



BASIC ASSESSMENT REPORT

(For official use only)

File Reference Number:

Application Number:

Date Received:

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2010, 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 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.

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2. 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.
3. Where applicable **tick** the boxes that are applicable or **black out** the boxes that are not applicable in the report.
4. An incomplete report may be returned to the applicant for revision.
5. 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.
6. This report must be handed in at offices of the relevant competent authority as determined by each authority.
7. No faxed or e-mailed reports will be accepted.
8. The report must be compiled by an independent environmental assessment practitioner (EAP).
9. 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.
10. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.

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SECTION A: ACTIVITY INFORMATION

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

	NO
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If YES, please complete form for each specialist thus appointed:

Any specialist reports must be contained in Appendix D.

1. ACTIVITY DESCRIPTION

Describe the activity, which is being applied for, in detail

The proposed development aims to expand current bulk water supply infrastructure in order to address the future provision of potable water to the Seaview and Greenbushes supply areas. The Nelson Mandela Bay Municipality proposes to develop Phase 1 which entails the provision of bulk water infrastructure to 8,020 erven within Supply Zones 1, 2, 4 & 5 for the Seaview Area and Supply Zone 7 for the Greenbushes Area. The proposed bulk infrastructure for this phase is based on current water demands and is currently at planning stage.

This project, with minor changes, was authorised in August 2009, however this authorisation has lapsed and a new Basic Assessment process therefore had to be undertaken (please refer to Appendix G2 for the original authorisation).

Seaview Bulk Water Supply (Phase 1)

This supply area is currently supplied from the Seaview pump station 1.2 ML sump/ reservoir and via a number of small local schemes drawing water directly from the two adjacent Churchill pipelines. The proposed infrastructure development aims to construct those elements of the long-term plan which are required for bulk water supply to the area now and to eliminate the minor connections from the Churchill pipelines where feasible. The existing Seaview pump station complex will be expanded to accommodate the proposed bulk infrastructure. Refer to Figure 1 below or Appendix A for the Locality Plan.

The infrastructure planned for the Seaview supply area is as follows:

- The construction of a 2.5 ML clear water bulk storage reservoir (T.W.L = 79.5 Metres Above Mean Sea Level (mamsL)) at the existing lower Seaview pump station complex to serve Zone 1 & 4 (please refer to Appendix A for a map of the supply zones). It is anticipated that this reservoir will have a grassed embankment;
- The clearance of a $\pm 2,400$ m² footprint for the establishment of a 2.5 ML clear water bulk storage reservoir (T.W.L = 160 mamsL) at the proposed Upper Seaview Bulk Storage greenfield reservoir site to gravity serve Zone 2 & 5. This footprint includes space for a potential additional future reservoir. The entire footprint will be fenced. It is anticipated that this reservoir will have a grassed embankment;

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- The construction of a 3 m wide gravel access road to the proposed 2.5 ML reservoir at the Upper Seaview Bulk Storage Reservoir site. It is anticipated that the alignment of this access road will fall within pipeline servitude;
- The augmentation of the pump station at the existing Seaview pump station complex to supply the proposed 2.5 ML reservoir at the Upper Seaview reservoir site at 160 mamsl (53 L/s);
- The construction of a pumping main, 315 mm diameter class 12 and 16 uPVC pipeline (yellow line) from the Seaview pump station complex to the 2.5 ML Upper Seaview Bulk Storage Reservoir, approximately 1400 m in length within an existing 5 m wide servitude;
- The construction of a gravity main 350 mm \varnothing uPVC pipeline (pink line), from the Seaview pump station complex to the 2.5 ML Upper Seaview Bulk Storage Reservoir, approximately 1,300 m in length within an existing 5 m wide servitude,
- The construction of a pumping main 315 mm \varnothing class 16 uPVC pipeline (light blue line) at the Seaview pump station complex, approximately 250 m in length within the footprint of the complex;
- The construction of a gravity main 200 mm \varnothing class 16 uPVC pipeline (dark blue line), approximately 700 m in length from the Seaview Pump Station Complex north and parallel to the Seaview road within an existing 5 m wide road reserve. *It is noted that SRK's recommendation to move the upper part of this alignment to the southern side of the Seaview Road (to avoid the northern steep sided embankment) has been accepted by the Engineer. Design plans will be amended accordingly;*
- The construction of a 250 mm \varnothing class 16 uPVC gravity main pipeline connecting Zones 2 & 5 from the storage reservoir at the Seaview pump station complex. Two alignment options are being assessed:
 - Option 1 (preferred)(solid orange line): The alignment (approximately 2900 m in length) follows the Seaview Road up to the Churchill pipeline servitude where the alignment turns towards the west and follows the existing pipeline servitude to a point where it connects to existing infrastructure at Beachview; and
 - Option 2 (dotted orange line): This alignment (approximately 2,460 m in length) follows an existing gravel road which starts just north of the Seaview pump station complex and runs in a westerly direction. At a point where the gravel road turns north, the alignment continues further westwards through forest and then turns southwestwards to a point where it connects into existing infrastructure at Beachview;
- The construction of a 315 mm (70 m in length) class 16 uPVC gravity main pipeline (green line) connection to existing Seaview pipework, south of the Seaview pump station complex;
- Gravity connections from the service reservoirs to existing and proposed reticulation (inter-connections between proposed and new pipelines within the Seaview pump station complex, 150 mm, 200 mm, 250 mm, 300 mm and 450 mm via connections of not more than 20 m in length each); and
- Installation of metering at the Seaview pump station complex.

There is an existing power supply at Lower Seaview pump station. The NMBM Electricity Directorate will be contacted to determine whether there is spare capacity for the proposed requirements.

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Proposed abandonment and/ or demolition

- There are three brick reservoirs south of the Seaview pump station complex which supplies Seaview and Kini Bay. These reservoirs are currently in poor condition and it is proposed that these reservoirs also be abandoned and demolished once the proposed reservoir at the Seaview pump station is constructed; and
- Claredon Marine is supplied via a connection to the existing 120 kL Upper Seaview steel reservoir off the existing Seaview rising mains pumping to Greenbushes/ Chelsea. It is proposed that the reservoir will be abandoned/ demolished once the proposed Upper Seaview reservoir (160 mamsl) is constructed.

Greenbushes Bulk Water Supply (Phase 1)

The existing Greenbushes reservoir currently supplies the Chelsea Reservoir via a 525 mm gravity pipeline and a 375 mm gravity pipeline. However, the 525 mm gravity pipeline is dedicated to an emergency supply to the Chelsea Reservoir, which has a supply function outside the project area. Due to increasing developments inland and up to Cape Road it is necessary to augment the reticulation of water to this area. Therefore, it is proposed to install a 750 mm (outside diameter) gravity main steel pipeline, approximately 3,500 m in length, connecting the Greenbushes reservoir to the existing pipework near the existing Chelsea reservoir site. It is noted that this pipeline will tie into an existing 375mm diameter pipeline that connects to the Chelsea Reservoir. Refer to Figure 1 below or Appendix A for the Locality Plan.

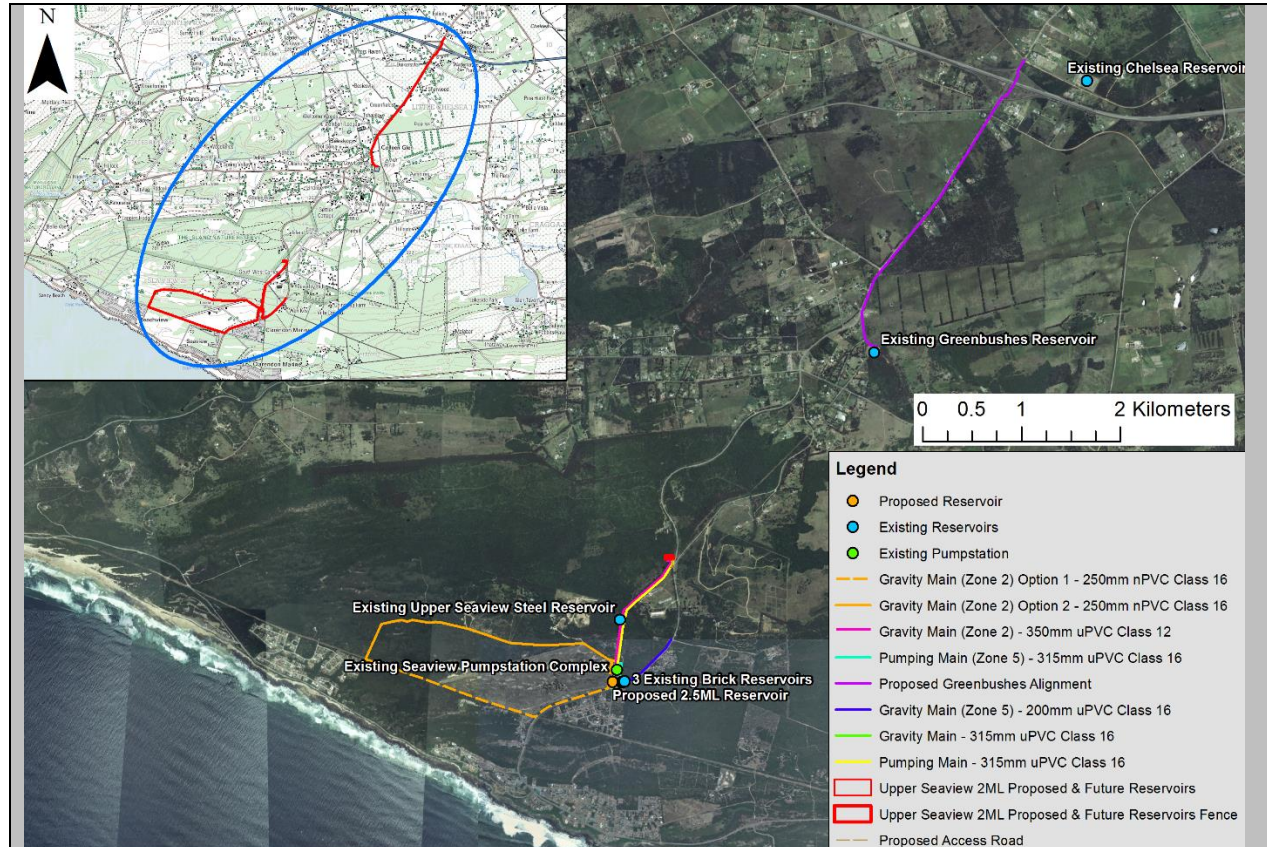


Figure 1: Site locality map

Please refer to Appendix A for detailed or larger maps.

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—

- the property on which or location where it is proposed to undertake the activity;
- the type of activity to be undertaken;
- the design or layout of the activity;
- the technology to be used in the activity;
- the operational aspects of the activity; and
- the option of not implementing the activity.

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Describe alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity 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.

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

The section below was added by SRK Consulting and is additional to the information in the original Basic Assessment Report form:

Description of Alternatives

During the planning and design stage of the project, a few alternatives were considered:

Site Alternatives:

Due to the need identified for an increase in the water availability within the relevant water supply zones, no other sites could be considered for the proposed bulk infrastructure. Alternative structure positions and pipeline alignments are discussed below under Layout Alternatives.

Activity Alternatives:

The proposed development has been planned to accommodate future growth and water requirements in the area and surrounds. The development is aimed specifically at addressing this future growth demands and therefore no activity alternatives have been considered.

Layout Alternatives:

Seaview Pump Station Complex

The existing Seaview pump station complex has adequate space to accommodate the additional pumps, reservoirs and additional infrastructure proposed. The complex surrounds have already been transformed and the transformation of undeveloped alternative areas to accommodate the proposed infrastructure would be unfavourable and therefore no alternative site locations have been considered.

Alternative Routes:

The alignments proposed for the Seaview Bulk Water Supply infrastructure has taken into account the condition of the biophysical environment and wherever possible has been aligned along existing servitudes, roads and tracks. This is of benefit as it allows easier access to the site during construction as well as for future maintenance and the environmental impact is considered to be significantly lower than if the additional infrastructure was constructed in an undisturbed area. It is therefore favourable, from an engineering perspective as well as an environmental perspective to construct the pipeline and reservoirs in the proposed positions.

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Two alternative alignments were assessed for the 250 mm \varnothing class 12 uPVC gravity main pipeline which will connect Zones 2 & 5 to the existing Seaview pump station complex, along a 3 m wide pipeline servitude. These alignment alternative options will be assessed in this report and are described as follows:

- **Option 1 (preferred)** (dotted orange line): The alignment (approximately 2,900 m in length) follows the Seaview Road up to the Churchill pipeline servitude where the alignment turns towards the west and follows the existing pipeline servitude to a point where it connects to existing infrastructure at Beachview; and
- **Option 2** (solid orange line): This alignment (approximately 2,460 m in length) follows an existing gravel road which starts just north of the Seaview pump station complex and runs in a westerly direction. At a point where the gravel road turns north, the alignment continues further westwards through forest and then turns southwestwards to a point where it connects into existing infrastructure at Beachview.

Alternative sites for reservoirs:

The site for the proposed Upper Seaview Reservoir was determined by the available land at sufficient elevation to gravity feed into the Seaview Pump Station Complex in order to minimize power consumed during pumping, and provide for future storage capacity for the water consumption in the supply area. The proposed location for the Upper Seaview Reservoir was decided due to the following reasons:

- Pressure and zone requirements; and
- Proximity to pipeline servitude so to eliminate the need to cross undeveloped land and register additional servitudes.

The project team could not identify any other position of similar elevation which could be used for the purposes of a reservoir site. It must also be noted that the proposed location (as situated within the Island Nature Reserve) is situated within an area that is currently invaded with a number of alien invasive species (namely, *Acacia cyclops*, *Eucalypt sp*, and *Melia azedarach*). The invaded areas are indicated on Map 1 of Appendix D3 as mapped by the Botanical Specialist.

Two potential alternative locations were considered for the Upper Seaview Reservoir (refer to Figure 2) during the design process, however were dismissed prior to further design work or assessment. Alternative 1 was dismissed due to insufficient elevation for efficient gravity feed and Alternative 2 was dismissed due to an unfavourable gradient.

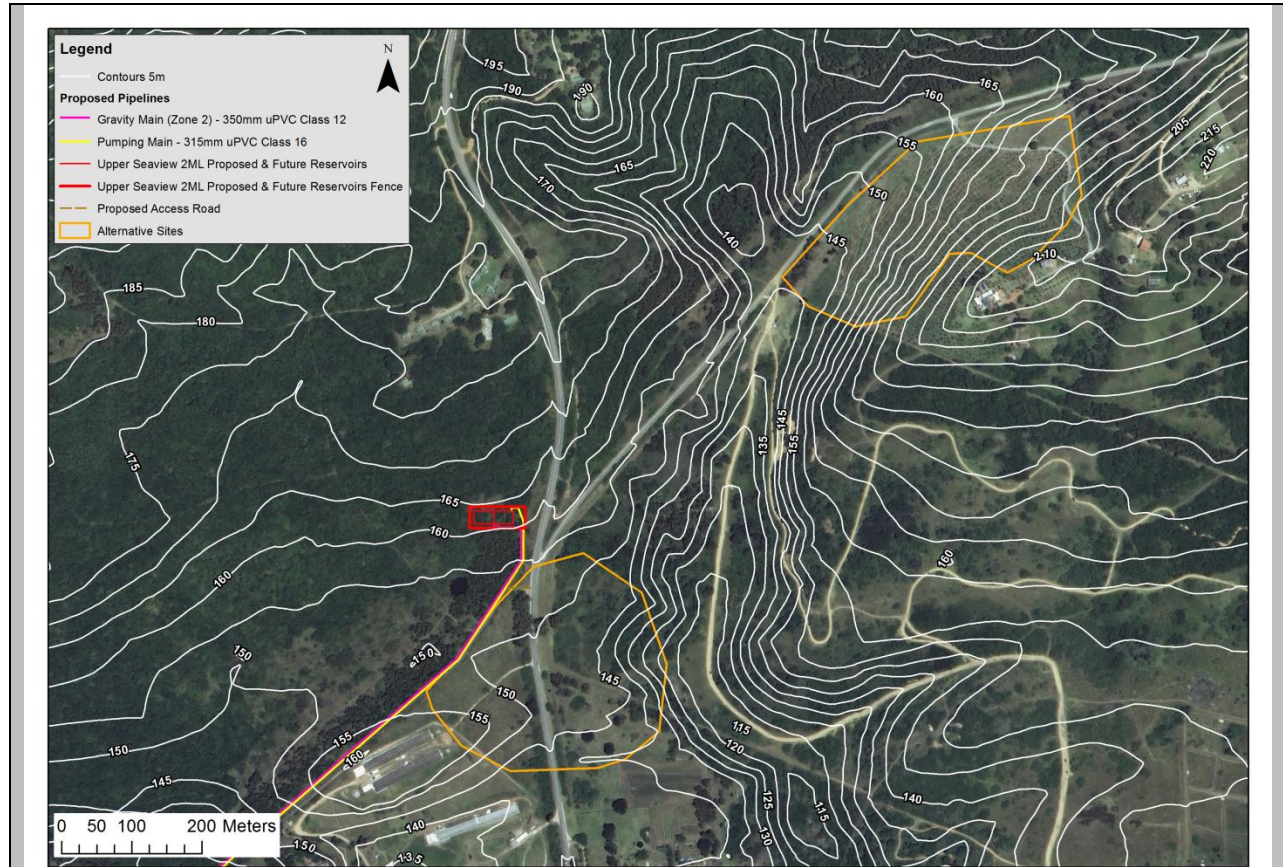


Figure 2: Upper Seaview Reservoir Location Alternatives

The proposed Lower Seaview Reservoir is located within the fenced area of the Seaview Pump Station Complex and an alternative site is therefore not needed.

