



# **BASIC ASSESSMENT FOR THE PROPOSED EXPANSION OF WATERVAL WASTE WATER TREATMENT WORKS, MIDVAAL LOCAL MUNICIPALITY, GAUTENG PROVINCE.**

## **DRAFT BASIC ASSESSMENT REPORT**

**February 2014**

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**This report has been issued for public review as of 21 February 2014 to 25 March 2014**



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## environmental affairs

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA

(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.

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### 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, 2010 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. This report format is current as of **1 September 2012**. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
3. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
4. Where applicable **tick** the boxes that are applicable in the report.
5. An incomplete report may be returned to the applicant for revision.
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7. This report must be handed in at offices of the relevant competent authority as determined by each authority.
8. No faxed or e-mailed reports will be accepted.
9. The signature of the EAP on the report must be an original signature.
10. The report must be compiled by an independent environmental assessment practitioner.
11. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
12. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
13. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.

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

**SECTION A: ACTIVITY INFORMATION**

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

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

**1. Project Description**

**a) Describe the project associated with the listed activities applied for**

**1.1 Background Information**

ERWAT proposes to increase the capacity of the Waterval Wastewater Treatment Works from 155ML/day to 255ML/day through the construction of Module 5. ERWAT proposes to increase the treatment capacity of their existing Waste Water Treatment Works (Waterval Works hereafter) by increasing the treatment capacity by 100ML. The existing capacity of the Waterval Works is 155ML/day. The proposed capacity will be increased by 100ML/day, to a total of 255ML/day. The proposed development falls within the boundaries of Midvaal Local Municipality, Gauteng.

The proposed development site is located on Farm Waterval, Portion 150 IR and is situated adjacent to R59 (Vereeniging Road), and on the confluence of Rietspruit and Kliprivier near the Garthdale Agricultural Holdings, Gauteng. The Waterval Works is situated approximately 26 km south east of Johannesburg, 10km south west of the town of Katlehong and is accessible off the R59 at central coordinates 26°26'14.87"S and 28° 5'52.37"E. Access to the site is via the R59, Sybrand Van Niekerk Freeway, where one off ramps onto Vereeniging Road in an easterly direction.

The Waterval Works serves parts of Alberton, Boksburg, Germiston, Brakpan, Benoni and Springs, which are all part of the Ekurhuleni Metropolitan Municipality. Although the Waterval works are situated within the Midvaal Local Municipality, it is however still managed by Ekurhuleni Metropolitan Municipality.

The above-mentioned project forms part of the Municipalities strategies to improve the quality of treated effluent to meet the recently amended effluent quality standards and is also an initiative to improve the efficiency of the Works. The Department of Water Affairs (DWA) requires that all wastewater treatment Works meet the "2010 standard" so that it is equipped to deal with effluent quantity and quality predicted for this period.

No alternatives were considered for the project as the project will occur in within the existing Waterval Works boundary. This Basic Assessment Report (BAR) covers the findings of the site assessment and impacts identified within and the immediate surroundings of the Waterval Works.

**1.2 Project Description**

The capacity of the Waterval will be increased from 155 Ml/day to 255 Ml/day through the construction of a new module which include screening, de-gritting, primary sedimentation, reactors, fermentation of raw sludge, final clarification, chlorination, waste sludge thickening and dewatering. The upgrades and extensions have been proposed as follows:

- a) Inlet Works modifications
- b) Primary settling  
This will include the construction of four ( 4 x ) primary settling tanks of 36 m diameter and 9,7 m deep (sloping bottom tanks) and four (4x) sludge recycle pump station.
- c) Biological treatment  
Infrastructure associated with the biological treatment will include the construction of two (2) biological reactors of about 137, 2 m x 48, 1 m x 5,32m deep.
- d) Secondary settling

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About four 4 x secondary settling tanks of about 36 m diameter and 9, 7 m deep (sloping bottom tanks) will be constructed as part of the Works upgrade and expansion.

e) Chlorination

This will include the modifications to existing module 4 Chlorine contact tank. The modification of the Sludge handling facility will involve the modifications to existing module 4 reactors

The proposed Module 5 will be similar to the existing Module 4 which will also make use of biological nutrient removal activated sludge technology. The raw sewage will enter the Works at the existing head of works and then will split to the existing four modules and the proposed module. The raw sewage will enter the head of the works and then flows into the mechanically mixed equalisation tanks. From the equalisation tanks, the sewage will flow to a primary sedimentation tank. The primary sedimentation tank will be based on the configuration whereby primary settled sludge is recycled to the primary sedimentation tanks. Acid fermentation for acetate will be produced to enhance biological phosphate removal. The settled sewage will then flow into the biological nutrient removal activated sludge reactors that will incorporate anaerobic, anoxic and aerobic zones in a basic three stage configuration. The final clarified effluent will be chlorinated and flow to the existing chlorine tank and then to the existing maturation ponds. The Waste Activated sludge will be thickened in the dissolved air flotation (DAF) followed by anaerobic digester.

