>	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	
	<b>Cumulative impacts:</b> <ul style="list-style-type: none"> <li>• Erosion</li> <li>• Change in flow of water course</li> <li>• Pollution (surface water, groundwater and soil)</li> </ul>	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
			<p>unnecessarily in storm water infrastructure.</p> <ul style="list-style-type: none"> <li>• Emergency plans will be in place in case of fuel spillages (to limit the occurrence of soil as well as groundwater pollution).</li> <li>• A monitoring system should be implemented to determine the occurrence (if any) of any fuel / oil spillages during the construction or operational phase.</li> <li>• A monitoring system should be implemented to determine the occurrence (if any) of any fuel / oil spillages during the construction phase.</li> <li>• The necessary mitigation measures should be implemented immediately, should any leakages / spills be detected.</li> <li>• Weather forecasts from the South African Weather Bureau of up to three days in advance will be monitored on a daily basis to avoid exposing soil or construction works or materials during a storm event and appropriate action will be taken in advance to protect construction works should a storm event be forecasted.</li> <li>• All no-go areas will be demarcated under guidance of the Environmental Control</li> </ul>

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
			Officer (ECO). <ul style="list-style-type: none"> <li>• The design of drainage systems will ensure that there is no contamination or eutrophication. Drainage systems will be maintained regularly in order to minimize the runoff of harmful chemical substances into the waterway(s).</li> <li>• It will be ensured that the construction activities have minimal effects on the flow of water through the storm water infrastructure.</li> <li>• No erosion or siltation may occur due to any construction or operational activities.</li> <li>• Construction and operational activities should take the wetland boundaries and associated buffer zones into consideration.</li> <li>• Occurrence of erosion will be monitored. Repairs will be undertaken as soon as possible.</li> </ul>
Workings within / near to watercourses	<b>Direct impacts:</b> <ul style="list-style-type: none"> <li>• Temporary blockage of water</li> <li>• Loss of vegetation</li> <li>• Loss of aquatic animal life</li> </ul>	<b>Without Mitigation:</b> Medium - High Negative  <b>With Mitigation:</b> Low Negative	<ul style="list-style-type: none"> <li>• Storm water measures will be implemented in order to manage storm water and this will also prevent erosion.</li> <li>• Construction activities in waterways should be undertaken in such a manner that no containment of water is required, where</li> </ul>

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	<ul style="list-style-type: none"> <li>• Erosion</li> <li>• Scouring</li> </ul> <p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>• Ponding of water during construction at waterways (due to blockage of waterways).</li> <li>• Surface and groundwater pollution due to spillage of potential hazardous substances such as hydraulic material and untreated sewage explained above.</li> <li>• Impact on waterways (including the natural habitat of the area), soil disturbances and including pollution.</li> <li>• Possible change of flow of water in waterways during the construction activities near / through</li> </ul>	<p><b>Without Mitigation:</b> Medium - High Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	<p>possible. 2/3 of the waterways may be diverted at a time, where required.</p> <ul style="list-style-type: none"> <li>• The necessary authorisations should be obtained from DWS, should the containment of water be required.</li> <li>• All scour outlets will be provided with stone pitched or gabion mattress lined channels.</li> <li>• Visual inspections for the occurrence of erosion should be undertaken on a weekly basis.</li> </ul>



Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	the waterways. • Erosion • Scouring • Loss of biodiversity		
	<b>Cumulative impacts:</b> • Erosion • Loss of vegetation • Scouring • Possible change of flow of water in waterways • Loss of biodiversity	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	
Handling of waste / Waste Management (Note that waste refers to all construction debris and domestic waste generated due to construction activities.)	<b>Direct impacts:</b> • Spillage of material to be utilised during the construction phase as well as untreated sewage to the surrounding environment • Dumping of construction rubble and general waste on site	<b>Without Mitigation:</b> Medium - High Negative  <b>With Mitigation:</b> Low Negative	<ul style="list-style-type: none"> <li>• The contractor is responsible for the removal of construction waste.</li> <li>• Suitable containers (weather and vermin proof) will be placed on site to collect all solid waste. These will be emptied regularly.</li> <li>• No littering is permitted. During the construction and operational phase the site will be maintained in a neat and tidy condition.</li> <li>• All solid waste produced will be disposed of at an authorized landfill site. Recyclable waste may also be sold to recycling contractors.</li> </ul>
	<b>Indirect impacts:</b> • Surface and groundwater pollution	<b>Without Mitigation:</b> Medium -High Negative	