Technological Alternatives:

No-go Alternative:

This alternative would result in no augmentation of the current Seaview and Greenbushes bulk water supply area. This would mean the demand for bulk potable water exceeding available supplies.

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3. ACTIVITY POSITION

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.

List alternative sites if applicable.

Alternative:	Latitude (S):		Longitude (E):	
Alternative S1¹ (Proposed Seaview Pump Station Complex 2.5 ML Reservoir)	34°	0'9.56"	25°	21'46.55"
Alternative S2 (if any)	o	'	o	'
Alternative S3 (if any)	o	'	o	'
Alternative S1 (Proposed Upper Seaview 2.5 ML Reservoir)	33°	59'28.51"	25°	22'8.36"
Alternative S2 (if any)	o	'	o	'
Alternative S3 (if any)	o	'	o	'
Alternative S1 (Existing Upper Seaview Steel Reservoir)	33°	59'49.1"	25°	21'49.3
Alternative S2 (if any)				
Alternative S3 (if any)				
Alternative S1 (Three Existing Brick Reservoirs at the Seaview Pump Station Complex)	33°	0'9.4"	25°	21'50.6"
Alternative S2 (if any)				
Alternative S3 (if any)				
In the case of linear activities:				
Alternative S1 (Access Road to Upper Seaview Reservoir)	33°	59'31.87"	25°	22'9.45"
• Starting point of the activity				
• Middle point of the activity	33°	59'30.7"	25°	22'8.15"
• End point of the activity	33°	59'29.11"	25°	22'7.9"
Alternative S2 (if any)				
Alternative S3 (if any)				
Alternative S1: (Option 1: Seaview Gravity Main – 250 mm ø uPVC Class 16 Pipeline)	Refer to Appendix G			
Alternative S2: (Option 2: Seaview Gravity Main – 250 mm ø uPVC Class 16 Pipeline)	Refer to Appendix G			
Alternative S3 (if any)				
Alternative S1: (Seaview 350 mm ø uPVC Class 12 Gravity Main Pipeline)	Refer to Appendix G			

¹ "Alternative S.." refer to site alternatives.



Alternative S2 (if any)				
Alternative S3 (if any)				
Alternative S1: (Seaview Pumping Main 315mm ø uPVC Class 16 Pipeline)	Refer to Appendix G			
Alternative S2 (if any)				
Alternative S3 (if any)				
Alternative S1: (Greenbushes 900 mm ø Steel Pipeline)	Refer to Appendix G			
Alternative S2 (if any)				
Alternative S3 (if any)				
Alternative S1: (200mm ø Class 16 uPVC pipeline from Seaview Pump Station Complex parallel to Seaview Road)	Refer to Appendix G			
Alternative S2 (if any)				
Alternative S3 (if any)				
Alternative S1: (Seaview Gravity Main 315 mm ø uPVC class 16)	Refer to Appendix G			
Alternative S2 (if any)				
Alternative S3 (if any)				

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.

Please refer to Appendix G of this report for a list of co-ordinates associated with each pipeline alignment.

4. PHYSICAL SIZE OF THE ACTIVITY

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

Alternative:	Size of the activity:
Alternative A1² (preferred activity alternative) (Proposed Seaview Pump Station Complex 2.5 ML Reservoir)	±1,803 m ²
Alternative A2 (if any)	m ²
Alternative A3 (if any)	m ²
Alternative A1(Proposed Upper Seaview 2.5 ML Reservoir – fenced area)	±2,400 m ²
Alternative A2 (if any)	m ²
Alternative A3 (if any)	m ²
Alternative A1(Existing Upper Seaview Steel Reservoir)	± 532 m ²
Alternative A2 (if any)	m ²
Alternative A3 (if any)	m ²
Alternative A1 (Three Existing Brick Reservoirs at the Seaview Pump Station)	±1,141 m ²

² "Alternative A.." refer to activity, process, technology or other alternatives.



Complex)

Alternative A2 (if any)

Alternative A3 (if any)

or, for linear activities:

Alternative:

Alternative A1 (**Access Road to Upper Seaview Reservoir**)

Alternative A2 (if any)

Alternative A3 (if any)

Alternative S1: **Option 1: Seaview Gravity Main – 250 mm ø uPVC Class 16 Pipeline**

Alternative S2: **Option 2: Seaview Gravity Main – 250 mm ø uPVC Class 16 Pipeline**

Alternative A3 (if any)

Alternative A1: **Seaview 350 mm ø uPVC Class 12 Gravity Main Pipeline**

Alternative A2 (if any)

Alternative A3 (if any)

Alternative S1: **Seaview 315 mm ø uPVC ø Class 16 Pumping Main Pipeline**

Alternative A2 (if any)

Alternative A3 (if any)

Alternative S1: **Greenbushes 900 mm ø Steel Pipeline**

Alternative A2 (if any)

Alternative A3 (if any)

Alternative S1: **(200 mm ø class 16 uPVC pipeline from Seaview Pump Station Complex parallel to Seaview Road)**

Alternative A2 (if any)

Alternative A3 (if any)

Alternative S1: **(Seaview Gravity Main 315 mm ø uPVC class 16)**

Alternative S2 (if any)

Alternative S3 (if any)

m ²
m ²

Length of the activity:

±130 m
m
m
±2,900 m
±2,460 m
m
±1,300 m
m
m
±1,400 m
m
m
3,500 m
m
m
700 m
70 m

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

Alternative:

**Size of the site/
servitude:**

Alternative A1 (**Access Road to Upper Seaview Reservoir**)

Alternative A2 (if any)

Alternative A3 (if any)

Alternative S1: **Option 1: Seaview Gravity Main – 250 mm uPVC ø Class 16 Pipeline**

Alternative S2: **Option 2: Seaview Gravity Main – 250 mm uPVC ø Class 16 Pipeline**

Alternative A3 (if any)

Alternative A1: **Seaview 350 mm uPVC ø Class 12 Gravity Main Pipeline**

Alternative A2 (if any)

Alternative A3 (if any)

3 m
m
m
5 m servitude
5 m servitude
m
5 m servitude
m
m

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Alternative S1: **Seaview 315 mm ø uPVC ø Class 16 Pumping Main Pipeline**

Alternative A2 (if any)

Alternative A3 (if any)

Alternative S1: **Greenbushes 900 mm ø Steel Pipeline**

Alternative A2 (if any)

Alternative A3 (if any)

Alternative S1: **(200mm ø class 16 uPVC pipeline from Seaview Pump Station Complex parallel to Seaview Road)**

Alternative A2 (if any)

Alternative A3 (if any)

Alternative S1: **(Seaview Gravity Main 315 mm ø uPVC class 16)**

Alternative S2 (if any)

Alternative S3 (if any)

5. SITE ACCESS

Does ready access to the site exist?

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

5 m servitude
m
m
5 m servitude
m
m
5 m servitude
5 m servitude

YES	<input type="checkbox"/>
m	<input type="checkbox"/>

Describe the type of access road planned:

Access to the proposed Seaview Pump Station Complex 2.5 ML Reservoir and proposed pipeline alignments (other than Option 2 Seaview Gravity Main and the proposed Upper Seaview 2.5 ML Reservoir) are accessible via existing roads and servitudes. Permanent access to the proposed Upper Seaview 2.5 ML Reservoir will need to be established. A three metre wide gravel access within the pipeline servitude road with the turn-off just off the Seaview Road (just before the turnoff to the Seaview Lion Park) is proposed. Access to establish and maintain the Option 2 Seaview Gravity Main line will require extensive bush clearing (discussed under the impact assessment section).

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 – **Refer to Appendix A of this Report.**

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6. SITE OR 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:

6.1 the scale of the plan which must be at least a scale of 1:500;

See Appendix A

6.2 the property boundaries and numbers of all the properties within 50 metres of the site;

See Appendix A

6.3 the current land use as well as the land use zoning of each of the properties adjoining the site or sites;

Land use information for all properties are not available.

NMBM zoning map is attached to Appendix A. Note that the zoning boundaries could be inaccurate as available data is dated 2009.

6.4 the exact position of each element of the application as well as any other structures on the site;

See Site Locality Map attached to Appendix A as well as the list of pipeline co-ordinates attached to Appendix G.

6.5 the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;

See Appendix A. Note that the map could be missing recently constructed services as available data is dated 2009.

6.6 all trees and shrubs taller than 1.8 metres;

Refer to the Vegetation Specialist Report attached to Appendix D3.

6.7 walls and fencing including details of the height and construction material;

The proposed Upper Seaview 2.5 ML Reservoir will be fenced. Details of type of fencing to be used is unknown at this stage of the project.

The servitudes for the proposed Greenbushes pipeline, the 200 m \emptyset Class 16 uPVC pipeline and the Seaview 350 mm \emptyset UPVC Class 12 Gravity Main pipeline and 315 mm \emptyset uPVC Class 18 Rising Main Pipeline run parallel to existing roads and property boundaries within the road reserve that is fenced off. None of these fences will be affected.

Proposed options 1 & 2 Seaview Gravity Main Pipelines are not within any fenced areas and no fences are proposed as part of the project scope.

6.8 servitudes indicating the purpose of the servitude;

See 6.7 above.

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The proposed Greenbushes pipeline falls adjacent to a powerline servitude. It is not anticipated that proposed works will have a negative impact on this powerline. However possible temporary power outages could be expected should heavy plant be required to work within close proximity to the powerline.

6.9 sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):

- rivers;
- the 1:100 year flood line (where available or where it is required by DWA);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or invested with alien species);

Rivers, streams, drainage lines and wetlands

See Aquatic Specialist report attached to Appendix D4 as well as maps attached to Appendix A.

1:100 year flood line

There are no permanent rivers within study area.

Ridges

No ridges occur within 100 m of the proposed works.

Cultural and historical features

Refer to Section B6 and to site abandonment locations in the site locality map attached to Appendix A.

Indigenous vegetation

Refer to Section B4 as well as vegetation map attached to Appendix A.

6.9 for gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and

Due to the linear nature and size of the project, 1 m contour intervals is not recommended. A map based on 20 m contour intervals is attached to Appendix A.

6.10 the positions from where photographs of the site were taken.

See Appendix B for a map of photo locations as well as described photographs.



7. 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 form. It must be supplemented with additional photographs of relevant features on the site, if applicable.

Photographs were taken within accessible and safe areas. Appendix B, Table 3 includes a list of the geo-referenced photographs.

8. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of 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.

Please see the NMBM Bulk Water Supply Engineers design report and pipeline drawings attached to Appendix C.

9. ACTIVITY MOTIVATION

9(a) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R75,277,000
What is the expected yearly income that will be generated by or as a result of the activity?	unknown
Will the activity contribute to service infrastructure?	Yes
Is the activity a public amenity?	No
How many new employment opportunities will be created in the development phase of the activity?	45
What is the expected value of the employment opportunities during the development phase?	unknown
What percentage of this will accrue to previously disadvantaged individuals?	25% of the contract value
How many permanent new employment opportunities will be created during the operational phase of the activity?	none

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What is the expected current value of the employment opportunities during the first 10 years?

nil
n/a

What percentage of this will accrue to previously disadvantaged individuals?

9(b) Need and desirability of the activity

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

A key prerequisite for all municipal development in Nelson Mandela Bay is sustainability and integration. This is particularly vital in respect of service delivery and infrastructure development, as the legacy of past discriminatory practices followed in the provision of services and infrastructure is still evident in many of our communities. Central to this is the establishment of sustainable and integrated human settlements is the access communities have to basic services like water provision (a basic human need) (NMBM IDP, 2006).

The Water Master Plan (2005) for the Nelson Mandela Bay Municipality identifies the need for an increase in the water availability within the Metro, particularly to allow for future expansion and development of townships. To-date the development within the Seaview and Greenbushes supply areas has been sporadic with limited formal town planning prepared. The lack of a sustainable bulk water supply has also hampered further development prospects. The proposed development aims to expand current bulk water supply infrastructure in order to address the future provision of potable water to the Seaview and Greenbushes supply areas.

The objectives of the proposed expansion of the NMBM bulk water supply infrastructure are defined by the NMBM Bulk Water Engineer Design Report as a need to:

- Eliminate individual supplies off of existing rising mains and bulk supply mains,
- Improve supply zone delineation;
- Provide adequate storage for each supply zone;
- Eliminate existing brick and steel water retaining structures; and
- The pump station should operate unmanned and is to be linked to the existing telemetry system.

The following information has been extracted from the NMBM Bulk Water Engineer Design Report (April 2016):

The Seaview supply area is currently supplied from the Seaview pump station sump and via a number of small local schemes drawing directly from the two adjacent Churchill pipelines. A number of developments are under consideration which will need an expansion of the bulk supplies. The intention is to construct those elements of the long term plan which are required now and to eliminate the minor connections from the Churchill pipelines where feasible.

The areas which would be served by the proposed scheme include:

- The existing Seaview formal township;
- The existing Clarendon Marine formal township;
- The existing Kini Bay formal township; and

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- The following proposed developments are at planning stage namely; Seaview low cost housing scheme, Blackrock Coastal Estate, Stu Davidson Development and Portion 8 Farm 28 Seaview.

Note that the EIA process for the proposed Seaview low cost housing scheme is ongoing and will require the proposed infrastructure for water supply.

The Greenbushes Supply Area comprises a pipeline to increase the gravity flow inland to cater for anticipated increased demand as well as a 15 Mℓ per day emergency supply to the Chelsea pumpstation.

The areas which would be served by the proposed scheme include:

Bridgemead, Chade Manor, Murray Park, Rowallan Park, Hunja Heath, Parsons Green, Masakhane, Greenbushes, Ericadene, Progress, Hunters Retreat, Kuyga, Denholm, Colleen Glen, Lavendula, Crockarts, Dustpan, Westlands, Butterfield and Altona.

Indicate any benefits that the activity will have for society in general:

Construction benefits include:

- During construction, 45 temporary jobs including skills development training will be provided to society.
- Provision of potable water to needy communities, i.e:
 - New scheme to accommodate the new housing development that has been earmarked for low income households; and
 - Formal water supply to the two existing informal settlement adjacent to the Seaview Pump Station Complex.

Operation benefits include:

- The water supply system will enhance Nelson Mandela Bay's water security; and
- During pipeline routine maintenance and repair work, the Municipality may potentially use the services of local contractors based on the Expanded Public Works Programme and NMBM Exempted Micro-Enterprises Supply Chain requirements.

Indicate any benefits that the activity will have for the local communities where the activity will be located:

The water supply system will benefit the communities of supply Zones 1, 2, 4 & 5 for the Seaview Area (i.e. Seaview, Beachview, Clarendon Marine, Kini Bay, Colleen) and Supply Zone 7 for the Greenbushes Area as well as the two existing informal settlements adjacent to the Seaview Pump Station Complex. The water supply system will also enhance the Nelson Mandela Bay's water security, thereby increasing investor confidence in the area.