The proposed site for the location of Module 5 is located on the south western side of the existing Waterval Works and occupies an approximate area of 19.5 ha. However a site of about 45000m<sup>2</sup> (300m x 150m) is required to accommodate the proposed module 5. The site is transformed and was noted to have been cleared from all indigenous vegetation. Evidence of alien plant assemblages and bare ground in some areas was observed.

(Please refer to **Figure 1** for project location and Site photographs contained in **Appendix B** for an overall view of the site. The layout of the proposed expansion and the associated activities layout are attached as **Appendix C**.

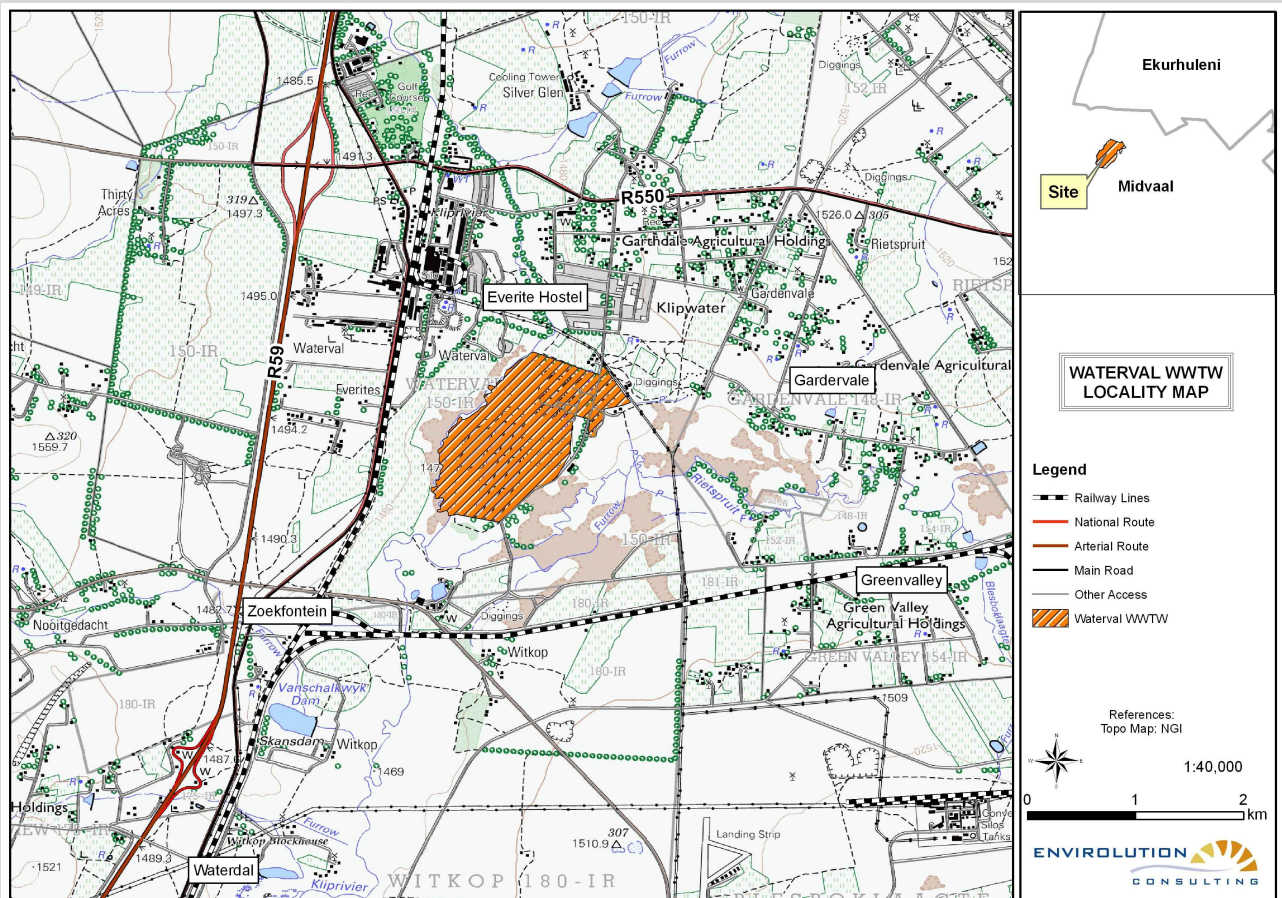


Figure 1: Map showing location of the Waterval Wastewater Treatment Works



### 1.3 Project Locality

The site of the proposed project is located in the province of Gauteng and is approximately 15km north east of Meyerton and 2km south of Garthdale. The study area falls in Quarter Degree Grid Cell (QDGC) 2628AC between 26°26'22.07" - 28°05'50.79" south and 26°26'27.55 - 28°05'49.63".

The area is characterised by predominantly mid-summer rainfall, receiving mean annual precipitation of 570mm to 730mm. Mean annual temperatures range from 12°C to 20°C, with mean daily maximum temperatures in February ranging from 20°C to 32°C, and mean daily minimum temperatures in July ranging from -2°C to 4°C (Kenyans et al., 2007).