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	<p>due to spillage of potential hazardous substances such as untreated sewage from the temporary toilets and hydraulic material.</p> <ul style="list-style-type: none"> <li>• Impact on waterways (including the natural habitat of the area), including pollution.</li> <li>• Pollution of soil</li> </ul>	<p><b>With Mitigation:</b> Low Negative</p>	<ul style="list-style-type: none"> <li>• No dumping, burning or burying of waste will be undertaken on site.</li> <li>• All hazardous waste will be disposed of at an authorized hazardous landfill site.</li> <li>• Recyclable hazardous waste will be re-used or sold to recycling contractors, where possible</li> <li>• A waste management plan will be compiled and designed to ensure that adequate waste management activities are undertaken.</li> </ul>
	<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>• Pollution of downstream watercourses</li> <li>• Pollution of soil</li> <li>• Pollution of groundwater</li> <li>• Air pollution</li> </ul>	<p><b>Without Mitigation:</b> Medium - High Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	<ul style="list-style-type: none"> <li>• Areas used for waste storage and loading of materials should be lined and bund walls have to be erected to contain any spills that might occur.</li> <li>• Waybills providing evidence of correct disposal procedure must be provided for the ECO's inspection.</li> <li>• Waste classification should be undertaken.</li> <li>• Visual inspections for the occurrence of pollution should be undertaken daily.</li> <li>• Spills should be cleaned up immediately according to best practices</li> <li>• DWS should be notified of any spillage / pollution of water sources (groundwater</li> </ul>

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
			<p>and / or surface water) within 24 hours of occurrence</p> <ul style="list-style-type: none"> <li>Record should be kept on site to indicate date of visual inspection, any spillages observed, and manner in which spill was treated.</li> </ul>
Health, safety and security	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>Road safety at road crossings</li> <li>Injuries on site</li> <li>Health issues on site (for example, due to pollution)</li> <li>Unauthorised entry</li> </ul>	<p><b>Without Mitigation:</b> Medium Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	<ul style="list-style-type: none"> <li>Site should be fenced / marked with danger tape, where possible.</li> <li>The contractors will comply with the Occupational Health and Safety Act, National Building Regulations and any other national, regional or local regulations with regard to safety on site.</li> <li>Construction contracts will include safety and security measures for staff.</li> <li>Precautions to ensure that construction staff and sites are visible and proper PPE will be provided to all employees.</li> <li>Suitable warning and information signage should be available at the storage facilities. In addition, telephone numbers of emergency services (including local firefighting services) must be posted conspicuously on site.</li> <li>Employees should be made aware of the</li> </ul>
	<p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>Loss of vegetation and animal life due to possible fire outbreaks</li> <li>Road safety issues at road crossings</li> <li>Injuries on site</li> <li>Health issues on site (for example, due to pollution)</li> <li>Unauthorised entry</li> </ul>	<p><b>Without Mitigation:</b> Medium Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>• Loss of vegetation and animal life due to possible fire outbreaks</li> <li>• Road safety issues at road crossings</li> <li>• Injuries on site</li> <li>• Health issues on site (for example, due to pollution)</li> <li>• Unauthorised entry</li> </ul>	<p><b>Without Mitigation:</b> Medium Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	<p>health risks associated with any hazardous substances / dangerous goods used or stored on site. This includes soil that was contaminated with oil or diesel, etc.</p> <ul style="list-style-type: none"> <li>• Employees should receive relevant safety training in handling of hazardous substances / dangerous goods associated with the proposed project.</li> <li>• Construction work within road reserves will accommodate road users as far as possible. This includes the following: <ul style="list-style-type: none"> <li>- Roads will be crossed in half widths at a time to minimise the impact on vehicular traffic, where possible.</li> <li>- Construction along and across existing roads will be executed in such a manner that both pedestrian and vehicular traffic is accommodated at all times.</li> <li>- The contractor will be required to maintain adequate access to all public and private property at all times.</li> <li>- Contractor will supply, erect and maintain road signs for all work areas conforming to the prescribed layout and requirement of the South African Road Traffic Signs</li> </ul> </li> </ul>