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10. 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:	Administering authority:	Date:
National Environmental Management Act (NEMA) No. 107 of 1998 and Environmental Impact Assessment Regulations (Government Notice No. R. 983 & 985)	DEDEAT	NEMA: 1998 NEMA: EIA Regs: 2014
National Environmental Management: Protected Areas Act (NEMPAA) No 57 of 2003	DEA	2003
Nelson Mandela Bay Municipality Integrated Development Plan (IDP) 2015/2016	Nelson Mandela Bay Local Municipality	April 2015
National Forest Act No 94 of 1998	Department of Forestry and Fisheries	1998
National Water Act No 36 of 1998	DWS	1998
Provincial Nature Conservation Ordinance No 19 of 1974	DEDEAT	1974
Conservation of Agricultural Resources Act 43 of 1983 (Category 1,2 or 3)	Department of Agriculture	1983
National Heritage Resources Act, Act No. 25 of 1999	South African Heritage Resources Authority and Eastern Cape Provincial Heritage Resources Authority	1998

The section below was added by SRK Consulting and is additional to the information in the original Basic Assessment Report form:

POLICY AND LEGISLATIVE CONTEXT

National Environmental Management Act (Act No. 107 of 1998) (as amended)

The National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA] and the Environmental Impact Assessment Regulations (GN R 983 – 985, 04 December 2014) published there under, set out a set of schedules of listed activities that may not be undertaken without Environmental Authorisation from a competent authority. The Basic Assessment process is prescribed by the EIA Regulations (2014) as a prerequisite to obtaining a decision from the Department of Environmental Affairs (DEA) in terms of the NEMA for the listed activities applied for. The relevant listed activities are detailed below:

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Listed activity as described in GN R.983, 984 and 985	Description of project activity that triggers listed activity
<p>GN R. 983 Item 9: <i>The development of infrastructure exceeding 1,000 metres in length for the bulk transportation of water or storm water-</i></p> <p>(i) <i>with an internal diameter of 0,36 metres or more; or</i></p> <p>(ii) <i>with a peak throughput of 120 litres per second or more</i></p>	<p>Seaview 350 mm \varnothing uPVC Class 12 Gravity Main Pipeline will be $\pm 1,300$ m in length.</p> <p>Seaview 315 mm \varnothing uPVC \varnothing Class 18 Rising Main Pipeline will be $\pm 1,400$ m in length.</p> <p>Seaview Gravity Main – 250 mm \varnothing uPVC Class 12 Pipeline will be $\pm 2,900$ m in length.</p> <p>Greenbushes 900 mm Steel Pipeline will be 3,500 m in length.</p>
<p>GN R. 983 Item 45: <i>The expansion of infrastructure for the bulk transportation of water or storm water where the existing infrastructure-</i></p> <p>(i) <i>has an internal diameter of 0,36 metres or more; or</i></p> <p>(ii) <i>has a peak throughput of 120 litres per second or more; and</i></p> <p>(a) <i>where the facility or infrastructure is expanded by more than 1000 metres in length; or</i></p> <p>(b) <i>where the throughput capacity of the facility or infrastructure will be increased by 10% or more</i></p>	
<p>GN R. 983 Item 19: <i>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from-</i></p> <p>(i) <i>a watercourse</i></p>	<p>There a drainage line that crosses both the Seaview 350 mm diameter Gravity Main and 315 mm diameter Rising Main north of the existing Upper Seaview Steel Reservoir. A potential drainage line was also observed crossing a point on the preferred Option 1 250 mm \varnothing class 12 uPVC gravity main pipeline.</p>
<p>GN R. 985 Item 2: <i>The development of reservoirs for bulk water supply with a capacity of more than 250 cubic metres.</i></p> <p>(b) <i>In Eastern Cape:</i></p> <p>ii. <i>In a protected area identified in terms of NEMPAA, excluding conservancies;</i></p> <p>iii. <i>Outside urban areas, in:</i></p> <p>(dd) <i>Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</i></p> <p>(ff) <i>Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve</i></p>	<p>The construction of a 2.5 ML clear water bulk storage reservoir at the existing lower Seaview pump station complex within 5 kilometers of the Island Nature Reserve. The construction of a 2.5 ML clear water bulk storage reservoir at the Upper Seaview greenfield site located within the Island Nature Reserve. The Upper Seaview Reservoir also falls within the Vulnerable Algoa Sandstone Fynbos (code FFs 29) threatened ecosystem.</p>
<p>GN R. 985 Item 12: <i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for</i></p>	<p>Approximately 2,400 m² of vegetation within the Island Nature Reserve (which falls within the Vulnerable Algoa Sandstone Fynbos (code FFs 29) threatened ecosystem)</p>

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<p>maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p>(a) In Eastern Cape:</p> <p>i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</p> <p>ii. Within critical biodiversity areas identified in bioregional plans;</p> <p>iv. On land, where at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.</p>	<p>will be cleared for the establishment of the Upper Seaview Reservoir. Vegetation within the road reserve along the Greenbushes pipeline alignment may also need to be cleared. This alignment also falls within the Vulnerable Algoa Sandstone Fynbos (code FFs 29) threatened ecosystem.</p>
<p>GN R. 985 Item 14: The development of- <i>(xii) infrastructure or structures with a physical footprint of 10 square metres or more;</i></p> <p>(c) In Eastern Cape:</p> <p>ii. Outside urban areas, in:</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve</p>	<p>The Upper Seaview Reservoir will be more than 10 square metres in extent and falls within the Island Nature Reserve (which falls within the Vulnerable Algoa Sandstone Fynbos (code FFs 29) threatened ecosystem).</p>

National Water Act 1998 (Act 36 of 1998)

The presence of twelve wetlands / aquatic systems within 500m of the proposed scope of work requires the need for a Water Use Licence in terms of the National Water Act.



11. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

11(a) Solid waste management

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

YES	
-----	--

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

Approximately 20% of the excavated material may not be suitable for backfill and may need to be spoiled.

This is approximately 1,500 m³

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

Approximately 20% of excavated material may not be suitable for backfill and may need to be spoiled or disposed of at a registered landfill site. Should spoil sites be required they will be identified in conjunction with the ECO. All solid waste will be cleared regularly by the appointed building contractor. Litter collection bins will be provided and will be appropriately placed within the contractor's site camp and on site, and will be regularly cleared. Separation of waste and recycling of paper, glass, etc. will be encouraged. Burning or burying of waste will not be allowed. Unutilised construction materials will be removed once/ before construction has been completed.

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

Construction waste will be disposed of at the nearest municipal waste transfer station (i.e. Seaview Transfer Station) and ultimately disposed of at the Arlington landfill site.

Will the activity produce solid waste during its operational phase?

	NO
--	----

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

N/A	
-----	--

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

N/A

Where will the solid waste be disposed 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 relevant legislation?

	NO
--	----

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If yes, inform the competent authority and request a change to an application for scoping and EIA.
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.

11(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 ³

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

	NO
--	----

N/A

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:

Facility name:			
Contact person:			
Postal address:			
Postal code:			
Telephone:	Cell:		
E-mail:	Fax:		

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

N/A

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11(c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere?

YES	
	NO

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

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.

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

Construction:

Temporary emissions that may be generated during the construction phase are in the form of wind-blown dust from clearing, excavation and stockpiling activities as well as vehicle entrainment on dirt access roads and exhaust emissions from construction vehicles and equipment.

Operation:

No emissions will be generated during the operational phase of the activity.

11(d) Generation of noise

Will the activity generate noise?

YES	
	NO

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

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.

If no, describe the noise in terms of type and level:

Construction:

Noise generation will be forthcoming as a result of construction activities such as excavation of trenches using earth moving equipment and directional drilling under roads as well as the general movement of heavy vehicles. Impacts will however be temporary in nature and are not anticipated to be significant. Noise levels should be regulated by local municipal by-laws and will be limited to working hours (i.e. before 6h00 and after 18h00 Monday to Saturday and before 08h00 and after 14h00 on a Sunday).

Operation:

During operation, noise will be generated by the Seaview Pump Station, however the level of noise will not be any

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higher than current noise levels.

12. WATER USE

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

<input checked="" type="checkbox"/> municipal	<input type="checkbox"/> water board	<input type="checkbox"/> groundwater	<input type="checkbox"/> river, stream, dam or lake	<input type="checkbox"/> other	<input checked="" type="checkbox"/> the activity will not use water during operation
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Existing water infrastructure (reservoirs and pump station sites) will be used as water sources

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:

N/A
<input checked="" type="checkbox"/> YES

Does the activity require a water use permit from the Department of Water Affairs?

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If yes, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this application if it has been submitted.

Section 21 Water Uses

The Section 21 water uses are triggered by the Seaview and Greenbushes Bulk Water Infrastructure expansion being constructed within the DWS Regulated Area (500 m radius from wetlands and a 100 m radius from watercourses).

Exemptions

Note that according to section 6(2) of the General Authorisation (GNR 509 of 26 August 2016) all State Owned Companies (SOC's), and other institutions specified in Appendix D2 of the General Authorisation having lawful access to that property or land may on that property use water in terms of section 21(c) or (i) of the Act as specified under each of the relevant SOC's and other institution. Appendix D2 lists 'all 1.5 meter diameter and smaller pipe lines... crossings of rivers and wetlands outside the boundary of a wetland' from institutions to be generally authorised subject only to compliance to the conditions of the General Authorisation.

Therefore, all pipelines proposed outside wetland boundaries are already been generally authorised. Registration forms have been completed and are to be submitted to DWS shortly.

General Authorisation

The following proposed infrastructure triggers the requirement for an application in terms of Section 21 (c) & (i) as it falls within 500 m of a wetland or within a wetland boundary

- A new 2.5 ML clear water bulk storage reservoir (T.W.L = 160 mamsL) at the proposed Upper Seaview Bulk Storage greenfield reservoir site to gravity serve Zone 2 & 5. The entire footprint of 2,400 m² will be fenced;
- A new 750 mm (outside diameter) gravity main steel pipeline (purple line on the WULA Map), approximately 3,500 m in length, connecting the Greenbushes reservoir to the existing pipework near the existing Chelsea reservoir site;
- A new gravity main 350 mm \varnothing uPVC pipeline (pink line on the WULA Map), from the Seaview pump station complex to the new 2.5 ML Upper Seaview Bulk Storage Reservoir, approximately 1,300 m in length within an existing 5 m wide servitude; and
- A new pumping main, 315 mm diameter class 12 and 16 uPVC pipeline (yellow line on the WULA Map) from the Seaview pump station complex to the new Upper Seaview Bulk Storage Reservoir, approximately 1,400 m in length within an existing 5 m wide servitude.

According to the General Authorisation (GA) in terms of Section 39 of the National Water Act (Act no. 36 of 1998) gazetted on the 26 August 2016, the need for a water user to apply for a licence in terms of the National Water Act is replaced by this GA provided that the water use is within the limits and conditions of the GA. Upon completion of the Aquatic Specialist Study and Risk Assessment Matrix, it was concluded that all impacts identified poses only a LOW risk and the impacts to watercourses and resource quality is small and can be mitigated. It is SRK's belief that this Water Use should therefore constitute a GA Application.

All the required documents have been collated and completed and will be submitted to DWS once all forms have been signed by the relevant parties.



13. ENERGY EFFICIENCY

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

Potential energy efficiency may be achieved through the installation of improved pumps to reduce energy consumption. Besides the pumps, there is minimal scope for energy efficiency measures. Pre-construction planning will coordinate the contractor delivery movements to optimise travel costs and fuel usage.

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

No alternative energy sources have been considered.

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 C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C 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?

NO

If YES, please complete form for each specialist thus appointed:

All specialist reports must be contained in Appendix D.

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1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1: (Proposed Seaview Pump Station Complex 2.5 ML Reservoir)

1:50 – 1:20

Alternative S1: (Proposed Upper Seaview 2.5 ML Reservoir)

1:10 – 1:7,5

Alternative S1: (Existing Upper Seaview Steel Reservoir)

1:15 – 1:10

Alternative S1: (Three Existing Brick Reservoirs at the Seaview Pump Station Complex)

1:50 – 1:20

Alternative S1: (Access Road to Upper Seaview Reservoir)

1:15 – 1:10

Alternative S1: Option 1: Seaview Gravity Main – 250 mm \varnothing uPVC Class 12 Pipeline

1:50 – 1:20

Alternative S2: Option 2: Seaview Gravity Main – 250 mm \varnothing uPVC Class 12 Pipeline

1:50 – 1:20

Alternative S1: Seaview 350 mm \varnothing uPVC Class 12 Gravity Main Pipeline

1:20 – 1:15

Alternative S1: Seaview uPVC \varnothing Class 18 Pipeline

1:20 – 1:15

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Alternative S1: Greenbushes 900 mm Steel Pipeline

1:50 – 1:20

Alternative S1: (200mm \emptyset class 16 uPVC pipeline from Seaview Pump Station Complex parallel to Seaview Road)

1:10-1:7,5

See site gradient map attached to Appendix A.

2. LOCATION IN LANDSCAPE

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

- 2.1 Ridgeline
- 2.2 Plateau
- 2.3 Side slope of hill/mountain
- 2.4 Closed valley
- 2.5 Open valley
- 2.6 Plain
- 2.7 Undulating plain / low hills
- 2.8 Dune
- 2.9 Seafront



3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following (tick the appropriate boxes) – Refer to the soil and geology maps attached to Appendix A.

	S1: Seaview Pump Station Complex x 2.5 ML Reservoir	S1: Upper Seaview 2 ML Reservoir	S1: Existing Upper Seaview Steel Reservoir	S1: Three Existing Brick Reservoirs	S1: Access Road to Upper Seaview Reservoir	S1: Option 1: Seaview 250mm uPVC Class 16 Gravity Main	S2: Option 2: Seaview 250mm uPVC Class 16 Gravity Main	S1: Seaview 350 mm uPVC Class 12 Gravity Main	S1: Seaview 315mm uPVC Class 16 Pumping Main	S1: Greenbushes 900 mm Steel Pipeline	S1: 200mm uPVC Class 16 Gravity Main	S1: Seaview 315mm uPVC Class 16 Gravity Main	S1: Seaview 315mm uPVC Class 16 Pumping Main
Symbol on map	Green Point (Labelled)	Red Solid Line	Blue Point (Labelled)	Blue Point (Labelled)	Brown Dashed Line	Orange Dashed Line	Orange Solid Line	Pink Solid Line	Light Blue Solid Line	Purple Solid Line	Navy Solid Line	Green Solid Line	Yellow Solid Line
Shallow water table (less than 1.5m deep)	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES
Dolomite, sinkhole or doline areas	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
Seasonally wet soils (often close to water bodies)	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES	NO	YES
Unstable rocky slopes or steep slopes with loose soil	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

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	S1: Seaview Pump Station Complex 2.5 ML Reservoir	S1: Upper Seaview 2 ML Reservoir	S1: Existing Upper Seaview Steel Reservoir	S1: Three Existing Brick Reservoirs	S1: Access Road to Upper Seaview Reservoir	S1: Option 1: Seaview 250mm uPVC Class 16 Gravity Main	S2: Option 2: Seaview 250mm uPVC Class 16 Gravity Main	S1: Seaview 350 mm uPVC Class 12 Gravity Main	S1: Seaview 315mm uPVC Class 16 Pumping Main	S1: Greenbushes 900 mm Steel Pipeline	S1: 200mm uPVC Class 16 Gravity Main	S1: Seaview 315mm uPVC Class 16 Gravity Main	S1: Seaview 315mm uPVC Class 16 Pumping Main
Symbol on map	Green Point (Labelled)	Red Solid Line	Blue Point (Labelled)	Blue Point (Labelled)	Brown Dashed Line	Orange Dashed Line	Orange Solid Line	Pink Solid Line	Light Blue Solid Line	Purple Solid Line	Navy Solid Line	Green Solid Line	Yellow Solid Line
Dispersive soils (soils that dissolve in water)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Soils with high clay content (clay fraction more than 40%)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Any other unstable soil or geological feature	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
An area sensitive to erosion	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

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).

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The following information has been extracted from the Palaeontology Desktop Study (attached to Appendix D2 of this report):

The geology of the Port Elizabeth region has been outlined by Toerien and Hill (1989) and Le Roux (2000) and is shown in the geological map in Figure 3 below, abstracted from the 1: 250 000 geology sheet map 3324 Port Elizabeth (Council for Geoscience, Pretoria). The proposed bulk water infrastructure project areas are situated on the south coastal plain to the west of Port Elizabeth which is mantled here by thick aeolian (wind-blown) sand deposits of the Late Caenozoic Algoa Group (Toerien & Hill 1989, Le Roux 2000, Roberts et al. 2006).

As shown on the geological map included in Appendix A, the Greenbushes project area is underlain by coastal aeolianites of the Nanaga Formation (Algoa Group) of Pliocene to Early Pleistocene age. These ancient dune sands crop out extensively to the west and east of Port Elizabeth (Le Roux, 1992). In the Greenbushes area they unconformably overlie Palaeozoic sandstones and quartzites of the Peninsula Formation (Table Mountain Group) that crop out near-surface in the region. This Ordovician succession was laid down by braided streams and comprises cross-bedded sandstones and quartzites with occasional mudrock intervals and thin, pebbly conglomerates (Thamm & Johnson 2006).