The study area is located within Downstream Vaal Dam sub water management area of the Upper Vaal Management Area (WMA) in the Quaternary Catchment C22C at the confluence of the Klip River and the Rietspruit. The study area falls within the Rietspruit (C22C) Quaternary Catchment. Two perennial rivers, Rietspruit and Klip River drain the site in different directions. Several dams and furrows are located in and around the project area. These are used by the agricultural holdings in the area.

In terms of Regional vegetation, the study site is located in the Grassland biome (Mucina & Rutherford, 2006), within the Mesic Highveld Grassland bioregion. The grassland biome occupies 29% of the land within South Africa's borders. It supports a rich diversity of flora and fauna, however, it is critically threatened as 30% of the biome has been permanently transformed and only 2.8% is formally conserved. According to the C-Plan, due to the historically transformed state of the study area, this area is not prioritized for conservation. The study area was very small in size (300m x 150m) and consisted of transformed (modified) habitat

### 1.4 Existing Waste Water Treatment Works Infrastructure and Treatment Process

This existing operations and infrastructure at Waterval WWTW is a modular Biological Nutrient Reactor system consisting of 4 modules with a total handling capacity of 155ML/day as follows:

Module	Capacity (ML/day)
Module 1	35
Module 2	35
Module 3	35
Module 4	50
Module 5 (Proposed activity)	100

The Waterval works basically consist of the Inlet works, Screening and degritting, Emergency Ponds, Primary Settling Tanks (PSTs), Gravity Thickeners, Dissolve Air Flootation units (DAF), Anaerobic Digesters, Sludge Lagoons, Biological Reactors, Secondary Settling Tanks (SSTs), Disinfection and Maturation ponds. The waste treatment processed are described in details in the sections below:

#### 1.4.1 The Inlet Works

The raw wastewater arrives at the works via the existing Alberton and Germiston outfall sewers following the Klip River and Rietspruit valleys respectively and combines immediately. The streams are then divided upstream into Modules 1 – 3 and Module 4 streams. The proposed Module 5 (100ML/day) will share an outlet channel with module 4. The channel to the Module 4/5 inlet works is equipped with a venturi flume. The purpose of the venturi flume is twofold. It is firstly required to meter the incoming flow to the new inlet works and secondly it is required to control an upstream side weir so as to divert storm flows in excess of 2,25 x ADWF to the existing storm dam adjacent to the Module 1 – 3 inlet works.

#### 1.4.2 Screening

Immediately downstream, the inlet works are equipped with two (2) mechanical screens which are front raked, multiple rake continuous chain type with a 10 mm opening wedge section screen field, discharging to a hydro conveyer that transport screenings by recirculated screened and degrittied raw sewage. The screenings stream is impacted by high energy jets to break up biodegradable solids before being discharged onto a static screen at the entry into a mechanical

press. Excess water is returned to the main sewage stream and the pressed screenings are discharged into a container for disposal.

The stone trap, coarse screen and mechanical screen are positioned in two parallel channel sections which can be individually isolated by sluice gates for routine cleaning or equipment maintenance. Drains to a common sump equipped with a pump are provided for emptying the screens channels.

The total flow goes through four (4) degritters for sand and grit removal. A submersible pump in each tank transfers the settled grit to two inclined screw classifiers where the grit is washed and dewatered. The wash water is returned to the flow. The dewatered grit is deposited in a skip, which is periodically carted off site to dispose of the grit and sand at the disposal site.

### **1.4.3 Flow Balancing**

The streams go into balancing tanks for Modules 2, 3 and 4 and a separate tank for Module 4 and proposed module 5.

### **1.4.4 Primary Treatment**

The Primary Settlers are circular tanks equipped with scum removal equipment, a rotating bridge with sludge scrapers and a central sludge hopper for the collection of the sludge. Modules 1, 2 and 4 have two (2) Primary Settling Tanks (PSTs) each, while the proposed Modules 5 will have four (4) PSTs.

The proposed 100Ml/d Module 5 will require four 34meter diameter primary settling tanks (PST's). The tanks will have 4 m side wall depths. The PST conical floor will slope to the centre at 9° (to horizontal), with a sludge hopper diameter of 3600 mm and 60° side slopes. All peaks exceeding the balancing tank capacity (flows in excess of 1.25xADWF when the tank is full) will bypass directly to the emergency storage dam.

At all the existing modules the PSTs are used for the elutriation of sludge. The sludge is removed from the PSTs and pumped via the primary sludge recycle pumps. Some of the sludge is recycled back to the PSTs in order to provide sufficient retention time to maximise the formation of volatile fatty acids. The balance of the sludge is wasted to the Carrousel Pump Station primary sludge sump.

### **1.4.5 Biological Nutrient Removal**

The biological reactor consists of Modules A and B which are a mirror image of each other and consist of anaerobic, anoxic and aerated zones. The activated sludge from the bioreactor is settled in four (4) SSTs; two (2) per module. There is a Return Activated Sludge (RAS) Pump Station that recycles the settled sludge in the SSTs back to beginning of the bioreactor. WAS is drawn from bioreactor and flows under gravity to the Pump Station. The design of the BNR activated sludge process is based on certain process and parameters, sewage characteristics, oxygen requirements and recirculation rates.