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
			<p>Manual and other relevant notices.</p> <ul style="list-style-type: none"> <li>• Fire extinguishers will be available on site and in the construction camp (if any).</li> <li>• The contractor will be required to maintain adequate access to all public and private property at all times.</li> <li>• Speed limits of 20km/h will be enforced.</li> <li>• All relevant IAPs will be notified prior to any blasting activities</li> <li>• All relevant IAPs will be notified 24 hours prior to any known potential risks associated with the site and the activities to be undertaken on site. (For example, possible downstream flooding as a result of upstream diversion that are being removed.)</li> <li>• The necessary precautions with regard to road safety will be implemented for construction work within road crossings.</li> <li>• All injuries should be recorded.</li> </ul>
Heritage	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>• Harm to unknown heritage resources</li> </ul>	<p><b>Without Mitigation:</b> High Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	<ul style="list-style-type: none"> <li>• In the case of the discovery of any heritage, archaeological or palaeontological significance, the work in the area will be stopped and reported to the archaeologist and SAHRA. Any</li> </ul>

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	<b>Indirect impacts:</b> <ul style="list-style-type: none"> <li>• Loss of heritage resources</li> </ul>	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	<p>construction activities in the nearby vicinity may only commence after approval is obtained from SAHRA as well as the ECO.</p> <ul style="list-style-type: none"> <li>• Known heritage resources (if any) must be avoided as far as possible.</li> <li>• Employees should be encouraged and informed of the need to be on the look-out for potential fossils / buried archaeological material.</li> <li>• In the case of the discovery of any stone tools or other archaeological or palaeontological material, the work in the immediate vicinity should temporarily cease and reported to the archaeologist and SAHRA. Should any human remains be exposed, the archaeologist as well as the local SAPS should be notified.</li> <li>• If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Tel: 021 462 5402) must be</li> </ul>
	<b>Cumulative impacts:</b> <ul style="list-style-type: none"> <li>• Loss of heritage resources</li> </ul>	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
			<p>alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Tel: 012 320 8490), must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA.</p> <ul style="list-style-type: none"> <li>• Appropriate measures should be undertaken by the ECO until the archaeologist / SAPS visits the site. This should include the following: <ul style="list-style-type: none"> <li>• Site should be fenced with 'danger tape'</li> <li>• Position of finding should be recorded</li> <li>• Depth of finding should be recorded</li> <li>• Digital image of the finding should be taken</li> </ul> </li> <li>• No information on the findings may be made public without the consent of the archaeologist / SAPS.</li> </ul>

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
			<ul style="list-style-type: none"> <li>Construction activities in the area may only continue after approval from the archaeologist and SAHRA.</li> </ul>
Noise and dust control	<b>Direct impacts:</b> <ul style="list-style-type: none"> <li>Elevation of noise levels</li> <li>Generation of nuisance dust</li> </ul>	<b>Without Mitigation:</b> Medium Negative  <b>With Mitigation:</b> Low Negative	<ul style="list-style-type: none"> <li>Construction activities will be limited to normal daytime hours, where possible</li> <li>Noise levels will be kept as low as possible during the construction phase in order not to disturb adjacent landowners</li> <li>Proper mitigation measures will be implemented to limit noise (e.g. the installation of silencers, where required).</li> <li>Proper mitigation measures will be implemented to limit the formation of dust (e.g. wetting of construction area, when required).</li> <li>The speed of the construction vehicles will be limited to avoid dangerous conditions, the formation of dust and the excessive deterioration of roads being used.</li> </ul>
	<b>Indirect impacts:</b> <ul style="list-style-type: none"> <li>Air pollution</li> <li>Increase in noise levels outside of the proposed construction site may have a negative impact on surrounding landowners / occupants</li> </ul>	<b>Without Mitigation:</b> Medium Negative  <b>With Mitigation:</b> Low Negative	
	<b>Cumulative impacts:</b> <ul style="list-style-type: none"> <li>Air pollution</li> <li>Increase in noise levels outside of the proposed construction site may have a negative impact on surrounding landowners /</li> </ul>	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	



Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	occupants		
Handling and Storage of materials	<b>Direct impacts:</b> <ul style="list-style-type: none"> <li>• Soil pollution</li> <li>• Air pollution</li> <li>• Fire outbreaks</li> <li>• Surface water pollution</li> <li>• Injuries</li> <li>• Health issues</li> </ul>	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	<ul style="list-style-type: none"> <li>• All chemicals used during the development, including fuel, will be stored in a proper storeroom or protected area to prevent pollution.</li> <li>• Vehicles will be serviced at designated areas. No oil, diesel or other chemicals may be spilled or discharged anywhere.</li> <li>• Where applicable, the contractors will ensure that all relevant national, regional and local legislation regarding storage, transport, use and disposal of petroleum, chemical, harmful or hazardous substances and materials are adhered to, where necessary.</li> <li>• Cement and concrete mixing, if applicable, will only take place within the construction site. No concrete will be mixed directly on the ground.</li> <li>• All environmental problems occurring on the site such as chemical spillage, wasteful water disposal, etc. will be reported to the ECO. The ECO should implement best practices to rectify the impacts thereof on the environment.</li> </ul>
	<b>Indirect impacts:</b> <ul style="list-style-type: none"> <li>• Loss of vegetation and animal life due to fire outbreaks</li> <li>• Soil pollution</li> <li>• Air pollution</li> <li>• Surface and groundwater pollution</li> <li>• Injuries</li> <li>• Health issues</li> </ul>	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	
	<b>Cumulative impacts:</b> <ul style="list-style-type: none"> <li>• Loss of vegetation and animal life due to fire outbreaks</li> <li>• Soil pollution</li> <li>• Air pollution</li> <li>• Surface and</li> </ul>	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	groundwater pollution • Injuries • Health issues		<ul style="list-style-type: none"> <li>• Spill response equipment must be available during the handling and loading of hazardous waste (if any).</li> <li>• Hazardous substances such as above ground fuel tanks are to be stored in bunded areas.</li> <li>• Bund walls will have a capacity of at least 110% of the total capacity of the stored volume.</li> <li>• No oil, diesel or other chemicals may be spilled or discharged anywhere and contact with bare soil should be avoided at all cost.</li> <li>• Drip trays will be used during the servicing of vehicles as well as the transfer of chemicals / substances from transportation vehicles.</li> <li>• A monitoring system should be implemented to determine the occurrence (if any) of any fuel / oil spillages / untreated sewer.</li> <li>• The necessary mitigation measures should be implemented immediately, should any leakages / spills be detected.</li> <li>• Material stockpiles, such as bricks and</li> </ul>

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
			<p>pipes, must be stable and well secured to avoid collapse and possible injury</p> <ul style="list-style-type: none"> <li>• Material and Safety Data Sheets (MSDSs) should be readily available on site for all hazardous materials. MSDSs should additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases or escapes.</li> <li>• Storage areas should be kept clean and free from any accumulation of combustible matter (such as paper) and any possible source of ignition should be removed.</li> </ul>
Hazardous waste management	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>• Soil pollution</li> <li>• Air pollution</li> <li>• Fire outbreaks</li> <li>• Surface water pollution</li> <li>• Injuries</li> <li>• Health issues</li> </ul>		<ul style="list-style-type: none"> <li>• Hazardous wastes must be separated from general wastes, stored within secondary containment in appropriate containers.</li> <li>• Proper storage facilities for the storage of hazardous / dangerous goods must be provided to prevent the migration of spillage into the soil and or groundwater.</li> <li>• Certificates / waybills of hazardous waste disposals are to be available on request as well as auditing purposes. This includes the removal of soil contaminated with hydrocarbons.</li> </ul>
	<p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>• Loss of vegetation and animal life due to fire outbreaks</li> <li>• Soil pollution</li> </ul>	<p><b>Without Mitigation:</b> High Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	<ul style="list-style-type: none"> <li>• Air pollution</li> <li>• Surface and groundwater pollution</li> <li>• Injuries</li> <li>• Health issues</li> </ul>		<ul style="list-style-type: none"> <li>• Storage of hazardous substances and refuelling areas are to be bunded with an impermeable liner to protect groundwater quality and must comply with the relevant SANS codes.</li> </ul>
	<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>• Loss of vegetation and animal life due to fire outbreaks</li> <li>• Soil pollution</li> <li>• Air pollution</li> <li>• Surface and groundwater pollution</li> <li>• Injuries</li> <li>• Health issues</li> </ul>	<p><b>Without Mitigation:</b> High Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	<ul style="list-style-type: none"> <li>• Areas used for the storage of hazardous materials are to be clearly indicated as such.</li> </ul>
Hazardous and Flammable materials: Delivery	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>• Soil pollution</li> <li>• Air pollution</li> <li>• Fire outbreaks</li> <li>• Surface water pollution</li> <li>• Injuries</li> <li>• Health issues</li> </ul>	<p><b>Without Mitigation:</b> High Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	<ul style="list-style-type: none"> <li>• All deliveries (especially of hazardous nature) must be supervised.</li> <li>• Subcontractors and delivery companies should be informed of the delivery procedures and made aware of restrictions as to where materials may be stored.</li> <li>• Loads must be secured to prevent spillage during transportation thereof.</li> <li>• Hazardous substances are to be transported in sealed drums or bags</li> </ul>
	<p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>• Loss of vegetation and animal life due to fire</li> </ul>	<p><b>Without Mitigation:</b> High Negative</p>	