The Nanaga beds comprise calcareous sandstones and sandy limestones that often display large scale aeolian cross-bedding, well seen, for example, in deep N2 roadcuts between Colchester and Grahamstown. They may reach thicknesses of 150 m or more (Maud & Botha, 2000). The Nanaga aeolianites are normally partially to well-consolidated, although unconsolidated sands also occur west of Port Elizabeth (Le Roux, 2000). The upper surface of the aeolianites weathers to calcrete and red, clay-rich soil, and the dune sands themselves may be profoundly reddened. The age of the palaeodunes decreases towards the modern coastline, reflecting marine regression (relative sea level fall) during the period of deposition. The oldest outcrops located furthest from the modern coast are the most elevated, having experienced some 30 m of uplift in the Pliocene, and may even be Miocene in age (Roberts et al., 2006). Typically the ancient dunes are preserved as undulating ridges of rounded hills trending parallel to the modern shoreline (Le Roux, 1992).

The Seaview project area overlies younger coastal aeolianites of the Schelm Hoek Formation (Algoa Group) that are of Holocene age. Modern aeolian calcareous sands of the Schelm Hoek Formation build still-active dune sands along the South Coast (Illenberger, 1992 & Le Roux, 2000). Deposition probably started during regression from the Mid Holocene transgressive maximum (i.e. the Flandrian transgression of 2-3 m amsl at 4000-3000 BP). The dune sands may be up to 140 m thick with an average of 30 m, and extend up to 6 km from the coast. Active sand dunes near the coast are unvegetated while those further inland are stabilized by dense dune thickets. In addition to unconsolidated, well-sorted, calcareous aeolian sands the Schelm Hoek Formation contains abundant shell middens of the Late Stone Age (Roberts et al., 2006, Webley & Hall, 1998). Palaeosols (ancient soil horizons) and peats are absent according to Le Roux (2000) whereas Illenberger (1992) as well as Goedhart and Hattingh (1997) record the presence of fossil soils. These Holocene dune deposits may be semi-consolidated at depth, and difficult to distinguish from the older, generally better cemented Nahoon Formation aeolianites (cf Almond, 2010).

The geology map included in Appendix A shows the locations of the proposed bulk water supply infrastructure developments at Seaview and Greenbushes. The Seaview project area is underlain by Quaternary to recent Aeolian sands of the Schelm Hoek Formation (Algoa Group). The Greenbushes project area is underlain by Plio-Pleistocene

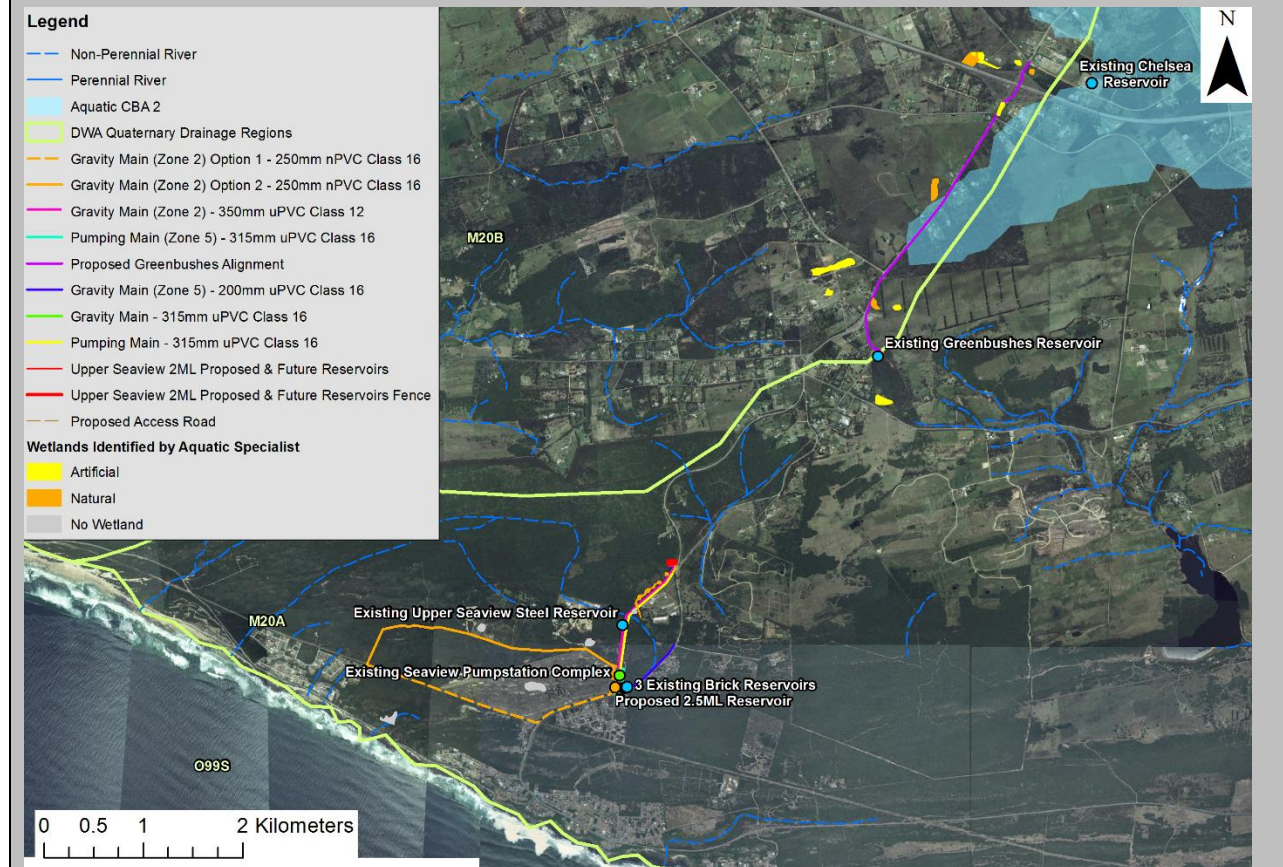
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aeolian sands of the Nanaga Formation (Algoa Group) that overlie Palaeozoic quartzites and sandstones of the Peninsula Formation (Table Mountain Group) at depth (taken from the Palaeontology Desktop Study included in Appendix D2, Almond, 2016).

The following information has been extracted from the Aquatic Specialist Impact Assessment (attached to Appendix D4 of this report):

Prof. George Bredenkamp was appointed to undertake an Aquatic Impact Assessment for the project. According to George, in terms of the definitions given in the National Water Act, 1998 (Act No. 36 of 1998), no rivers and very limited spruits (four drainage lines) were identified within 500 m from the alignment of the proposed pipelines (see Figure 4 below). However, natural pans and other wetlands do occur while some man-made dams (excavated or with a dam wall) do also occur. Most of the wetlands identified did not show obvious zonation. Of the 22 aquatic systems identified within a 500 m buffer of proposed construction activities, six are natural, six are artificial and ten sites contained no wetland (see Figure 4 below).



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Figure 4: Aquatic CBA and wetlands (map generated by SRK Consulting)

Refer to the Aquatic Impact Assessment attached to Appendix D4 for a description of each of the above assessed sites as well as their Present Ecological and Ecological Importance and Sensitivity Statuses. No wetlands were observed by the specialist at sites 13, 14 and 16-21.

A portion of the Greenbushes alignment falls within an Aquatic CBA 2 within quaternary catchment M20A (Baakens estuary). There is also a drainage line that crosses both the Seaview 350 mm diameter Gravity Main and 315 mm diameter Rising Main north of the existing Upper Seaview Steel Reservoir.

4. GROUNDCOVER

Indicate the types of groundcover present on the site:

- 4.1 Natural veld – good condition ^E
- 4.2 Natural veld – scattered aliens ^E
- 4.3 Natural veld with heavy alien infestation ^E
- 4.4 Veld dominated by alien species ^E
- 4.5 Gardens
- 4.6 Sport field
- 4.7 Cultivated land
- 4.8 Paved surface
- 4.9 Building or other structure
- 4.10 Bare soil

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 ^E	Natural veld with scattered aliens ^E	Natural veld with heavy alien infestation ^E	Veld dominated by alien species ^E	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.

Table 1 below describes the vegetation associated with each proposed activity based on the NMBM Bioregional Plan (refer to Appendix A for the NMBM Bioregional Plan vegetation map associated with the proposed scope of work).

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The Bioregional Plan is a spatial plan that shows terrestrial and aquatic features that are critical for conserving biodiversity and maintaining ecosystem functioning within the Nelson Mandela Bay Municipality. These areas are referred to as Critical Biodiversity Areas (CBA's). These areas are required to meet the municipality's biodiversity conservation targets. Such areas should be maintained in their natural state in perpetuity. A map of CBA's was produced as part of the NMBM's Conservation Assessment Plan (SRK Consulting, 2010) and sites were assigned CBA categories based on their biodiversity characteristics and Ecosystem Threat Status. Vegetation types have been classified in the Metro based on the extent of remaining area (currently not transformed) in relation to each vegetation type's biodiversity target (namely Critically Endangered, Endangered, Vulnerable or Least Threatened).

Refer to the CBA map in Appendix A. The construction of a 2.5 ML clear water bulk storage reservoir at the Upper Seaview greenfield site located within the Island Nature Reserve (Formal Protected Area) and Ecological Support Area (in terms of the NMBM Bioregional Plan). A small section of the Greenbushes pipeline alignment also falls within an Aquatic CBA 2 in terms of the Eastern Cape Biodiversity Conservation Plan. Sections of the Greenbushes pipeline alignment fall within a CBA. A small section of the Greenbushes pipeline alignment also falls within an Aquatic CBA 2 in terms of the Eastern Cape Biodiversity Conservation Plan.

The Upper Seaview Reservoir has been noted by the Department of Agriculture, Forestry and Fisheries to fall within declared State Forest. It is noted that The Forest Act of 1984 has been replaced by the National Forest Act of 1998. In terms of the latter Act, permits will be required in terms of Section 7 and 15 of this Act. Note that a licence in terms of the National Forest Act of 1998 was issued to the applicant by DAFF as part of the original application on the 21st of January 2010, however this licence has since expired (refer to Appendix G2). A new application will need to be lodged with DAFF prior to commencement of construction works.

Table 1: NMBM Bioregional Plan vegetation types and current vegetation condition of the study area

Activity	Vegetation Type
Proposed Seaview Pump Station Complex 2.5 ML Reservoir	Transformed/ grassed
Proposed Upper Seaview 2.5 ML Reservoir and proposed access road	Bushy Park Indian Ocean Forest – transformed by invasive alien plants
Seaview 350 mm \varnothing uPVC Class 12 Gravity Main Pipeline	Bushy Park Indian Ocean Forest and Sardinia Bay Forest Thicket - transformed as within the road reserve
Seaview uPVC Class 18 Pipeline	Bushy Park Indian Ocean Forest and Sardinia Bay Forest Thicket - transformed as within the road reserve
Existing Upper Seaview Steel Reservoir	Disturbed Bushy Park Indian Ocean Forest
Option 1: Seaview Gravity Main	Disturbed St Francis Dune Fynbos Thicket Mosaic within the Churchill pipeline servitude and disturbed Sardinia Bay Forest Thicket within the road reserve

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Option 2: Seaview Gravity Main	Natural St Francis Dune Fynbos Thicket Mosaic and transformed (Sardinia Bay Forest Thicket)
Greenbushes 900 mm Steel Pipeline	Colleen Glen Grassy Fynbos, Thornhill Forest and Thornveld and Kragga Kamma Indian Ocean Forest - transformed as within the road reserve
200mm ø class 16 uPVC pipeline from Seaview Pump Station Complex parallel to Seaview Road)	Sardinia Bay Forest Thicket. Some sections of the road reserve still pristine while others are invaded by tall <i>Eucalyptus sp.</i> invasive alien tree species.

The following table describes the Ecosystem Status of the above mentioned vegetation types – NMBM Bioregional Plan:

Table 2: Ecosystem status of vegetation types

Vegetation type	Ecosystem status
Bushy Park Indian Ocean Forest	Critically Endangered
Sardinia Bay Forest Thicket	Vulnerable
St Francis Dune Fynbos Thicket Mosaic	Endangered
Colleen Glen Grassy Fynbos	Critically Endangered
Thornhill Forest and Thornveld	Critically Endangered
Kragga Kamma Indian Ocean Forest	Critically Endangered

The National Environmental Management: Biodiversity Act provides a list of threatened terrestrial ecosystems (GN 1002). This has been established as little attention has historically been paid to the protection of ecosystems outside of protected areas. The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction. This includes preventing further degradation and loss of structure, function and composition of threatened ecosystems. The Greenbushes pipeline alignment falls within a threatened ecosystem classified by NEMBA as Vulnerable Algoa Sandstone Fynbos (code FFs 29).

Mr Jamie Pote conducted a Species of Special Concern (SSC) Survey (attached to Appendix D of this report) of the following pipeline alignments:

- Proposed 350 mm ø uPVC Class 12 Gravity Main (within the road reserve);
- Proposed 315 mm ø uPVC Class 18 Rising Main (within the road reserve);
- Alternative Option 2: Proposed 250 mm ø uPVC Class 12 Gravity Main; and
- Proposed Greenbushes 900 mm Gravity Main Steel Pipeline (within the road reserve).

The Vegetation Specialist identified at least twelve plant species of special concern that occur within the study area and will be potentially destroyed by construction activities (see Table 3 below). However most of these species tend to have widespread distributions and would thus not be under any significant threat as a result of proposed construction works.

Table 3: List of plant species of special concern identified in the study area

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Botanical Name	Family	Status
<i>Acrolophia capensis</i>	Orchidaceae	PNCO
<i>Astephanus marginatus</i>	Apocynaceae	PNCO
<i>Carpobrotus edulis</i>	Mesembryanthemaceae	PNCO
<i>Carpobrotus sp.</i>	Mesembryanthemaceae	PNCO
<i>Cynanchum sp.</i>	Apocynaceae	PNCO
<i>Erica chloroloma</i>	Ericaceae	PNCO
Indet.	Scrophulariaceae	PNCO
Indet.	Rutaceae	PNCO
Indet.	Restionaceae	PNCO
<i>Scadoxus puniceus</i>	Amaryllidaceae	PNCO
<i>Secamone alpinii</i>	Apocynaceae	PNCO
<i>Sideroxylon inerme</i>	Sapotaceae	NFA

The following findings from his study were made:

- The majority of species present within or adjacent to the proposed servitude tend to have widespread distributions and would thus not be under any significant threat as a result of water pipeline construction. Species (such as trees and cosmopolitan species that are however protected by the legislation) are not necessarily suited to relocation and permits must be obtained before destruction from the relevant departments (Department of Water Affairs and Forestry for NFA listed species and Department of Economic Development and Environmental Affairs for PNCO listed species);
- No IUCN Red Listed species were found to occur within the proposed servitude;
- Dormant species including bulbs and species belonging to the *Iridaceae* family were not observed but may be present within the proposed servitude. These should be relocated during the construction phase if necessary. The species noted will require permits from the respective departments where appropriate; and
- CARA listed species require removal as per Conservation of Agricultural Resources Act and a management plan should be incorporated into the EMPr to retain the servitude invasive free.

It is noted by SRK that some of these pipeline alignments are also located within the road reserve. Section 63 (b)(ii) of the Provincial Nature Conservation Ordinance No 19 of 1974 states that 'No person shall without a permit pick any flora on a public road or on the and on either side of such road within a distance of ninety metres from the centre of such road'. Pick is defined by the Act and includes cut, chop off, take, gather, pluck, uproot, break, damage or destroy. Any Species of Special Concern within the road reserve therefore require a permit for destruction. The Vegetation Specialist has furthermore recommended that any *Acrolophia capensis* and *Scadoxus puniceus* species (Protected by the Provincial Nature Conservation Ordinance of 1974) within any areas to be destroyed be translocated.