### **1.4.6 Primary Treatment**

The current existing 50Ml/d Module 4 has four 34 meter diameter clarifiers designed for a peak flow factor of 1.25. The tanks will have 4 m side wall depths. The clarifier conical floor will slope towards the centre at 5° (to horizontal), with a sludge hopper diameter of 3600 mm and 60° side slopes. The clarifier design is based on a maximum MLSS of 4000 mg/l with DSVI's of up to 200 ml/g. The proposed Module 5 (100Ml/day) is proposed to be designed similarly but with double mirrored capacity.

### **1.4.7 Chemical dosing and Disinfection**

A back up ferric dosing is required to minimise the impact of biological phosphate removal process failure. The treated effluent from Module 1, 2, and 3 flows into a separate chlorine contact tank (CCT), while module 4 will share a contact tank with the proposed module 5. The contact tank is designed for a hydraulic retention time of 30 minutes during PWWF conditions. It comprises of two plug-flow channels of approximately equal volume; one inner spiral channel and one outer concentric channel. The total disinfected effluent from Modules 1, 2, 3, 4 and in future module 5 is conveyed via pipeline to a series of nine (9) maturation ponds and then flows to the Kliprivier.

## 1.4.8 Sludge Thickening and Stabilisation

The WAS sludge from all Modules is pumped to the central screening facility. The sludge is screened and is then pumped to the DAF units for thickening. The thickened secondary sludge is returned the Pump Station from where it can either be discharged to the sludge lagoons or the anaerobic digesters.

## 1.4.9 Anaerobic digestion

The existing Module 2 and 3 digesters are high rate units heated to the mesophylic range of 35 °C to 37 °C and fully mixed. Each of the existing six units has a capacity of 3600 kl. The combined parameters for modules 2, 3 and 4 are summarised as follows:

• Primary sludge module 2, 3 & 4	860 kg/d
• VSS content at 85% 3	9 831 kg/d
• Module 2, 3 & 4 WAS sludge	18 047 kg/d
• VSS content at 80%	14 979 kg/d
• Total VSS mass	54 810 kg/d
• VSS loading rate	2.11 kg/kl.d
• Volume primary sludge at 6%	781 kl/d
• Volume DAF sludge at 3.5%	301 kl/d
• Total sludge volume	756 kl/d
• Hydraulic retention	20 days

No new digesters will be constructed for the purposes of this expansion. The construction of additional digesters in future is being considered by ERWAT.

## 1.4.10 Sludge disposal

The Waterval Waste Water Treatment Works is discharging effluent, after treatment, to the Klip River and disposing of sludge in sludge drying beds. The digested sludge is applied to nearby farmland on which various crops are grown. A total of 300 ha of farmland are available for sludge drying, with 120 ha being used for the cultivation of maize on an annual basis. No additional land is required for the drying of sewage sludge from the new module.

## 1.5 Environmental Setting

The proposed foot print for the upgrade of the WWCW is currently vacant unused land.

The study area falls in Quarter Degree Grid Cell (QDGC) 2628AC between 26°26'22.07" - 28°05'50.79" south and 26°26'27.55 - 28°05'49.63" east. The study area is located within Downstream Vaal Dam sub water management area of the Upper Vaal Management Area (WMA) in the Quaternary Catchment C22C at the confluence of the Klip River and the Rietspruit.

Surrounding land uses within the site include vegetable-, dairy- and live stock farming on small agricultural small holdings. The residential areas of Klipwater and the agricultural smallholdings of Green Valley, Gardenvale and Garthdale are virtually located in close proximity of the Waterval Works.

### 1.5.1 Drainage

As mentioned, the Waterval Works has been licensed (**Licence No. 08/C22C/fg/646**, refer to **Appendix J**) by the Department of Water Affairs to discharge wastewater into the Klip River and dispose of sludge into sludge drying beds. The Waterval Work's discharge point into the Klip River is immediately upstream of the confluence of the Klip River and Rietspruit. The Klip River originates on the southern side of the Witwatersrand Ridge draining the western and southern parts of Johannesburg including, Soweto and Lenasia.

The main contributions to inflow to the Klip River, other than purified wastewater, are underground mine water, urban run-off from Greater Soweto, parts of Roodepoort and Johannesburg and flow from the Rietspruit which drains the Alberton, Germiston and Boksburg areas. Collectively, these inputs to the Klip River impact negatively on downstream utilisation of the river water by domestic, agricultural, recreational and industrial users as well as the natural environment. Pollutant loads in the Klip River ultimately impact on the Vaal River Barrage and the Vaal River, which form a major part of the water resource for the Gauteng province, and beyond. High levels of bacteriological contamination present a potential health risk for users in the Klip and Vaal Rivers whilst high nutrient levels have been linked to the eutrophication related problems in the Vaal River (Scoping report, 2006).