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	outbreaks <ul style="list-style-type: none"> <li>• Soil pollution</li> <li>• Air pollution</li> <li>• Surface and groundwater pollution</li> <li>• Injuries</li> <li>• Health issues</li> </ul>	<b>With Mitigation:</b> Low Negative	
	<b>Cumulative impacts:</b> <ul style="list-style-type: none"> <li>• Loss of vegetation and animal life due to fire outbreaks</li> <li>• Soil pollution</li> <li>• Air pollution</li> <li>• Surface and groundwater pollution</li> <li>• Injuries</li> <li>• Health issues</li> </ul>	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	
Hazardous and Flammable materials: Cement and / or concrete mixing	<b>Direct impacts:</b> <ul style="list-style-type: none"> <li>• Soil pollution</li> <li>• Air pollution</li> <li>• Fire outbreaks</li> <li>• Surface water pollution</li> <li>• Injuries</li> <li>• Health issues</li> </ul>	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	<ul style="list-style-type: none"> <li>• Limit cement and concrete mixing to single sites, where possible.</li> <li>• No mixing allowed directly onto the ground.</li> <li>• All visible remains of excess material will be treated as hazardous waste.</li> <li>• Solid concrete waste may be treated as inert construction rubble. However, wet</li> </ul>
	<b>Indirect impacts:</b>	<b>Without Mitigation:</b>	

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	<ul style="list-style-type: none"> <li>• Loss of vegetation and animal life due to fire outbreaks</li> <li>• Soil pollution</li> <li>• Air pollution</li> <li>• Surface and groundwater pollution</li> <li>• Injuries</li> <li>• Health issues</li> </ul>	<p>High Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	<p>cement and liquid slurry and cement powder must be treated as hazardous waste</p>
	<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>• Loss of vegetation and animal life due to fire outbreaks</li> <li>• Soil pollution</li> <li>• Air pollution</li> <li>• Surface and groundwater pollution</li> <li>• Injuries</li> <li>• Health issues</li> </ul>	<p><b>Without Mitigation:</b> High Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	
Hazardous and Flammable materials: Gas Storage	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>• Air pollution</li> <li>• Fire outbreaks</li> <li>• Injuries</li> <li>• Health issues</li> </ul>	<p><b>Without Mitigation:</b> High Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	<ul style="list-style-type: none"> <li>• All combustible materials are to be store at least 3 m from any gas storage areas. In case of any flammable or any other gas storage areas, open flames, welding and cutting operations, smoking, etc. shall be prohibited in or near the storage area.</li> </ul>
	<p><b>Indirect impacts:</b></p>	<p><b>Without Mitigation:</b></p>	