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5. 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:

- 5.1 Natural area
- 5.2 Low density residential
- 5.3 Medium density residential
- 5.4 High density residential
- 5.5 Informal residential
- 5.6 Retail commercial & warehousing
- 5.7 Light industrial
- 5.8 Medium industrial ^{AN}
- 5.9 Heavy industrial ^{AN}
- 5.10 Power station
- 5.11 Office/consulting room
- 5.12 Military or police base/station/compound
- 5.13 Spoil heap or slimes dam^A
- 5.14 Quarry, sand or borrow pit
- 5.15 Dam or reservoir
- 5.16 Hospital/medical centre
- 5.17 School
- 5.18 Tertiary education facility
- 5.19 Church
- 5.20 Old age home
- 5.21 Sewage treatment plant^A
- 5.22 Train station or shunting yard ^N
- 5.23 Railway line ^N
- 5.24 Major road (4 lanes or more) ^N
- 5.25 Airport ^N
- 5.26 Harbour
- 5.27 Sport facilities
- 5.28 Golf course
- 5.29 Polo fields
- 5.30 Filling station ^H
- 5.31 Landfill or waste treatment site
- 5.32 Plantation
- 5.33 Agriculture
- 5.34 River, stream or wetland
- 5.35 Nature conservation area
- 5.36 Mountain, koppie or ridge
- 5.37 Museum
- 5.38 Historical building
- 5.39 Protected Area



- 5.40 Graveyard
- 5.41 Archaeological site
- 5.42 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.
If YES, specify and explain:

There is an airstrip on Portion 1/28 (in close proximity to Option 1,205 mm diameter uPVC Class 12 Gravity Main Pipeline Alignment). However aircraft landing activities should not be affected by proposed construction works.

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

N/A

6. 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 palaeontological sites, on or close (within 20m) to the site?

Unknown

No

If YES, explain: N/A

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

Briefly explain the findings of the specialist: Archaeological Impact Assessment

Ms Celeste Booth conducted an Archaeological Impact Assessment for the proposed project. A copy of her report is attached to Appendix D1 of this report. The following findings were made:

No archaeological heritage remains, features, or sites were observed within accessible areas investigated for the proposed expansion of the bulk water supply. It must be noted that the investigation was limited to the surface as well as the exposed and disturbed surface areas.

Most of the investigated area was covered in dense grass, tree and shrub vegetation, especially within the road reserves and adjacent areas. These areas have also been heavily disturbed over time owing to the construction of the tar roads and continued maintained as well as associated infrastructure such as culverts, signage and drainage areas.

Similarly the proposed infrastructure that follows the gravel road from the proposed reservoir is covered in dense grass and thicket vegetation. No significant heritage features were located at the

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area proposed for the Reservoir (“2.5ML Reservoir”).

Although no archaeological heritage material, features and sites were observed during the survey it is possible that heritage resources may be uncovered within the areas not investigated during the survey, presumably these are undisturbed areas and may possible contain in situ archaeological sites and materials associated with coastal settlement, such as shell middens.

It is recommended that the area for the expansion of the bulk water supply infrastructure of potable water to Seaview and Greenbushes Supply Areas, Nelson Mandela Bay Metropolitan, Eastern Cape Province, is exempted from a full Phase 1 Archaeological Impact Assessment. The proposed area for development is of *low archaeological cultural sensitivity*. No archaeological heritage sites, features, or remains were documented during the survey, although it is possible that archaeological heritage material may occur below the surface. Taking into consideration the recommendation below, the development may proceed as planned.

There were no archaeological artefacts located during the assessment carried out. If any archaeological or heritage material were to be discovered it is very unlikely that it would be in situ. However, there is always a possibility that human remains or other archaeological and historical material may be uncovered during the development. Such material must be reported to the Eastern Cape Provincial Heritage Resources Agency (ECPHRA) (043 745 0888) or the Albany Museum (046 622 2312) if exposed.

Palaeontology Desktop Study

Mr John Almond conducted a Palaeontology Desktop Study for the proposed project. A copy of his report is attached to Appendix D2 of this report. The following findings were made:

The palaeontological record of the rock units represented in the study area has been reviewed by Almond (2010; see numerous references therein).

Fossils in the **Peninsula Formation** consist only of a small range of trace fossils (burrows, trackways *etc*) and organic-walled microfossils associated with the occasional marine-influenced mudrock intervals, which are usually very poorly exposed at surface. Low-diversity trace fossil assemblages have been recorded from a Peninsula Formation succession near Humansdorp (Almond 2012). The Table Mountain Group sediments in the Eastern Cape have often suffered high levels of tectonic deformation, compromising preservation of fossils, especially within the less resistant mudrock horizons. The palaeontological sensitivity of the Peninsula Formation here, as well as of the overlying superficial sediments (downwasted gravels, colluvium, soils, pedocretes *etc*) is considered to be generally *low* (Almond *et al.* 2008).

The sparse palaeontological record of the Pliocene to Early Pleistocene **Nanaga Formation** is

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summarised by Le Roux (1992) and Almond (2010). The fossil biota consists of fragmentary marine shells, foraminifera (shelled protozoans), and a small range of terrestrial snails (eg *Achatina*, *Tropidophora*, *Trigonephrus*, *Natalina*). Dense arrays of calcretised rhizoliths (root casts) commonly occur in these and contemporary Plio-Pleistocene aeolianites along the southern and southwestern coast. A wider range of terrestrial fossils might be found here in future, albeit only rarely due to extensive post-depositional diagenesis (e.g. solution and reprecipitation of carbonate by groundwater). They might include mammal remains from hyaena lairs, such as are recorded from contemporary Langebaan Formation aeolianites in the SW Cape (Roberts *et al.*, 2006 and refs therein).

The overall palaeontological sensitivity of the Nanaga Formation is assessed as LOW, although pockets of locally HIGH sensitivity may occur locally.

An authoritative review of the palaeontological potential of Quaternary coastal sands of the Cape region, including the **Schelm Hoek Formation**, is provided by Pether (2008); see also the short review by Almond (2010). Categories of scientifically valuable fossils mentioned by Pether (*ibid.*) and others that may be preserved in these sands include:

- rare fossil bones, teeth and other remains of mammals (e.g. rhino, elephant, bovids, moles), reptiles (e.g. tortoises, lizards), and ostriches (e.g. egg shells);
- terrestrial gastropods;
- plant remains such as charcoal, decayed plant roots;
- calcareous and siliceous microfossils (foraminiferans, ostracods, diatoms, shell fragments, calcareous algae, echinoid spines);
- organic-walled microfossils (pollen, spores) from mudrocks deposited in interdune ponds and vleis, which may also contain fossil frogs, fish, aquatic snails and plant macrofossils (reeds, leaves, seeds, roots etc); and
- trace fossils (e.g. mole and arthropod burrows, vertebrate tracks).

Illenberger (1992) records fragmentary remains of molluscs, calcareous algae, and sea urchins as well as foraminiferans, terrestrial snails (e.g. *Achatina*, *Trigonephrus*) and root casts (rhizoliths) from the Schelm Hoek Formation in particular. Shell middens close to open beaches are dominated by white sand mussels (*Donax serra*) but also contain remains of marine and terrestrial mammals, stone artifacts, bone tools and occasionally pottery.

The overall palaeontological sensitivity of the Schelm Hoek Formation is assessed as LOW, although pockets of locally HIGH sensitivity may occur locally.

The proposed bulk water supply developments in the Seaview and Greenbushes area overlie Late Caenozoic aeolian sand deposits and are rated as of LOW (negative) significance in terms of

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potential impacts on local palaeontological heritage. This is because (1) the sedimentary rocks underlying the site (Nanaga and Schelm Hoek Formations of the Algoa Group) are of generally low palaeontological sensitivity, while (2) the project footprint is comparatively small, with little bedrock excavation envisaged.

It is therefore recommended that, pending the potential discovery of well-preserved chance fossil finds during excavation, exemption from further specialist palaeontological studies and mitigation should be granted for the proposed bulk water supply developments for Greenbushes and Seaview.

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

Unknown
Unknown

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

If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

The section below was added by SRK Consulting and is additional to the information in the original Basic Assessment Report form:

SOCIO-ECONOMIC CONTEXT OF THE SURROUNDING AREA

Poverty and other social challenges contribute to low education levels within the metropolitan, with 3 % of the population have no schooling, while 13 % have Grade 7 or less and 75 % have Grade 12 or less.

According to the latest NMBM IDP (2015/2016) 36.48 % of the working age population is employed, 21.02 % are unemployed, 5.26 % of the population are discouraged work-seekers while the remaining 36.46 % are not economically active. These statistics clearly show that the Nelson Mandela Metropolitan still faces high levels of unemployment, which may be attributed to a decline in economic growth.

71 239 of the total number of 276,850 households within the metropolitan are classified as indigent. This essentially means that approximately 30% of the population are dependent on the municipality, while roughly 44 % of the population access at least one social grant.

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SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by—

- (a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the competent authority) at a place conspicuous to the public at the boundary or on the fence of—
 - (i) the site where the activity to which the application relates is or is to be undertaken; and
 - (ii) any alternative site mentioned in the application;
- (b) giving written notice to—
 - (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
 - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
 - (v) the municipality which has jurisdiction in the area;
 - (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
 - (vii) any other party as required by the competent authority;
- (c) placing an advertisement in—
 - (i) one local newspaper; or
 - (ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
- (d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or local municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in subregulation 54(c)(ii); and
- (e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to—
 - (i) illiteracy;
 - (ii) disability; or
 - (iii) any other disadvantage.



2. CONTENT OF ADVERTISEMENTS AND NOTICES

A notice board, advertisement or notices must:

- (a) indicate the details of the application which is subjected to public participation; and
- (b) state—
 - (i) that the application has been submitted to the competent authority in terms of these Regulations, as the case may be;
 - (ii) whether basic assessment or scoping procedures are being applied to the application, in the case of an application for environmental authorisation;
 - (iii) the nature and location of the activity to which the application relates;
 - (iv) where further information on the application or activity can be obtained; and
 - (iv) the manner in which and the person to whom representations in respect of the application may be made.

3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for all alternatives.

4. DETERMINATION OF APPROPRIATE MEASURES

The practitioner must ensure that the public participation is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate. Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

5. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before the application 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 this application. The comments and response report must be attached under Appendix E.

6. AUTHORITY PARTICIPATION

Authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the

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environmental sections of the local authority must be informed of the application at least 30 (thirty) calendar days before the submission of the application.

List of authorities informed:

- Department of Economic Development, Environmental Affairs & Tourism
- Department of Water & Sanitation;
- Eastern Cape Provincial Heritage Agency;
- Department of Roads and Public Works; and
- Department of Agriculture, Forestry & Fisheries.

List of authorities from whom comments have been received:

Department of Agriculture, Forestry & Fisheries.

7. CONSULTATION WITH OTHER STAKEHOLDERS

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

Any stakeholder that has a direct interest in the site or property, such as servitude holders and service providers, should be informed of the application at least 30 (thirty) calendar days before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?

YES

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

- Concern regarding proximity of the Island Nature Reserve to the proposed project;
- Proposed infrastructure located within Critical Biodiversity Areas 1 and 2 according to the Eastern Cape Biodiversity Conservation Plan;
- Suggests alternative routes and / or locations for the proposed 315 pumping and 350 mm gravity mains as well as for the reservoir proposed within the Island Nature Reserve;
- Design requirements in respect of the pipeline;
- Clarification on the motivation of the position of the Upper Seaview Reservoir within the Island Nature Reserve;
- Comment on the presence of State Forest within the study area and the need for permits under the National Forest Act of 1998;
- Comment on the Vegmap in the Aquatic Specialist Report;
- Comment on the Botanical Specialist Report;
- Comment that bulk infrastructure is considered an exceptional circumstance;
- Comment on future development proposed within natural forest.

Please refer to Table 2 of Appendix E (Comments and Response Report).

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SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2010, 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. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties.

- a) Request for registration as Interested & Affected Party;
- b) Request for confirmation that the proposed project will include the needs of Kini Bay residents;
- c) Concern regarding the water supply for Kini Bay as reservoir silts up and no repairs have been effected;
- d) Project will be a positive development due to the drought in the city;
- e) Proximity of reservoir and infrastructure to Island Nature Reserve; and
- f) Specific design requirements in respect of pipeline.

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached to this report):

- a) Registered on IAP database;
- b and c) The Kini Bay pipeline and associated works e.g. demolition of the reservoir, is no longer within the scope of this study. It has been included as part of another phase for implementation in the future;
- d) The proposed infrastructure will ensure efficient storage and reticulation of water to the relevant NMBM water supply zones of the available water. Note that additional water will not be available;
- e) The proposed 2.5 ML Upper Seaview Reservoir site falls within The Island Nature Reserve and pipelines towards and from the reservoir will also be installed in close proximity to this reserve (see activity description and the relevant maps in the report). Note that the project team went through a process of trying to locate alternative sites for the relevant infrastructure, however due to the elevation requirement of the reservoir in order to be able to gravity feed into the Seaview Pump Station Complex, no other site in the surrounding area could be located. See section 2 of the Pre-Application Draft Basic Assessment Report (this report) for a discussion on project alternatives. The potential impacts of the proposed infrastructure are discussed in section D of the DBAR report.; and
- f) Design comments noted and forwarded to the project engineers.

See the complete list of responses to issues raised in the Comments and Responses Tables in Appendix E6.



2. 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

List the potential direct, indirect and cumulative property/activity/design/technology/operational alternative related impacts (as appropriate) 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.

The section below was added by SRK Consulting and is additional to the information in the original Basic Assessment Report form:

The identification of potential impacts of the proposed activity is based on the following factors:

- The legal requirements;
- The nature of the proposed activity;
- The nature of the receiving environment; and
- Issues raised during the public participation process.

Considering the factors listed above, a number of potential environmental impacts which could potentially result from the proposed works have been identified. These are discussed in this section.

With regards to the two alternative alignments (Option 1 and Option 2) for the Seaview Gravity Main 250 mm ø uPVC Class 12 Pipeline, please note that impact ratings for both options are the same except where stated differently.

It is noted that ratings are given for the impact predicted over the whole project and entire lengths of the proposed pipeline alignments. It is recognised that there may be cases where the significance of an impact at an individual location may be different from the overall significance rating. In such instances, the highest significance rating shall be reflected and it shall be dealt with through the mitigation measures recommended below and are understood to be acceptable with these mitigation measures in place.

Planning/ Design Phase
Alternative (preferred alternative)
Direct Impacts:
None
Indirect Impacts:
None

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Cumulative Impacts:

None

No-go alternative

If the proposed project does not proceed as planned, the positive and negative impacts relating to the planning and design will not arise. Most importantly, the status quo will prevail.

Construction Phase

Construction is expected to continue over a period of 16 months.

Alternative (preferred alternative)

Direct impacts:

1. Waste Management

1a) Solid Waste

Construction waste as well as small amounts of domestic waste will be generated. Lack of proper management of the waste on the site may lead to wind-blown litter and contamination. Pollution and accumulation of construction waste such as rubble, creates a negative visual impact and could potentially have an impact on surrounding natural ecosystems.

The significance rating for this impact is VERY LOW (-ve) without mitigation. If appropriate mitigation is implemented, the impact could be reduced to INSIGNIFICANT.

Mitigation Measures:

- All non-hazardous waste generated on site shall be collected and appropriately disposed of at a registered municipal landfill site;
- Appropriate scavenger-proof solid waste receptacles fitted with lids must be provided and must be regularly emptied. The contractor shall be responsible for the disposal of domestic waste generated as a result of work activities;
- Recycling of waste per waste stream and reuse of waste where possible must be undertaken. Waste receptacles should be labelled accordingly;
- Where possible, waste should be recycled and re-used;
- No waste is to be buried or burned on the site;
- Littering and contamination of ground or water sources during construction must be prevented by effective construction camp management;
- Littering is strictly prohibited. Litter shall be disposed of in the on-site bins;
- Records of disposal of all waste generated on site shall be maintained; and
- All temporary soil stockpiles, construction materials, litter and rubble must be removed on completion of construction activities. No dumping or burning of waste material is permitted.

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1b) Sewage Management

Sewage will be generated at construction sites and if workers do not use provided chemical toilet and/ or ablution facilities sewage could potentially result in soil and surface water contamination.

The significance rating for this impact is VERY LOW (-ve) without mitigation. If appropriate mitigation is implemented, the impact could be reduced to INSIGNIFICANT.

Mitigation Measures:

- Chemical toilets must be provided for workers and these must be regularly serviced (and proof of correct sewage disposal maintained for auditing purposes);
- Toilets are to be provided by the contractor for workers at a ratio of at least 1 toilet per 20 workers or as per specifications of the supplier, and must be situated in close proximity to all work areas;
- The construction camp and necessary ablution facilities meant for construction workers must be beyond the 32m of any of the watercourses;
- Prohibit the use of natural areas as toilets; and
- Monitor the sewerage facilities for spillages, and handle any spillages as hazardous waste.

1c) Hazardous Substances and Waste Management

Hazardous substances such as cement, tar/bitumen and diesel/oil all have the potential to contaminate water sources and the surrounding environment (soil, surface/groundwater, etc.) if not managed properly.

The significance rating for this impact is VERY LOW (-ve) without mitigation. If appropriate mitigation is implemented, the impact could be reduced to INSIGNIFICANT.