The Rietspruit catchment has a similar complexity to that of the Klip River, with areas of high-density urbanisation, industrialisation and a large number of point discharges. Amongst these are discharges from the Dekema, Rondebult and Vlakplaats WCWs and diffuse inputs from Katlehong, Tokoza and Vosloorus (SSI and PHD, 1996). It is important to note that in terms of water quality of the Klip River since it is considered a point source input to the Klip River that eventually joins the Vaal River at Vereeniging.

Effluent discharges from Waterval works may negatively impact the quality of receiving waters, affecting water chemistry, microbiology, water temperature, turbidity and colour. Other impacts include potential groundwater contamination following the application of sewage sludge to land, unlined sludge drying beds and co-disposal at solid waste landfill sites. Potential significant impacts associated with effluent discharge include eutrophication of the receiving water body, scum development on dams and lakes, poisoning and killing of wildlife including aquatic fauna, and health risks associated with contact recreation in/on receiving water bodies.

### 1.5.2 Hydrogeology of the study area

The information presented below is based on the Geohydrological report compiled by Ground Water Consulting Services (GCS) in 2006 and an Addendum to the geohydrological report was compiled by Future Flow Groundwater Project Management Solutions (FFGPMS) in September 2013. The geohydrological conditions of the site is briefly presented as follows:

#### a) Aquifer description

Two aquifers occur in the area. These two aquifers are associated with the upper weathered material, and the underlying weathered, fractured rock material.

- Upper weathered material aquifer

The upper aquifer forms due to the vertical infiltration of recharging rainfall through the weathered material being retarded by the lower permeability of the underlying competent rock material. Groundwater collecting above the weathered / unweathered material contact migrates down gradient along the contact to lower lying areas. In places where the contact is near surface, the groundwaters can daylight on surface as baseflow contribution into the Rietspruit and Klip River.

Aquifer thickness data was available from boreholes identified in the hydrocensus carried out by GCS in 2006. The recorded data shows that the upper weathered aquifer has an average thickness of approximately 5 m, and can range between 1 and 10 m in thickness. Borehole yields of the upper aquifer will be seasonally variable and it is considered that effective recharge from rainfall will be around 1 to 3 % in areas underlain by quartzites and shales, and up to 25 % of MAR in areas underlain by dolomite.

- Lower fractured rock aquifer

Pump testing that was conducted in 2006 revealed that the fracture networks and storage coefficients are well developed in the area.

The karst type aquifer borehole typically yields more than 5 L/s and according to the South African Aquifer System Management Classification the aquifer is classified as a major aquifer system.

b) Depth to groundwater level

Based on the geohydrological investigations that were recently undertaken, the depth to groundwater level in general ranges between 0.98 and 4.76 m below surface. The boreholes located near the Waterval Works; in proximity to the Rietspruit and Klip River (GCS 2) indicate shallow static water levels. The shallow water levels may be due to the water levels in the river recharging the aquifers, thereby causing locally elevated groundwater levels along the river course.

Plotting groundwater level elevation versus topographical elevation for this project area yields a 95% correlation. Please refer to **Appendix D1** for specific details on the correlation. This possibly indicates that the Waterval Works' activities do not currently have an impact on the groundwater levels in the boreholes visited during the hydrocensus.

c) Groundwater use

Groundwater is not the sole source of water supply to the local landowners as the Municipality supplies water services to the area. The other groundwater users in the study area include vegetable, dairy and livestock farmers on the small agricultural holdings of Garthdale, Gardenvale and Green Valley.

The local farm owners in the immediate vicinity of the Waterval Works make little use of the groundwater resources due to the large volumes of surface water that is available from the Rietspruit and Klip River. However from the DWA 1999 geohydrological map, the Alberton area abstracts an estimated 10 million m<sup>3</sup>/a.

d) Ground water quality

Water quality monitoring of the site is currently undertaken at 12 (twelve) monitoring points at varying intervals (weekly, monthly, quarterly and annually). The monitoring points and their positions are presented in the Table below.

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Monitoring Point	Monitoring Position	
	Latitude	Longitude
Waterval Waste Water Treatment Works Influent	26 °26'17.49"S	28 °05'36.30"E
Waterval Waste Water Treatment Works Effluent	26 °26'17.49"S	28 °05'36.30"E
Witkop 1	26 °27'43.88"S	28 °05'55.47"E
Witkop 2	26 °27'27.94"S	28 °05'30.07"E
Waterval 1	26 °26'42.06"S	28 °05'42.91"E
Waterval 2	26 °26'47.28"S	28 °05'25.27"E
Waterval 3	26 °27'05.03"S	28 °06'09.25"E
Waterval 4	26 °26'53.88"S	28 °06'19.57"E
Waterval – Rietspruit	26 °26'54.86"S	28 °05'37.63"E
Klip River upstream	26 °25'59.63"S	28 °05'44.24"E
Rietspruit Upstream	26 °26'54.86"S	28 °05'37.63"E
Klip River downstream (after confluence with the Rietspruit)	26 °27'16.88"S	28 °05'07.81"E

**Table 1:** Monitoring Points in and around Waterval Works (Re-Solve Consulting Pty Ltd)

Boreholes in and around the Waterval Works are being sampled and tested against the water quality limits as set by the Department of Water Affairs, Water Quality Objectives as established by the Klip River Forum and those standards that are included in the Licence issued by DWA. The Water Quality status report undertaken for monitoring period June 2011 – May 2012 has concluded that ERWAT is generally complying with the water quality standards as set in the Licence for the quality of the treated effluent discharged into the Klip River. It was further a conclusion of this assessment that there is no immediate evidence that the Waterval WWTW is having an impact on the groundwater.