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	<ul style="list-style-type: none"> <li>• Air pollution</li> <li>• Fire outbreaks</li> <li>• Injuries</li> <li>• Health issues</li> </ul>	<p>High Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	<ul style="list-style-type: none"> <li>• No gas will be delivered until the site is registered with local Fire Safety.</li> <li>• Cylinders should always be stored in a well-ventilated area away from spark, flames or any source of heat or ignition.</li> <li>• Cylinders should always be handled, stored, used and transported in an upright position. It should not be dropped, dragged or rolled on their sides or allowed to skid. Cylinders that are too large to be carried shall be tilted and rolled on the rims of their foot rings or bases.</li> <li>• Valves should be kept properly closed.</li> </ul>
	<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>• Air pollution</li> <li>• Fire outbreaks</li> <li>• Injuries</li> <li>• Health issues</li> </ul>	<p><b>Without Mitigation:</b> High Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	
Hazardous and Flammable materials: Chemicals, Grease and Oil Storage	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>• Soil pollution</li> <li>• Fire outbreaks</li> <li>• Surface water pollution</li> <li>• Injuries</li> <li>• Health issues</li> </ul>	<p><b>Without Mitigation:</b> High Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	<ul style="list-style-type: none"> <li>• Storage areas must be bunded and hard surfaced in order to protect groundwater quality.</li> <li>• Compliance with SANS codes and hazardous substances bylaws should be adhered to.</li> <li>• All lids must be properly sealed / closed to prevent Volatile Organic Compounds (VOCs) and other potentially harmful gaseous compounds from escaping.</li> </ul>
	<p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>• Loss of vegetation and animal life due to fire outbreaks</li> <li>• Soil pollution</li> <li>• Surface and</li> </ul>	<p><b>Without Mitigation:</b> High Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	

Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	groundwater pollution • Injuries • Health issues <b>Cumulative impacts:</b> • Loss of vegetation and animal life due to fire outbreaks • Soil pollution • Surface and groundwater pollution • Injuries • Health issues	 <b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	
Hazardous and Flammable materials: Hydrocarbon spillages	<b>Direct impacts:</b> • Fire outbreaks • Surface water pollution • Injuries • Health issues	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	<ul style="list-style-type: none"> <li>• Spill kits are to be made permanently available at areas which have the potential to be subjected to spillage of hazardous substances and dangerous goods.</li> <li>• Remediation of spillages must be conducted immediately and closed out within 24 hours.</li> <li>• No waste water or waste will be disposed of into the surrounding environment at any time. Water collected in bunded areas must be collected in containers and disposed of as hazardous waste.</li> </ul>
	<b>Indirect impacts:</b> • Loss of vegetation and animal life due to fire outbreaks • Soil pollution • Surface and groundwater pollution • Injuries	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> Low Negative	



Construction phase			
Activity	Impact summary	Significance	Proposed mitigation
	<ul style="list-style-type: none"> <li>• Health issues</li> </ul> <p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>• Loss of vegetation and animal life due to fire outbreaks</li> <li>• Soil pollution</li> <li>• Surface and groundwater pollution</li> <li>• Injuries</li> <li>• Health issues</li> </ul>	<p><b>Without Mitigation:</b> High Negative</p> <p><b>With Mitigation:</b> Low Negative</p>	<ul style="list-style-type: none"> <li>• Machinery will be kept maintained in line with manufactures specifications to minimise the risk of hydrocarbon spillages.</li> <li>• An incident reporting system will be implemented in order to ensure incidents, where spillages has occurred, are closed out and appropriate measures are taken to prevent further incidents.</li> <li>• Incidents must be reported to DWS within 24 hours.</li> <li>• Contaminated soil must be disposed of in a hazardous materials skip and removed to a licensed hazardous landfill facility by a licensed contractor.</li> </ul>