Mitigation Measures:

- No waste water or hazardous substances will be disposed of into the surrounding environment;
- Storage areas for hazardous material must be concreted, bunded, covered, labelled and well ventilated;
- All fuel, oil and other hydrocarbon storage areas will be bunded to contain 110% of the stored volume;
- Bunded areas will be constructed of a material impermeable to the hazardous substance stored within;
- The bunded areas will be constructed with an internal sump whereby spillages will easily flow and allow for easy clean up;
- Bunded areas will be clearly marked with their volume capacity and appropriate safety signage;
- Spill kits to be made available at areas of possible spillages of hazardous substances;
- Rainwater entering the bunded areas, will be considered hazardous and will be treated as such;
- Should the bunded areas be damaged, this will be immediately rectified;
- Maintenance of equipment on site is prohibited;
- Drip trays must be in place under all leaking equipment and during re-fuelling of equipment;
- Contaminated soils and materials should be disposed of in a separate hazardous waste bin prior to collection and disposal; and
- All hazardous waste must be disposed of at a registered hazardous waste disposal facility and proof of disposal maintained.



Should cement be used on site, the following guidelines apply:

- Carefully control all on-site operations that involve the use of cement and concrete;
- Limit cement and concrete mixing to single sites where possible;
- Use plastic trays or liners when mixing cement and concrete: Do not mix cement and concrete directly on the ground;
- Dispose of all visible remains of excess cement, cement bags and concrete after the completion of tasks at a licensed waste disposal facility; and
- Dispose of in the approved manner (solid waste concrete may be treated as inert construction rubble, but wet cement and liquid slurry, as well as cement powder must be treated as hazardous waste).

2. Nuisance Impacts

2a) Noise Impacts

Noise generation (and potential vibrations) will be forthcoming as a result of construction activities such as excavation of trenches using earth moving equipment and directional drilling under roads as well as the general movement of heavy vehicles. Impacts will however be temporary in nature and are not anticipated to be significant. Noise levels should be regulated by local municipal by-laws and will be limited to working hours (06h00-18h00 Mondays – Saturdays and 08h00 – 14h00 on Sundays).

The significance rating for this impact is VERY LOW (-ve) without mitigation. Even with mitigation, the significance of this impact remains VERY LOW.

Mitigation Measures:

- Construction activities to be limited to normal working hours 06h00-18h00 Mondays – Saturdays and 08h00 – 14h00 on Sundays);
- Should after-hours work be required, residents must be given notice before-hand;
- All operations should meet the noise standard requirements of the Occupational Health and Safety Act (Act No 85 of 1993);
- No sound amplification equipment such as sirens, loud hailers or hooters are to be used on site except in emergencies and no amplified music is to be permitted on site;
- Equipment that is fitted with noise reduction facilities (e.g. side flaps, silencers, etc.) must be used as per operating instructions and maintained properly during site operations;
- Maintain construction equipment and vehicles in good working order; and
- A complaints register must be made available and should any complaints be received, these should be logged in the complaints register and reported to the responsible person on site.

2b) Impacts on Air Quality

Temporary emissions that may be generated during the construction phase are in the form of wind-blown dust from clearing, excavation and stockpiling activities as well as vehicle entrainment on dirt access roads and exhaust

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emissions from construction vehicles and equipment. These impacts will likely be most experienced by vehicles and pedestrian by-passers adjacent to the road reserve.

The significance rating for this impact is VERY LOW (-ve) without mitigation. If appropriate mitigation is implemented, the impact could be reduced to INSIGNIFICANT.

Mitigation Measures:

- Dust suppression measures (e.g. dust shields and wetting) need to be implemented to reduce the liberation of dust (especially under windy conditions and in high traffic areas);
- Limit vehicle speeds on the site for all vehicles;
- Construction footprints must be demarcated to minimise unnecessary clearing of vegetation and disturbance to soils;
- Avoid clearing of vegetation until such time excavations are required;
- Excavation of trenches as well as clearing of vegetation to be conducted in a phased manner;
- An environmental complaints register must be made available and should any complaints be received (including dust complaints), these should be logged in the complaints register and reported to the responsible person on site. The register must list:
 - Complainant name and contact details;
 - Date complaint was lodged;
 - Person who recorded complaint;
 - Nature of complaint;
 - Actions taken to investigate the complaint and outcome of the investigation;
 - Action taken to remedy the situation;
 - Date on which feedback was provided to complainant;
- Subsoil from trenches must be used for backfill and should additional material be left, it should be disposed of to landfill;
- If possible, locate soil stockpiles in sheltered areas where they are not exposed to wind;
- Topsoil stockpiles must be used for rehabilitation;
- There should be strict speed limits on dusty roads (i.e. not more than 40km per hour); and
- Bare surfaces must be rehabilitated as soon as possible with indigenous vegetation that will be able to grow in the area.

3 Impacts on Heritage

3a) Archaeological Heritage

No archaeological heritage remains, features, or sites were observed within accessible areas investigated for the proposed expansion of the bulk water supply. It must be noted that the investigation was limited to the surface as well as the exposed and disturbed surface areas. **The proposed area for development is of low archaeological cultural sensitivity.** Although no archaeological heritage material, features and sites were observed during the survey it is possible that heritage resources may be uncovered within the areas not investigated during the survey, presumably these are undisturbed areas and may possibly contain in situ archaeological sites and materials

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associated with coastal settlement, such as shell middens. Refer to Appendix D1 for the Archaeology Impact Assessment.

The significance rating for this impact is LOW (-ve) without mitigation. If appropriate mitigation is implemented, the impact could be reduced to VERY LOW.

The following mitigation measures were made by the Archaeological Specialist:

- An archaeologist should be appointed to monitor the vegetation clearing of the areas that could not be covered during the survey owing to inaccessibility. Further recommendations on whether an archaeologist should conduct further monitoring during the excavations for the infrastructure or possible phase 2 mitigation should be at the discretion of the appointed archaeologist monitoring the area on the results of the vegetation clearing;
- The environmental control officer (ECO) as well as the construction managers/ foremen should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites; and
- If concentrations of archaeological and/ or historical heritage material, marine shells, and / or human remains are uncovered during construction, all work must cease immediately and be reported to the Albany Museum (Tel. 046 622 2312) and/or the Eastern Cape Provincial Heritage Resources Agency (ECPHRA) (Tel. 043 745 0888) so that systematic and professional investigation/ excavation can be undertaken.

3b) Impacts on Cultural/ Historical Heritage: *Demolition of abandoned structures*

The three brick reservoirs south of the Seaview Complex Pump Station are currently in poor condition and it is proposed that these reservoirs, as well as the Upper Seaview Steel Reservoir may potentially be demolished.

Since it is uncertain at this stage whether these will be demolished, the impact has not been rated. Mitigation measures must be adhered to should these structures need to be demolished.

The following recommendation was made by SRK Consulting under the design phase:

- Before the commencement of construction activities, a historian must be appointed to provide input regarding the age and historical value of the potential heritage structures (i.e. brick reservoirs at Seaview Pump Station Complex and Upper Seaview Steel Reservoir) should they need to be demolished, and whether a permit would be required before demolition.

3c) Palaeontological Impacts

Disturbance, damage, destruction or sealing-in of scientifically important fossil remains preserved at or beneath the ground surface within the development footprint, could occur most notably by bedrock excavations and surface



clearance during the construction phase of the bulk water infrastructure.

The proposed bulk water supply developments in the Seaview and Greenbushes area overlie Late Caenozoic aeolian (i.e. wind-blown) sand deposits and are rated as of **low (negative) significance** in terms of potential impacts on local palaeontological heritage. This is because the sedimentary rocks underlying the site (Nanaga and Schelm Hoek Formations of the Algoa Group) are of generally low palaeontological sensitivity, while the project footprint is comparatively small, with little bedrock excavation envisaged. Refer to Appendix D2 for the Palaeontology Desktop Study.

The significance rating for this impact is LOW (-ve) without mitigation. If appropriate mitigation is implemented, the impact could be reduced to VERY LOW.

The following mitigation measures were made by the Paleontological Specialist:

- Monitoring of all substantial (> 1m) bedrock excavations on an on-going basis for chance fossil finds (e.g. petrified wood, shells, bones & teeth) by ECO;
- Reporting of new palaeontological finds to ECPHRA for possible specialist mitigation. Should any well-preserved fossil remains (e.g. vertebrate bones and teeth, petrified wood, plant or trace fossil assemblages, fossil shells) be encountered during excavation, these should be safeguarded, preferably in situ, and reported by the ECO to ECPHRA (i.e. The Eastern Cape Provincial Heritage Resources Authority. Contact details: Mr Sello Mokhanya, 74 Alexander Road, King Williams Town 5600; smokhanya@ecphra.org.za and/or the Albany Museum, Somerset Street, Grahamstown (+27 46 622 2312)). This is necessary so that so that the fossil specimens may be professionally examined, recorded and, if necessary, excavated at the developer's expense; and
- The specialist involved would require a collection permit from SAHRA (Contact details: Mrs Colette Scheermeyer, P.O. Box 4637, Cape Town 8000; Tel: 021 462 4502; Email: cscheermeyer@sahra.org.za). Fossil material must be curated in an approved repository (e.g. museum or university collection) and all fieldwork and reports should meet the minimum standards for palaeontological impact studies developed by SAHRA.

4. Impacts on Terrestrial Ecology

4a) Loss of vegetation and habitat

Clearing of vegetation as well as in-filling and cutting of landforms for infrastructure will result in loss of vegetation and disturbance to natural habitats. According to the NMBM Bioregional Plan, most of the vegetation types that fall within the study area are classified critically endangered, endangered or vulnerable. Furthermore, the proposed Upper Seaview Reservoir and access road as well as the road reserve for sections of the Seaview 350 mm Gravity Main pipeline and 315 mm Rising Main pipeline fall within a protected area known as the Island Nature Reserve. Moreover the Greenbushes pipeline alignment falls within a threatened ecosystem classified by the National Environmental Management: Biodiversity Act (G 34809, GoN 1002, 9 December 2011) Vulnerable Algoa Sandstone

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Fynbos (code FFs 29) as well as within a terrestrial CBA (Refer to maps in Appendix A).

The majority of construction works however occurs within the road reserve with vegetation and habitat that has been previously disturbed. Furthermore, being a linear activity the area of clearing of the various habitat types will be very limited in comparison to the larger extent of local/ regional habitats/ ecosystems.

Excessive damage to dense vegetation (beyond the construction footprint) should be avoided within pipeline servitudes and most importantly the Island Nature Reserve greenfield site for the proposed 2.5 ML Upper Seaview Reservoir. Clearing activities and pre-construction designs must allow for demarcation planning (e.g. fence line demarcation at the proposed Seaview Reservoir).

The significance rating for this impact is LOW (-ve) without mitigation. Even with mitigation, the significance of this impact remains LOW.

Options 1 versus Option 2 of 250 mm ø class 12 uPVC gravity main pipeline alignment:

Option 1 is preferred as it will have less of a disturbance impact on vegetation and faunal habitat. The significance rating for this impact was lower (i.e. LOW (-ve) reduced to INSIGNIFICANT with mitigation) than that of option 2 (i.e. MEDIUM (-ve) and remains MEDIUM as mitigation is not possible).

4b) Impact on local biodiversity and loss of plant SSC and protected trees

Vegetation clearing will result in the loss of potential threatened, rare, endemic or protected plant species (e.g. Photo 11). The Vegetation Specialist identified at least twelve plant species of special concern that occur within the study area and will be potentially destroyed by construction activities (See Table 3 in this report). Some of the pipeline alignments are located within the road reserve. Section 63 (b)(ii) of the Provincial Nature Conservation Ordinance No 19 of 1974 – *No person shall without a permit pick any flora...* Pick is defined by the Act and includes cut, chop off, take, gather, pluck, uproot, break, damage or destroy. Any Species of Special Concern within the road reserve, or other natural areas, therefore requires a permit for destruction. However most of these species tend to have widespread distributions and would thus not be under any significant threat as a result of proposed construction works.

The significance rating for this impact is MEDIUM (-ve) without mitigation. If appropriate mitigation is implemented, the impact could be reduced to LOW.

Options 1 versus Option 2 of 250 mm ø class 12 uPVC gravity main pipeline alignment:

Option 1 is preferred as it will have less of a disturbance impact on vegetation and habitat (impact rating of LOW (-ve) significance which can be reduced to INSIGNIFICANT with mitigation). Option 2 will require the clearing of a new servitude through untouched Endangered St Francis Dune Fynbos Thicket Mosaic Vegetation habitat which



contains a number of SSC (Impact rating of greater MEDIUM (-ve) significance.

Terrestrial Ecology Mitigation Measures:

The following should be implemented under the construction phase:

- It is recommended that a Botanical Specialist survey of the final development footprint be undertaken prior to commencement of construction works to identify any protected plants or trees in terms of all relevant legislation that may require a permit for destruction and/ or translocation;
- A permits in terms of Section 7 and 15 of the National Forest Act of 1998 must be obtained prior to commencement of construction;
- Construction footprints must be demarcated to minimise unnecessary clearing of vegetation and disturbance to soils;
- Sensitive vegetation that may be impacted by construction activities should be cordoned off prior to clearing and earthworks activities to restrict the movement of vehicles and potential disturbance to vegetation;
- Immediately prior (i.e. a few days before) to excavation, vegetation within the construction footprint should preferably be cleared by brush cutters / slashers to encourage any fauna and reptiles present to move out of the area;
- Excavation of trenches as well as clearing of vegetation to be conducted in a phased manner;
- Minimise cleared and disturbed areas by using already transformed areas where possible. An already transformed area should also be utilised for the contractor's site camp;
- All cleared vegetation (other than invasive aliens) should preferably be chipped and used as mulch;
- Rehabilitation of cleared areas with topsoil and indigenous vegetation as soon as construction is completed. Disturbed areas will be ripped and scarified in order to promote vegetation growth. A seed mix of indigenous vegetation species will be prepared for the rehabilitation of the site should natural vegetation not succeed;
- Use existing access roads and do not establish any new roads without authorisation;
- Harvesting or removal of any plant material is strictly prohibited – other than for search and rescue purposes (with permits in place) and for the authorised clearing of vegetation for construction;
- No fires are permitted on site;
- Smoking shall only be permitted in designated smoking areas in the site camp;
- A fire officer shall be appointed by the contractor who shall be responsible for co-ordinating rapid, appropriate responses in the event of a fire;
- Sufficient fire-fighting equipment shall be maintained and accessible on site at all times;
- Appoint an independent Environmental Control Officer (ECO) for the duration of the construction to monitor construction activities;
- Pipeline cross section widths and working spaces (i.e. construction footprints) must be identified and agreed upon in consultation with the ECO – working spaces must consider space required for:
 - Battering of trench slopes;
 - Storage of topsoil;

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- Storage of excavated material suitable for backfill/ unsuitable for backfill;
- Storage of bedding sand;
- Stringing of pipe along the trench before installation;
- Machinery and equipment along the trench before installation;
- Limitations where alignments cross environmentally sensitive areas; and
- Pipeline installation and reservoir establishment Method Statements must include environmental considerations and must be forwarded to the ECO for approval before construction.

The following should be implemented under the design phase:

- Ensure design plans specify construction footprints within servitudes which are to be adequately demarcated during the construction phase;
- It is recommended that vegetation within the future planned reservoir construction area be left intact until commencement of future construction activities; and
- The 2.5 ML Upper Seaview Reservoir must be accurately surveyed and marked prior to vegetation removal or commencement of construction. In addition, it is recommended that the fence line for the reservoir first be erected prior to establishment of the reservoir in order to contain construction activities and minimise the construction footprint.

The following mitigation measures were recommended by the Vegetation Specialist:

- The SSC noted in Table 3 of this report will require permits from the respective departments where appropriate;
- Certain species (such as trees and cosmopolitan species that are however protected by the legislation) are not necessarily suited to relocation and permits must be obtained before destruction; and
- The Vegetation Specialist recommended that any *Acrolophia capensis* and *Scadoxus puniceus* species (Protected by the Provincial Nature Conservation Ordinance of 1974) within any areas to be destroyed be translocated as they are suited to relocation. Dormant species including bulbs and species belonging to the Iridaceae were not observed but may be present within the proposed servitude. These should be relocated during the construction phase if necessary.

4c) Impacts on Fauna and Faunal Habitat

Clearance of vegetation and earthworks activities will have a direct impact on fauna and reptile habitats. Gathering of stormwater in open trenches during construction may also pose a risk to the livelihood of fauna. Clearing of large trees could result in destruction of animal and bird habitats. . Noise resulting from construction activities may furthermore displace and disturb local wildlife.