### 1.6. Project Motivation

In semi-arid South Africa, water is extremely scarce and most rural and suburban communities do not have access to residential waterborne sanitation systems. Furthermore the worsening state of municipal wastewater treatment plants has led to numerous problems in terms of drinking water contamination by wastewater outfalls, and this continues to result in regular outbreaks of waterborne diseases such as cholera and typhoid fever. South Africa is in urgent need of new wastewater treatment plants, upgrades of existing installations and proper training of municipal technical and operating staff manning these wastewater treatment plants ([http://www.globe-net.ca/market\\_reports/index.cfm?ID\\_Report=918](http://www.globe-net.ca/market_reports/index.cfm?ID_Report=918)).

It is envisaged that the increase in capacity of the Waterval Works will provide for more effective wastewater treatment in terms of treated effluent quality as well as present and future quantity. Other benefits that will come with the project include the following:

- Increased efficiency of the Waste Water Treatment Works through the use of new technologies;
- Provision of a link services to the Waterval Works and its surrounding areas that do not have a link to bulk water and sanitation service e.g. Garthdale Agricultural Holdings may benefit;
- Employment opportunities during the construction phase;
- Energy efficiency through the use of new technologies;

- The reliability of the plant operation through additional infrastructure and back-up facilities;
- Improvement in the quality of effluent discharged into the system;
- The project will improve the reliability of the plant's operation and performance;
- Project will deploy robust and reliable treatment technologies to comply with regulatory requirements;
- Existing environmental footprint will be reduced, such as odour impacts; and
- Cater for further developments in the area

### 1.7. Specialist studies

Several specialist studies have been undertaken during the Basic Assessment. These specialist studies are attached as **Appendix D** of this BAR. The full impact of construction activities are described in this Draft BAR and assumptions made and any uncertainties and gaps in knowledge are indicated in the specialist report. An indication has been provided by the specialist of the methodology used in determining the significance of potential environmental impacts. The following specialist investigations were conducted based on potentially significant impacts identified by Envirolution Consulting and during the public participation process:

- **Geohydrological Investigation** – The construction of the new module may pose a threat to the groundwater. Groundwater Consulting Service Engineers were thus appointed by ERWAT to investigate the potential impacts associated with the construction of Module 4, Module 5 and future development within the Waterval Works. The Geohydrological report and the Addendum to this report compiled by FFGPMS are attached in **Appendix D1** respectively.
- **Investigation of potential impacts on the River Health (Aquatic assessment)** – In order to ensure that the ecological impact of the project to the surroundings ecological systems is accurately predicted, an aquatic specialist study was undertaken by Strategic Environmental Focus Pty Limited. The specialist report is attached in **Appendix D2**.
- **Biodiversity Assessment (flora and fauna) and Wetland** – The study was required to assess the impact on the existing vegetation and animal species. The study further seeks to advice on any potential wetland/surface water that can be impacted by the proposed expansion. The specialist study was undertaken by Strategic Environmental Focus Pty Ltd. Refer to **Appendix D3** for the Ecological Assessment that was undertaken.
- **Air Quality impact assessment** – The study was required to assess the impact that the proposed expansion will have on air quality and to advise on odour management and mitigation measures. The specialist study was undertaken by USK Consulting. Refer to **Appendix D4** for the mentioned air quality studies.
- **Heritage Impact Assessment** - Investigation on the potential impacts on heritage and cultural features was undertaken by Strategic Environmental Focus. The heritage specialist was appointed to assess the potential occurrence of significant heritage artefacts, graves and cultural sites within the Works on a preliminary basis and advise on any suitable mitigation measures. Refer to **Appendix D5** for the copy of the report.

The specialists generally employed the following basic methodology that included:

- Site visits;
- Sampling, where necessary;
- Desk top studies;
- Assessment of baseline data;
- Assessment of impacts;
- Development of appropriate mitigation measures,
- Recommendations; and
- Documentation of the findings in the form of reports.

It is the conclusion of these specialist studies that the proposed Module is not located in a sensitive environment, no direct impact on heritage, fauna, floral, wetlands, underground and surface water resources are expected. It is a recommendation of the studies that the site be managed to avoid impacts on the surrounding environment.

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### 1.8. Access roads

The proposed sites can be reached via the existing access roads and is easily accessible off the R59. Access to the site is via the R59, Sybrand Van Niekerk Freeway, where one off ramps onto Vereeniging Road in an easterly direction. No roads that trigger NEMA Regulations Listed Activities will be required. The use of roads will be subject to the Environmental Management Programme (EMPr).