Operational phase			
Activity	Impact summary	Significance	Proposed mitigation
This phase consists of the use of the proposed pipeline. Maintenance and repair will be undertaken on the infrastructure when necessary.	<b>Direct impacts:</b> <ul style="list-style-type: none"> <li>Deterioration of the infrastructure in the long term.</li> </ul>	<b>Without Mitigation:</b> Medium – Low Negative  <b>With Mitigation:</b> Low Negative	<ul style="list-style-type: none"> <li>Regular inspections of the pipeline are to be undertaken to identify leakages. These will be attended to immediately.</li> <li>An action plan will be available and implemented immediately, in case pollution of soil / groundwater occurs to ensure that it is rectified as soon as possible.</li> <li>Maintenance and repair will be undertaken on the infrastructure when necessary.</li> <li>Soil erosion occurrences will be attended to immediately.</li> <li>Measures will be implemented to minimise the loss of water at any section.</li> <li>Establishment of alien vegetation will be monitored and alien species will be removed by hand or by an approved chemical before gestation thereof.</li> <li>Water to be transported in the pipeline should adhere to the DWS standards.</li> <li>An emergency plan should be developed in case the water does not conform to the DWS standards.</li> <li>Visual inspections should be undertaken at least every 6 months to investigate the</li> </ul>
	<b>Indirect impacts:</b> <ul style="list-style-type: none"> <li>Establishment of alien / invader species due to previous disturbance will also be associated with this phase.</li> <li>Increase in noise levels at the abstraction point, when operational.</li> <li>Erosion</li> <li>Possible change in the morphology of the watercourses due to erosion of the banks.</li> </ul>	<b>Without Mitigation:</b> Medium – Low Negative  <b>With Mitigation:</b> Low Negative	
	<b>Cumulative impacts:</b> <ul style="list-style-type: none"> <li>Establishment of alien / invader species due to previous disturbance</li> </ul>	<b>Without Mitigation:</b> Medium – Low Negative  <b>With Mitigation:</b>	

Operational phase			
Activity	Impact summary	Significance	Proposed mitigation
	<p>will also be associated with this phase.</p> <ul style="list-style-type: none"><li>• Increase in noise levels at the abstraction point, when operational.</li><li>• Erosion</li><li>• Possible change in the morphology of the watercourses due to erosion of the banks</li></ul>	Low Negative	<p>occurrence of sedimentation and erosion.</p> <ul style="list-style-type: none"><li>• Proper erosion mitigation measures should be implemented.</li><li>• Stabilise the banks of the watercourses, where necessary.</li></ul>

Decommissioning phase			
Activity	Impact summary	Significance	Proposed mitigation
<p>It is not anticipated that the proposed project will cease in the nearby future. However, if decommissioning is decided upon, a rehabilitation plan will be developed and submitted for approval. The end-use of the area will be kept in mind during the compilation of the rehabilitation plan.</p> <p>Activities associated with the decommissioning phase will be limited to the rehabilitation of areas disturbed during the construction phase. All disturbed areas will be</p>	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>• Rehabilitation of disturbed area</li> <li>• Re-vegetation</li> <li>• Limit occurrence of erosion</li> <li>• Proper stormwater control</li> <li>• No ponding on site</li> <li>• Limit visual impact</li> </ul>	<p><b>Without Mitigation:</b> Medium Positive</p> <p><b>With Mitigation:</b> High Positive</p>	<ul style="list-style-type: none"> <li>• Temporary structures and office sites (if any) will be dismantled and removed after completion of the construction phase of the project.</li> <li>• All waste, equipment, materials, etc. used during construction will be cleared from the site. The contractors will ensure that the site is cleared and rehabilitated to the satisfaction of the ECO.</li> <li>• An alien plant control and monitoring programme will be implemented.</li> <li>• The establishment of natural occurring vegetation will be encouraged at disturbed areas.</li> <li>• Re-vegetation of disturbed areas will be undertaken with site indigenous species.</li> <li>• Hydro-seeding will be implemented if the establishment of natural occurring vegetation does not occur within reasonable time.</li> <li>• After completion of the construction phase, a waterway monitoring program will be initiated that ensure that all are adequately rehabilitated.</li> <li>• Temporary concrete surfaces (if any) will be</li> </ul>
	<p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>• Rehabilitation of disturbed area</li> </ul>	<p><b>Without Mitigation:</b> Medium Positive</p> <p><b>With Mitigation:</b> High Positive</p>	
	<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>• Rehabilitation of disturbed area</li> </ul>	<p><b>Without Mitigation:</b> Medium Positive</p> <p><b>With Mitigation:</b> High Positive</p>	