The significance rating for this impact is VERY LOW (-ve) without mitigation. If appropriate mitigation is



implemented, the impact could be reduced to be INSIGNIFICANT.

Options 1 versus Option 2 of 250 mm ø class 12 uPVC gravity main pipeline alignment:

Option 1 is preferred as it will have less of a disturbance impact on vegetation and faunal habitat. The significance rating for this impact was lower (i.e. LOW (-ve) reduced to INSIGNIFICANT with mitigation) than that of option 2 (i.e. MEDIUM (-ve) and remains MEDIUM as mitigation is not possible).

Mitigation Measures:

- Immediately prior (i.e. a few days before) to excavation, vegetation within the construction footprint should preferably be cleared by brush cutters / slashers to encourage any fauna and reptiles present to move out of the area;
- Any trees that are to be cut down should be checked by the ECO for any nests that could be impacted;
- Ends of trenches to be sloped to allow trapped animals to escape;
- Trenches to be checked by construction staff daily to assist any trapped animals;
- Where trenches pose a risk to animal safety, they should be adequately cordoned off to prevent animals falling in and getting trapped and/or injured. This can be prevented by excavating and backfilling trenches as construction progresses; and
- No faunal or reptile species are to be disturbed, trapped, hunted or killed.

5. Soil and Landscape Impacts

5a) Soil Erosion

The clearing of vegetation for proposed works will expose soils and increase the risk of soil erosion through wind and storm water run-off, particularly on slopes and potential embankment cuttings. Areas with steep sided slopes that will require adequate erosion control mitigation include the road reserve along the 200 mm uPVC Class 16 Gravity Main and the Upper Seaview Reservoir site.

Scouring and testing of the pipeline during commissioning may result in discharges that could also potentially result in soil erosion and contamination. However scour discharges should be small and will have minimal negative impact if appropriately mitigated.

The significance rating for this impact is LOW (-ve) without mitigation. If appropriate mitigation is implemented, the impact could be reduced to be INSIGNIFICANT.

5b) Soil Compaction

Construction vehicles are likely to compact soil in construction areas which may suppress plant growth if not appropriately rehabilitated.

The significance rating for this impact is LOW (-ve) without mitigation. If appropriate mitigation is implemented, the

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impact could be reduced to be INSIGNIFICANT.

5c) Soil Contamination

Soils could be contaminated by potential plant and equipment leaks and/ or spills or could be contaminated with subsoil (which cannot be used for rehabilitation).

The significance rating for this impact is VERY LOW (-ve) without mitigation. If appropriate mitigation is implemented, the impact could be reduced to be INSIGNIFICANT.

Mitigation Measures for Soil and Landscape Impacts:

- The construction process should be phased so as to limit the extent of exposed areas at any one time, and so that for any specific area, the time between initial disturbance and completion of construction is as short as possible;
- To minimise the risk of erosion, the extent of disturbed vegetation and soil should be kept to a minimum;
- Topsoil must be stripped from the proposed pipeline footprint and stockpiled (separately from subsoil) for further use in rehabilitation;
- Topsoil should only be exposed for minimal periods of time and adequately stockpiled (less than 2 m high) to prevent the topsoil loss and runoff. They should furthermore be protected against erosion of wind through covering or barricading;
- Use of potentially polluting and hazardous substances on site should be strictly controlled;
- Machinery and vehicles are to be removed from site for maintenance and repair. No repair / maintenance will be conducted on site;
- Plant and equipment must be checked regularly for potential leaks and ground / soil pollution (hydrocarbon spillages). Action must be taken as soon as spillages have been identified;
- Ensure the pipeline is aligned and constructed as to take into account any undermining activities. Any potential embankment cuttings must be appropriately stabilised and revegetated;
- Note that authorisation from the Department of Mineral Resources is required for the establishment of borrow pits should material be required for the establishment of the Upper Seaview Reservoir access road or any potential maintenance works;
- Cut and fill to be avoided as far as reasonably practical; and
- Erosion due to work undertaken on steep slopes must be avoided through the implementation of appropriate erosion control measures.

6. Drainage and Stormwater Management

Construction activities within the road reserve could potentially change the profile of road verges and/ or negatively impact stormwater channels which may result in stormwater ponding and/ or exacerbate erosion. Both the Seaview



350 mm diameter Gravity Main and 315 mm diameter Rising Main crosses a drainage line at the same point (see Hydrology Map attached to Appendix A) where an impact to the current drainage is possible due to excavation and fill activities (25°21'51.8"E ; 33°59'46"S).

The significance rating for this impact is LOW (-ve) without mitigation. If appropriate mitigation is implemented, the impact could be reduced to be INSIGNIFICANT.

The following mitigation measures should be undertaken during the design phase:

- Scour chambers must be designed to prevent scour damage and erosion where raw water is to be discharged; and
- Design measures must accommodate pipeline watercourse crossings as during flooding events, pipelines can be exposed to damage. Appropriate stormwater design and mitigation measures must be implemented at these points (i.e. crossing at the Seaview 350 mm Gravity Main and 315 mm Rising Main) and any other watercourse crossings along proposed alignments.

Construction Mitigation Measures:

- Correct drainage measures must be installed and disturbed areas must be suitably levelled following installation of the pipelines and associated ancillaries;
- Natural and artificial drainage gradients must be reinstated;
- Stockpiling will only be done in areas that will not interfere with the natural drainage paths of the environment;
- Steep areas may require berms and temporary drainage diversion;
- Appropriate dewatering measures must be in place and discharge from any pumps shall be disposed of in accordance with the instructions given by the ECO; and
- Installation of permanent drainage measures and rehabilitation of disturbed areas must be implemented as early as possible.

7. Aquatic Impacts and Surface Water

Possible impacts that the construction of the proposed pipeline alignments may have on the identified wetlands include:

- 7a) Destruction of wetland habitat.
- 7b) Sedimentation into wetlands; and
- 7c) Pollution into wetlands and potential to affect water quality.

Wetlands 4 and 9 were rated by the Aquatic Specialist to have the highest impact ratings associated with each aquatic impact listed above and as such have been mentioned below (Refer to the Aquatic Impact Assessment attached to Appendix D4). **However it is noted that from an ecological perspective, both these wetlands are**

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regarded as not important and they do not have any conservation value. Furthermore, the results of the Aquatic Impact Assessment showed that the impact significance of the above listed impacts on all other identified aquatic systems resulting from the proposed pipeline alignments are mostly **very low** or **insignificant** with and without mitigation.

Options 1 versus Option 2 of 250 mm ø class 12 uPVC gravity main pipeline alignment:

From an ecological perspective Option 1 is preferred, as it runs within the existing servitude along Seaview Rd and then along an existing pipeline servitude to Beach view. Option 2 runs through natural bush and this is ecologically less preferable.

7a) Destruction of wetland habitat during construction

Construction clearing activities and earth works could potentially have an impact on instream/ riparian vegetation of potential wetlands in close proximity. Destruction of wetland habitat during construction on both wetlands 4 and 9 were rated by the Aquatic Specialist to be LOW (-ve) without mitigation and INSIGNIFICANT with mitigation as the proposed pipelines will transect and disturb these wetlands. However, from an ecological perspective, this wetland is regarded as not important and it does not have any conservation value.

7b) Sedimentation into wetlands during construction

During the construction phase when vegetation is cleared, large quantities of loose earth may easily be washed from the construction area and be transported downstream during high rainfall events, resulting in increased sedimentation of aquatic systems occurring downstream. This would impact on vegetation and biota of these systems, but could also influence the geomorphology and overall functioning, in severe circumstances, of downstream watercourses and wetlands. According to the Aquatic Specialist, the impact significance of sedimentation to Wetland 4 during construction is considered to be LOW (-ve). But with mitigation it is considered to be INSIGNIFICANT. Impact significance of sedimentation to Wetland 9 during operation is also LOW (-ve). But with mitigation it is considered to be VERY LOW (-ve).

7c) Pollution into wetlands and potential to affect water quality during construction

Construction activities could cause contamination of watercourses on site and downstream if proper management is not practiced. Accidental spills of hydrocarbons (oils, diesel, etc.) or leakage of such substances from construction machinery may enter the watercourse directly, through surface runoff during rainfall events or subsurface movement (through groundwater) and then migrate to downstream systems. Such chemicals, fuels or pollutants would alter the water quality within the systems, having an effect on ecology in the form of biodiversity loss, i.e. the loss of vegetation and aquatic fauna that are sensitive to changes in water quality (especially from toxicant inputs). Ablution facilities that are not properly maintained during the construction phase may also result in pollution of ground and surface water. Solid waste in the form of general litter left by labourers such as construction materials (gloves, excess materials, cement, etc.) as well as domestic litter (plastic and styrofoam) can also affect the aquatic



systems in close proximity and downstream if waste is not appropriately managed and disposed of. This can establish a barrier to water movement and may also alter the quality of water within the resource negatively. According to the Aquatic Specialist, the impact significance of pollution to Wetland 4 during construction is VERY LOW (-ve). But with mitigation it is considered to be INSIGNIFICANT. Impact significance of pollution to Wetland 9 during operation is LOW (-ve). But with mitigation it is considered to be VERY LOW (-ve).

The following mitigation measures were recommended by the Aquatic Specialist:

- Preventing wet conditions to develop on the road reserve in the case of Wetlands 4 and 9. Drainage systems should allow water to flow through a pipe, under the road. This will prevent damming and the enhanced wetland conditions on the road reserve will disappear;
- Care should be taken to ensure that the construction does not create new depressions where water can accumulate;
- Proper drainage and management of stormwater is necessary to avoid undesirable accumulation of rainwater and erosion;
- Avoid erosion at all times to avoid sedimentation or pollution of nearby wetlands or drainage lines. Erosion control measures should form part of the planning as well as the construction and implementation phases of the development. A rehabilitation plan should be put into place that will address any erosion of the general area;
- Control waste dumping and avoid pollution at all times; and
- Re-vegetating of cleared areas with suitable indigenous species as soon as possible after the disturbance, together with an alien species monitoring and eradication program during the liability period should prevent encroachment of alien species.

Mitigation Measures recommended by the Environmental Assessment Practitioner:

- No stockpiling should take place within a water course;
- All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds;
- Stockpiles must be located away from river channels;
- Construction activities must be limited to the pipeline servitude. No vehicles may move across any watercourse or wetland area;
- Wetlands and watercourses (go and no-go areas) will be demarcated and no activity will be allowed within no-go areas, unless otherwise approved by the ECO;
- Authorisation must be obtained from the Department of Water and Sanitation for the WULA's for the wetlands identified by the Aquatic Specialist;
- The construction site camp should not be sited within 50 m of any wetland or watercourse and preferably further away if possible;
- The proper storage and handling of hazardous substances (hydrocarbons and chemicals) needs to be

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administered;

- Operation, storage and maintenance of machinery and construction-related equipment in close proximity to wetlands must be limited as far as possible;
- Appropriate solid waste disposal facilities must be provided on-site during construction and adequate signage be provided;
- Spillages should be cleaned up immediately and contaminants properly drained and disposed of using appropriate waste facilities (not to be disposed of within the natural environment). Any contaminated soil from the construction site must be removed and disposed of appropriately;
- Any cement batching activities should occur outside of the delineated wetland boundaries and conducted on an impermeable surface. Cement products/ wash may not be disposed of into the natural environment;
- Drip-trays must be provided beneath standing vehicles and machinery, and routine checks should be done to ensure that these are in a good condition;
- Portable toilets must be provided where construction is occurring. Workers need to be encouraged to use these facilities and not the natural environment;
- All general waste, construction plant equipment, surplus rock, and other foreign materials must be completely removed from site once construction has been completed;
- Any erosion gullies/ channels created during construction should be filled immediately to ensure silt does not drain into the wetland; and
- Should sedimentation and erosion of the pipeline servitude/ construction site prove to be significant, erosion berms in the pipeline servitude are recommended to be installed and/ or sediment barriers (e.g. silt fences, sandbags or hay bales) immediately downstream of active work areas (particularly on channel banks) as necessary, to trap any excessive sediments generated during construction.

8. Traffic Safety

Equipment, materials and possible abnormal loads will need to be transported to site using existing provincial roads which may result in traffic congestion and disruptions. The provincial road expected to be the most affected is the Seaview Road, where plant will need to turn off to access the proposed pipeline alignments and reservoirs (e.g. the turnoff point for the access road to the proposed Upper Seaview Reservoir). There is also a possibility for temporary blocking off of section of one lane in certain areas due to construction vehicles and activities occurring within the road reserve which may extend slightly into the road. This will therefore present a temporary safety risk for vehicles travelling on the Seaview Road. Temporary detour roads are proposed to accommodate vehicles and pedestrians where necessary.

The significance rating for this impact is LOW (-ve) without mitigation. If appropriate mitigation is implemented, the impact could be reduced to be VERY LOW.

Mitigation Measures:

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- Ensure that there are flag men in place on the Seaview Road at access points to construction work fronts;
- Contractor must identify optimal ways to minimize disruptions and interruptions to traffic;
- Existing roads must be utilised as far as reasonably practical;
- Use appropriate road signage, in accordance with the South African Traffic Safety Manual, providing flagmen, barriers etc. at the various access points, when necessary;
- Establish speed limits (not more than 40km per hour) for all construction related traffic;
- Ensure that heavy construction vehicles are suitably marked to be visible to other road users and pedestrians;
- No unnecessary driving over verges and/or private property;
- Appropriate traffic warning signage to be in place; and
- It is recommended that abnormal loads and vehicles transporting materials to site avoid peak traffic hours.

9. Socio-Economic Impacts

Positive Impacts:

9 a) Job Creation and Skills Development

There would be a positive socio-economic impact as a number of short term jobs (i.e. 45) will be created during the construction phase. This will result in skills development for semi-skilled and unskilled workers.

The significance rating for this impact is LOW (+ve) without mitigation. Even with mitigation, the significance of the impact remains LOW.

Mitigation Measures:

- Maximise opportunities for the training of unskilled workers from local communities and use local sub-contractors, where possible;
- Increase employment opportunities (e.g. secondary service provision of food, toilet hires, and equipment etc.); and
- Source construction materials from local sources and suppliers, where possible.

Negative impacts

9 b) Damage and/ or Interruption of Services

Construction activities (mainly excavations for pipeline installation) may impact existing infrastructure along servitudes and pipeline alignments. This includes damage and interference to existing:

- pipelines – e.g. Photo 17;
- powerlines – e.g. Photo 15 and Photo 34;
- telephone lines – e.g. Photo 19;
- provincial road crossings (e.g. Wyndomayne Road – Photo 12, N2 off ramp to Seaview Road – Photo 6,

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N2 on ramp from Seaview Road and potentially the N2 on and off ramps from the Seaview Road);

- stormwater infrastructures (e.g. culverts and side drains – i.e. Erf 486, Erf 62/10 and Erf 80/10 – Photo 18);
- private property of adjacent landowners (e.g. driveways, gardens, gates, fences) (particularly on the Greenbushes pipeline alignment).

The significance rating for this impact is LOW (-ve) without mitigation. If appropriate mitigation is implemented, the impact could be reduced to INSIGNIFICANT.

Pipelines will however be laid under provincial roads via directional drilling in order to limit disturbance to road infrastructure and avoid traffic disruptions to road users.

Design Mitigation Measures:

- Identify and demarcate existing utilities and in-situ services prior to construction;
- Ensure that routing of the pipelines prevent the disruption of services as far as possible and that effective communication is maintained with utility providers to avoid and minimize interruptions of services during pre-construction and construction; and
- Ensure Eskom is appropriate to agree upon appropriate safety clearance distances when working under powerlines and potential need for temporary disconnection of powerlines.

Construction Mitigation Measures:

- Should any damage to existing infrastructure or private property occur, the relevant service provider/ landowners should be contacted and appropriate repairs/ replacements commissioned to the satisfaction of the service provider /landowner.

9c) Landowner issues and private property

Pipeline construction activities may inconvenience landowners, particularly those whose driveways may be intersected by the proposed pipeline alignments.

The significance rating for this impact is LOW (-ve) without mitigation. If appropriate mitigation is implemented, the impact could be reduced to INSIGNIFICANT.

Mitigation Measures:

- Notice (in advance) to be given to all neighbours whose property will be affected by pipeline crossings; and
- Contractors to establish landings over private property driveways.



Indirect Impacts:

Impacts on Terrestrial Ecology

4d) Spread of Invasive Alien Plants

Some sections of the road reserve are characterised by a number of alien invasive plant species (e.g. Eucalyptus, Pine, Rooikrans, Long-leaved Wattle, Black Wattle, Port Jackson willow and American nightshade – Photo's 20, 21 and 22) and are therefore more susceptible to the establishment and spread of invasive plant species. Without mitigation, construction activities, particularly the disturbance of soils, will exacerbate the risk of seed germination, and spread and colonisation by these plants which could ultimately have an impact on plant species composition and biodiversity.