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

Listed activity as described in GN R.544, 545 and 546	Description of project activity
<b>National Environmental Management: Waste Act No. 59 of 2008: Category A – GNR 718 : Activity 18</b>	
<i>The construction of facilities for activities listed in Category A of this Schedule</i>	
<b>Category A – GNR 718 : Activity 19</b>	
<i>The expansion of facilities of or changes to existing facilities for any process or activity, which requires an amendment of an existing permit or licence or a new permit or license in terms of the legislation governing the release of pollution or effluent</i>	<b>The increase in capacity of the Waterval works by construction the proposed Module 5 will require an updated Waste Licence</b>
Listed activity as described in GN R.544, 545 and 546	Description of project activity
<b>GN R 544 2010 (Listing Notice 1) Activity 9</b>	
<i>The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water - (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more, excluding where: such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve</i>	<b>The proposed construction of Module 5 at Waterval Works will occur within the existing Waterval Works boundary and the expansion will also include the installation of ancillary sewage infrastructure such as pipelines and associated storm water infrastructure</b>
<b>GN R 544 2010 (Listing Notice 1) Activity 23</b>	
<i>The transformation of undeveloped, vacant or derelict land to – (ii) residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares</i>	<b>The land where the proposed module is to constructed is currently vacant and the Module will be located in a land that is above 1 hectare</b>

## 2. Feasible and Reasonable Alternatives

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

- (a) the property on which or location where it is proposed to undertake the activity;



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- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

Describe alternatives that are considered in this application as required by Regulation 22 (2) (h) of GN R.543. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

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

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

### Site alternatives

*Please note that No site alternatives have been proposed as the proposed development must be located within the Existing works boundary and must link to the ancillary sewage infrastructure*

<b>Proposed Module 5 (preferred alternative)</b>		
Description	Lat (DDMMSS)	Long (DDMMSS)
	<b>26°26'14.87"S</b>	<b>28°5'52.37"E</b>
<b>Alternative 2</b>		
Description	Lat (DDMMSS)	Long (DDMMSS)
No alternatives have been proposed as the proposed development must be located within the Existing works boundary and must link to the ancillary sewage infrastructure	<b>Not applicable</b>	
<b>Alternative 3</b>		
Description	Lat (DDMMSS)	Long (DDMMSS)
	<b>Not applicable</b>	

In the case of linear activities:

**Alternative:**

**Latitude (S):**

**Longitude (E):**

*Not applicable as the project is a footprint development.*

Alternative S1 (preferred)

- Starting point of the activity

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• Middle/Additional point of the activity		
• End point of the activity		
Alternative S2 (if any)		
• Starting point of the activity		
• Middle/Additional point of the activity		
• End point of the activity		
Alternative S3 (if any)		
• Starting point of the activity		
• Middle/Additional point of the activity		
• End point of the activity		

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.

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

### a) Lay-out alternatives

*The waste water treatment has already been designed to accommodate the following systems:*

- Pollution control system.
- Stormwater canal structures
- Concrete line sewage treatment infrastructure
- Polluted water overflow dams
- Applicable lining layers as per the Department of Water Affairs lining requirements

*Thus no layout alternatives are considered.*

<b>Alternative 1 (preferred alternative)</b>		
Description	Lat (DDMMSS)	Long (DDMMSS)
	N/A	
<b>Alternative 2</b>		
Description	Lat (DDMMSS)	Long (DDMMSS)
<b>Alternative 3</b>		
Description	Lat (DDMMSS)	Long (DDMMSS)

### c) Technology alternatives

<b>Alternative 1 (preferred alternative)</b>
<b>Conventional Activated Sludge Process - (preferred alternative)</b>

The conventional activated sludge process is well understood in the world and forms the baseline of the technology used in the treatment of wastewater. The conventional activated sludge systems are based on the principle that wastewater is admitted to that part of the plant which offers the best process conditions (Kruger, 2009). Consequently, different parts of the plant will have different conditions allowing for the total treatment. For the Waterval Works, the process entails the following elements:

- i. Inlet works (Screens)and Degritters;
- ii. Primary settling tanks (depending on the organic loading of the works);
- iii. Biological reactor;
- iv. Secondary settling tanks;
- v. Disinfection; and
- vi. Sludge treatment and disposal

Advantages and Disadvantages regarding this process are tabulated as follows:

Advantages	Disadvantages
Process is well understood.	All biological processes are prone to poisoning by chemical substances.
Industry standard for wastewater treatment.	Dependent on energy supply.
Biological nutrient removal is achievable, i.e. the South African Standards can be achieved.	Requires relative large area.
Huge body of knowledge and experience in South Africa and the world.	Peak flows exceeding the design flows can cause a loss of biomass, and hence a deterioration of the quality of the treated effluent.
Simulation models are readily available.	Requires relative large structures
Fairly stable process.	
Depending on the quality of the wastewater being treated, the solids can be used in certain beneficial applications.	
Robust equipment	

The conventional biological activated sludge method of treatment is the most preferred technology associated with this development.