Decommissioning phase			
Activity	Impact summary	Significance	Proposed mitigation
<p>rehabilitated according to best practices.</p> <p>A rehabilitation plan will be developed, if it is decided to remove the proposed pipeline and associated infrastructure before the cessation of the operation aspects of the proposed project. The rehabilitation plan will include management and mitigation measures to be implemented during the decommissioning of the project</p>			<p>removed and compacted areas ripped.</p> <ul style="list-style-type: none"> <li>Establishment of extensive alien species will be monitored.</li> </ul>

No-go Option			
Activity	Impact summary	Significance	Proposed mitigation
Keeping the status quo - Not construct the raw water pipeline.	<b>Direct impacts:</b> <ul style="list-style-type: none"> <li>No direct environmental impacts.</li> </ul>	<b>Without Mitigation:</b> N/A  <b>With Mitigation:</b> N/A	<ul style="list-style-type: none"> <li>The municipality will have to use trucks to transport potable water from adjacent towns. However, this option will largely depend on the availability of employees and suitable trucks. In addition, the adjacent towns do not have enough potable water to provide Senekal with their required volumes of water on a daily basis. Therefore, this option is not seen as a feasible option.</li> </ul>
	<b>Indirect impacts:</b> <ul style="list-style-type: none"> <li>The applicant will not be able to provide Senekal with sufficient potable water</li> </ul>	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> High Negative	
	<b>Cumulative impacts:</b> <ul style="list-style-type: none"> <li>The establishment of natural occurring vegetation will be encouraged at disturbed areas.</li> <li>This will lead to negative economic and environmental impacts</li> </ul>	<b>Without Mitigation:</b> High Negative  <b>With Mitigation:</b> High Negative	

A complete impact assessment in terms of Regulation 19(3) of GN 326 must be included as Appendix F.

## 2. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Environmental impact statement for the proposed construction of a raw water pipeline			
Alternative 1 <sup>Preferred</sup>			
Nr	Impact	Without Mitigation	With Mitigation
1	Impacts on vegetation and listed or protected plant species resulting from the construction phase	Medium Negative	Low Negative
2	Impacts on animal species resulting from construction activities	Medium-Low Negative	Low Negative
3	Erosion	High Negative	Low Negative
4	Pollution	High Negative	Low Negative
5	Health and Safety	Medium Negative	Low Negative
6	Heritage, including archaeological and paleontological	Medium-Low Negative	Low Negative
7	Visual and noise	Medium-Low Negative	Low Negative

### Alternative 1<sup>Preferred</sup>

The same as above, including:

The expected environmental impacts relating to the proposed project are mostly temporary (during the construction phase) and the mitigation measures referred to in the current document, the EMPr, Specialist Reports as well as Best Practices will ensure that the disturbance is kept to a minimum and ensure that adequate rehabilitation takes place.

### No-go alternative (compulsory)

The no-go alternative is not seen as a reasonable / feasible alternative as this will place the Local Municipality in such a position that it will not be able to provide Senekal with water, resulting in a possible water shortage and water restrictions on a regular basis.

The proposed pipeline and associated infrastructure is considered essential to enable the municipality to provide the Senekal area with adequate basic services, as the proposed project entails the transportation of raw water, to be treated at the Sekenal WTW.

As the project is described as a basic service, the lack thereof will lead to major social and economic impacts that will indirectly cause severe environmental concerns. The impacts expected during the construction phase of the proposed project can be minimised through the recommended mitigation measures and therefore the no-go alternative is not ideal.



**SECTION E. RECOMMENDATION OF PRACTITIONER**

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?

YES	
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If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment).

N/A
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If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application.

Refer to the EMPr in Appendix F for recommended mitigation measures.
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Is an EMPr attached?

YES	
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The EMPr must be attached as Appendix G.

The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as Appendix H.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in Appendix I.

Any other information relevant to this application and not previously included must be attached in Appendix J.

\_\_\_\_\_  
NAME OF EAP

\_\_\_\_\_  
SIGNATURE OF EAP

\_\_\_\_\_  
DATE

## **SECTION F: APPENDIXES**

The following appendixes must be attached:

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports (including terms of reference)

Appendix E: Public Participation

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: Specialist's declaration of interest

Appendix J: Additional Information