The significance rating for this impact is MEDIUM (-ve) without mitigation. If appropriate mitigation is implemented, the impact could be reduced to VERY LOW.

Mitigation Measures:

- Cleared invasive alien plants must be removed and disposed of at the landfill and proof retained for auditing purposes;
- Remove all invasive alien plants from disturbed areas before they reach seed-bearing age. This needs to occur on a regular basis (at least monthly) until the end of the contractor's liability period; and
- CARA listed species require removal as per Conservation of Agricultural Resources Act and a management plan should be incorporated into the EMP to retain the servitude invasive free.

Cumulative:

Socio-Economic Impacts

9 d) Deterioration of existing roads

The increase in heavy construction vehicles and equipment and potential abnormal loads may lead to excessive wear and tear of existing provincial roads, particularly the Seaview Road.

The significance rating for this impact is LOW (-ve) without mitigation. If appropriate mitigation is implemented, the impact could be reduced to be VERY LOW.

Mitigation Measures:

- Ensure that vehicle axle loads do not exceed the technical design capacity of provincial roads;
- Establish speed limits (not more than 40km per hour) for all construction related traffic;
- Ensure that construction vehicle tyres are inflated according to the manufacturer's specifications for optimum load/inflation pressure; and

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- No indiscriminate driving will be allowed by construction vehicles.

No-go alternative:

This alternative would result in the demand for bulk potable water exceeding the supply. This would involve the continuation of the status quo, i.e. continued water shortages. The benefits experienced through employment opportunities and stimulation of the local and regional economy would also not occur and water provision programmes for the two existing informal settlements adjacent to the Seaview Pump Station would not be undertaken. Existing road reserves and environments would remain as is.

Operational Phase

Direct impacts:

1. Loss of water from the potential wear and tear of pipes and reservoirs if not regularly maintained

Leaks or bursts in the pipeline, or failure of the reservoirs, are unlikely risks if the infrastructure is designed and built properly. However, these incidents would have the potential to cause damage to road infrastructure and adjacent land.

The significance rating for this impact is LOW (-ve) without mitigation. If appropriate mitigation is implemented, the impact could be reduced to INSIGNIFICANT.

Mitigation Measures:

- Pipelines and reservoirs should be regularly inspected for any possible damage or corrosion to prevent water leakages. Any damaged pipes should be immediately replaced; and
- Any maintenance activities required must be carried out in accordance with the construction mitigation measures as listed above (Construction Phase).

2. Safety issues due to potential inadequate servitude maintenance

Overgrown pipeline maintenance servitudes or alternatively over-use of service roads could result in safety concerns for vehicles accessing the pipeline or erosion and undermining of roads if not properly maintained.

The significance rating for this impact is VERY LOW (-ve) without mitigation. If appropriate mitigation is implemented, the impact could be reduced to be INSIGNIFICANT.

Mitigation Measures:

- According to the Engineer's design report, a complete operation and maintenance manual with a training

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programme will be supplied in duplicate by the Engineer to the Nelson Mandela Bay Municipality on commissioning of the project. Nelson Mandela Bay Municipality will be responsible for the operation and maintenance of the proposed infrastructure. The NMBM must ensure that access road servitudes are appropriately maintained;

- Any maintenance activities required must be carried out in accordance with the construction mitigation measures as listed above (Construction Phase).

3. Improved water supply/ security

The proposed development aims to expand current bulk water supply infrastructure in order to address the future provision of potable water to the Seaview and Greenbushes supply areas. Water supply will be improved and secured within Supply Zones 1, 2, 4 & 5 for the Seaview Area and Supply Zone 7 for the Greenbushes Area. Formal water supply will also be provided to the two existing informal settlement adjacent to the existing seaview pump station complex. The expansion to current bulk water supply infrastructure in the Seaview and Greenbushes supply areas will furthermore:

- Eliminate individual supplies off of existing rising mains and bulk supply mains;
- Improve supply zone delineation;
- Provide adequate storage for each supply zone;
- Eliminate existing brick and steel water retaining structures; and
- Allow for the pump station to operate unmanned and to be linked to the existing telemetry system.

The significance rating for this impact is HIGH (+ve) without mitigation. No improvement mitigation has been proposed and the significance of this impact therefore remains as HIGH.

4. Potential Visual Impacts

Potential visual impact of the proposed 2.5 ML Upper Seaview Reservoir from the Seaview Road if it is not adequately designed or positioned in relation to the landscape. The proposed reservoir site is hidden within the forest (large trees) which will act as a natural visual barrier if forest is not unnecessarily cleared during construction.

The significance rating for this impact is VERY LOW (-ve) without mitigation. Even with mitigation, the significance of this impact remains VERY LOW.

Mitigation Measures:

The following should be implemented under the design phase:

- The proposed 2.5 ML Upper Seaview Reservoir must be designed and positioned in such a way to minimise its visual appearance from the Seaview Road. The engineering design should be based on site topography and adjacent vegetation;
- Avoid use of intrusive lighting; and

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- Avoid unnecessary clearing of forest which naturally acts as a visual barrier.

5. Aquatic Impacts and Surface Water

5 a) Sedimentation into wetlands during operation

Sedimentation of wetlands during operation can occur should soil become exposed in areas due to inadequate rehabilitation measures or erosion. According to the Aquatic Specialist, the impact significance of sedimentation to Wetland 4 during operation is low. But with mitigation it is considered to be insignificant. Impact significance of sedimentation to Wetland 9 during operation is low. But with mitigation it is considered to be very low.

Mitigation measures recommended by SRK:

- Any erosion gullies/ channels that occur during operation must be filled, stabilised and revegetated as soon as possible as part of maintenance procedures. Also, disturbed and bare ground surfaces should be rehabilitated with suitable indigenous vegetation to stabilise soils.

5b) Potential wetland hydrology alteration

The construction of infrastructure services and roads in watercourses could potentially influence the natural hydrology of the system if designs do not allow for flows to be similar to the pre-development scenario which could potentially have an impact on the water quality of wetlands during operation. According to the Aquatic Specialist, the impact significance of pollution to Wetland 4 during operation is VERY LOW (-ve). But with mitigation it is considered to be INSIGNIFICANT. Impact significance of pollution to Wetland 9 during operation is LOW. But with mitigation it is considered to be VERY LOW.

Mitigation measures recommended by SRK:

- Ensure that the natural hydrology and stormwater flows are maintained.

Indirect impacts:

6. **Potential Socio-economic Impacts:**

There is a potential for local job creation for pipeline and access road maintenance works during the operational phase of the project.

The significance rating for this impact is LOW (+ve) without mitigation. If appropriate mitigation is implemented, the significance of this impact could be improved to MEDIUM.

Mitigation Measures:

- During pipeline routine maintenance and repair work, the Municipality should use the services of local contractors based on the Expanded Public Works Programme and NMBM Exempted Micro-Enterprises Supply

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Chain requirements.
Cumulative impacts:
None
No-go alternative:
<p>If the proposed bulk water supply project is not implemented, Supply Zones 1, 2, 4 & 5 for the Seaview Area and Supply Zone 7 for the Greenbushes Area will face water supply challenges.</p> <p>The significance rating for this impact is HIGH (-ve) should the project not go ahead. This would involve the continuation of the status quo, i.e. continued water shortages. The benefits experienced through employment opportunities and stimulation of the local and regional economy would also not occur.</p>

Decommissioning Phase
<p>The life expectancy of the new infrastructure is approximately 50 years. It is however unlikely that the pipelines will be decommissioned. However, should the pipeline be decommissioned, a Decommissioning Plan must be prepared and implemented, to mitigate and manage potential negative impacts on the biophysical and socio-economic environments.</p>
Direct impacts:
None

3. 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.

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IMPACT	CONSTRUCTION				OPERATION		NO-GO OPTION
	WITHOUT MITIGATION		WITH MITIGATION		WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION
1a. Solid Waste Management	Very Low	-ve	Insignificant	-ve			
1b. Sewage Management	Very Low	-ve	Insignificant	-ve			
1c. Hazardous Substances and Waste Management	Very Low	-ve	Insignificant	-ve			
2a. Noise Impacts	Very Low	-ve	Very Low	-ve			
2b. Impacts on Air Quality	Very Low	-ve	Insignificant	-ve			
3a. Impacts on Archaeological Heritage	Low	-ve	Very Low	-ve			
3b. Heritage Historical Impacts	Not rated		Not rated				
3c. Impacts on Palaeontological Heritage	Low	-ve	Very Low	-ve			
4a. Loss of Vegetation and Habitat	Low	-ve	Low	-ve			
Option 1	Low	-ve	Insignificant	-ve			
Option 2	Medium	-ve	Medium	-ve			
4b. Impact on Local Biodiversity and Loss of Plant SSC and Protected Tree's	Medium	-ve	Low	-ve			
Option 1	Low	-ve	Insignificant	-ve			
Option 2	Medium	-ve	Medium	-ve			
4c. Impacts on Fauna and Faunal Habitat	Very Low	-ve	Insignificant	-ve			
Option 1	Low	-ve	Insignificant	-ve			
Option 2	Medium	-ve	Medium	-ve			
4d. Spread of Invasive Alien Plants	Medium	-ve	Very Low	-ve			
5a. Soil Erosion	Low	-ve	Insignificant	-ve			
5b. Soil compaction	Low	-ve	Insignificant	-ve			
5c. Soil contamination	Very Low	-ve	Insignificant	-ve			
6. Drainage and Stormwater Management	Low	-ve	Insignificant	-ve			

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7a. Destruction of wetland habitat	Low	-ve	Insignificant	-ve		
Option 1	Very low	-ve	Insignificant	-ve		
Option 2	Very low	-ve	Insignificant	-ve		
7b. Sedimentation into wetlands	Very Low	-ve	Insignificant	-ve		
7c. Pollution into wetlands and potential to affect water quality	Very Low	-ve	Insignificant	-ve		
8. Traffic Safety	Low	-ve	Very Low	-ve		
9a. Job Creation and Skills Development	Low	+ve	Low	+ve		
9b. Damage and/or Interruption of Services	Low	-ve	Insignificant	-ve		
9c. Landowner Issues	Low	-ve	Insignificant	-ve		
9d. Deterioration of existing roads	Low	-ve	Very Low	-ve		
1. Loss of water			Low	-ve	Insignificant	-ve
2. Safety Issues related to inadequate servitude maintenance			Very Low	-ve	Insignificant	-ve
3. Improved Water Supply Security			High	+ve	High	+ve
4. Potential Visual Impacts			Very Low	-ve	Very Low	-ve
5a. Sedimentation into wetlands			Low	-ve	Very Low	-ve
5b. Potential wetland hydrology alteration			Low	-ve	Very Low	-ve
6. Local Job creation			Low	-ve	Medium	-ve
					High	-ve

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Assumptions and Limitations of the Study

The following assumptions were made by SRK Consulting:

- It is assumed that all the recommendations listed in this report and the Draft Environmental Management Programme will be carried out by the respective parties.

The following assumptions were extracted from the Aquatic Impact Assessment Report:

Access to the two artificial Aquatic Systems (Dams) at Tembani Lodge, within 500 m of the proposed development was not possible, however they could at least be adequately observed from nearby property boundary fences. As these two aquatic systems are located about 500 m from the proposed alignment of the pipeline, further investigation of these two systems was not regarded necessary. The presence of 22 wetlands / aquatic systems within the 500 m buffer from the proposed pipeline alignment implies that a Water Use Licence will be needed.

Impact Statement

Alternative A (preferred alternative)

Terrestrial Ecology Impacts 4b (Loss of Plant SSC and Protected Tree's) and 4d (i.e. Spread of Invasive Alien Plants) were rated to be of the highest negative impact significance (i.e. Medium) of all impacts applicable to the Construction Phase of proposed bulk water infrastructure expansion. Other than these impacts, the majority of negative impacts assessed for the Construction Phase are considered to be of LOW or VERY LOW significance and can further be reduced to VERY LOW or INSIGNIFICANT with mitigation. Impact 9a (i.e. Job Creation and Skills Development) was the only positive impact applicable to the Construction Phase and was rated to be of LOW significance with mitigation.

The most significant positive impacts associated with the Operational Phase of the proposed bulk water infrastructure expansion include Impact 3 (i.e. Improved Water Supply Security) rated to be of HIGH significance, as well as Impact 6 (i.e. Local Job Creation) rated to be of MEDIUM significance following mitigation. All other impacts were considered to be negative and of LOW or VERY LOW significance and can be reduced to VERY LOW or INSIGNIFICANT with mitigation.

Maps indicating the proposed bulk water infrastructure expansion and potential environmental sensitivities in the surrounding area are included in Appendix A.

It is noted that SRK's recommendation to move the upper part of this alignment to the southern side of the Seaview Road (to avoid the northern steep sided embankment) has been accepted by the Engineer. Design plans will therefore be amended accordingly.

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Options 1 versus Option 2 of 250 mm ø class 12 uPVC gravity main pipeline alignment:

A comparative assessment of Option 1 versus Option 2 of the 250 mm ø class 12 uPVC gravity main pipeline alignment was made and the following results were concluded applicable to the Construction Phase of the proposed bulk water expansion:

Terrestrial Impacts (4a and 4b)

Option 1 is preferred as it will have less of a disturbance impact on vegetation and habitat (impact rating of LOW (-ve) significance which can be reduced to INSIGNIFICANT with mitigation). Option 2 will require the clearing of a new servitude through untouched Endangered St Francis Dune Fynbos Thicket Mosaic Vegetation which contains a number of SSC (Impact rating of greater MEDIUM (-ve) significance which remains MEDIUM and mitigation is not possible).

Terrestrial Impact (4c)

Option 1 is preferred as it will have less of a disturbance impact on vegetation and faunal habitat. The significance rating for this impact was lower (i.e. LOW (-ve) reduced to INSGINIFICANT with mitigation) than that of option 2 (i.e. MEDIUM significance, mitigation not possible).

Aquatic Impacts and Surface Water (7a-7c)

From an ecological perspective Option 1 is preferred, as it runs within the existing servitude along Seaview Road. Other than a potential drainage line that crosses this proposed alignment, no wetlands occur within 500 m of this alignment. Option 2 runs through natural bush that is ecologically sensitive. Two wet areas not classified as wetlands were observed within 500 m of this alignment. Option 2 is therefore considered to be less preferable even though the significance rating is similar (i.e. both options have significance ratings of for all aquatic impacts of VERY LOW (-ve) significance reduced to INSIGNIFICANT with mitigation).

No-go alternative (compulsory)

The no-go alternative is rated to be of HIGH (-ve) impact significance and would involve the continuation of the status que i.e. the demand for bulk potable water will continue to exceed supply and water insecurity and shortages will persist. The benefits experienced through employment opportunities and stimulation of the local and regional economy would also not occur and water provision programmes for the two existing informal settlements adjacent to the Seaview Pump Station would not be undertaken. Existing road reserves and environments would remain as is.



SECTION E. RECOMMENDATIONS 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	[Redacted]
YES	

Is an EMPr attached?

The EMPr must be attached as Appendix F.

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

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:

A project specific Environmental Management Programme (EMPr) has been compiled and can be found under Appendix F of this document.

It is recommended that an Environmental Control Officer be appointed to conduct independent audits to ensure compliance with the EMPr during construction.



SECTION F: APPENDICES

The following appendixes must be attached as appropriate:

Appendix A: Site plan(s)

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports

Appendix D1: Archaeology Impact Assessment

Appendix D2: Palaeontology Desktop Study

Appendix D3: Vegetation Study

Appendix D4: Aquatic Impact Assessment

Appendix E: Public Participation Process

Appendix E1: Public Participation Summary

Appendix E2: Poster & Newspaper Notice

Appendix E3: BID

Appendix E4: BID Delivery Receipts

Appendix E5: Pre-Application DBAR Delivery Receipts

Appendix E6: Comments and Responses Tables

Appendix E7: IAP Register

Appendix E8: IAP Correspondence on BID

Appendix E9: IAP Correspondence on Pre-Application DBAR

Appendix F: Draft Environmental Management Programme (Draft EMPr)

Appendix G: Other information

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Appendix G1: List of Coordinates

Appendix G2: Previous RoD and DAFF Licence

Appendix H: Impact Rating Methodology and Rating Sheet

Appendix I: Curriculum Vitae of EAP

Appendix J: Application Form & DEDEAT Correspondence

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