**Alternative2**

**Alternative 2: The Moving Bed Biological Reactor Process**

The Moving Bed Biological Reactor Process is a fairly new process. It is an activated sludge process incorporating plastic media on which the biomass grows. The design information is not available in the public domain and hence it is not possible to evaluate the process from a theoretical point of view. The nutrient removal is rather seen as a “black box”, and the clients are in the hands of the owners of the technology. A distinct advantage of the process is the fact that the biomass is protected by the media, and hence the process can accommodate relative high flows.

The conventional biological activated sludge method of treatment is the most preferred technology for this development. This method is mostly preferred because the process is currently in use at the Works and hence deemed to be well understood by the operators. The equipment required is robust and its manufacturer’s maintenance schedule should not differ from that of the equipment on site. The site is large enough for the development of such a module.

**d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)**

<b>Alternative 1 (preferred alternative)</b>		
<b>Alternative 2</b>		
<b>Alternative 3</b>		
<b>Alternative 3</b>		

**e) No-go alternative**

*The No-go option implies that the Project does not proceed, and will thus comprise of the Works continuing to be operational with the current capacities. As this capacity has been identified as insufficient to meet the needs of the Works, this is not a feasible option. If the current operation is left to continue as it is, this would serve to reduce the quality standards of the Works and risk contamination of groundwater and disturbance to the natural functioning of local ecosystems. In addition, the anticipated future developments in the Ekurhuleni and Midvaal local municipalities will require adequate and competent sewer treatment infrastructure. Should ERWAT keep the current capacity of the treatment works, it is highly likely that any anticipated future developments will function without adequate sewage infrastructure.*

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

**3. Physical Size of the Activity**

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

**Alternative:**

Alternative A1<sup>1</sup> (preferred activity alternative)  
 Alternative A2 (if any)  
 Alternative A3 (if any)

**Size of the activity:**

	195000m <sup>2</sup>
	N/A
	N/A

or, for linear activities:

**Alternative:**

Alternative A1 (preferred activity alternative)  
 Alternative A2 (if any)  
 Alternative A3 (if any)

**Length of the activity:**

	N/A

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

**Alternative:**

**(preferred activity alternative)**

**Size of the site/servitude:**

	19.5 hectares
	N/A

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<sup>1</sup> "Alternative A.." refer to activity, process, technology or other alternatives.

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Alternative A1 (preferred activity alternative)

Alternative A2 (if any)


### 4. Site access

Does ready access to the site exist?

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

YES	NO
	m

Describe the type of access road planned:

*The proposed sites can be reached via the existing access roads and is easily accessible off the R59. Access to the site is via the R59, Sybrand Van Niekerk Freeway, where one off ramps onto Vereeniging Road in an easterly direction. The impact of the additional trips that will be generated during the construction phase road is regarded as negligible.*

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

### 5. Locality map

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

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

### 6. Layout/route plan

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

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);

## BASIC ASSESSMENT REPORT

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- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

### 7. Sensitivity map

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

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

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

### 8. Site photographs

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

### 9. Facility illustration

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

### 10. Activity motivation

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

<b>1. Is the activity permitted in terms of the property's existing land use rights?</b>	<b>YES</b>		Please explain
The Waterval works are already in existence and is located within the boundaries of the Waterval Waste Water Treatment Works which is already zoned for Waste Water Treatment activities. The Works is currently operated and managed by ERWAT.			

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<b>2. Will the activity be in line with the following?</b>			
<b>(a) Provincial Spatial Development Framework (PSDF)</b>	<b>YES</b>		
<p>Basic service infrastructure indicators suggest that the Midvaal Local Municipality (MLM) compare favourable with the District and Gauteng Province with respect to Water and Sanitation. With regard to Water quality status, the municipality has a Blue Drop (84, 1%). Sewer has a Green Drop (53, 5%).</p> <p>According to the PSDF, Approximately 82% of households in the Midvaal area are served by waterborne sewage, which is relatively high, considering the rural nature and vast extent of the area. Assuming that the pit latrines are not Ventilated Improved Pit Latrines, it could be said that the sanitation backlog in the area is 18% or 5 598 households. It is considered that it is mostly farm labourers and residents of informal settlements who do not have access to proper sanitation facilities, including the Garthdale and Klipwater residents that are located in close proximity of the Waterval Works.</p> <p>According to the PSDF of Ekurhuleni Metropolitan Municipality (EMM), Ekurhuleni has a sanitation backlog of about 18% with about 688 111 household having accessing to water and sanitation and 154 703 households have adequate sanitation infrastructure</p> <p>The expansion of the Waterval works is therefore a strategic move in providing improved quality of water and sanitation supply in the area.</p>			
<b>(b) Urban edge / Edge of Built environment for the area</b>	<b>YES</b>		
The development is outside urban edge.			
<b>(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).</b>		<b>NO</b>	Please explain
<p>The MLM KPA 6: Physical Infrastructure and Energy. Strategic Objective are outlined as follows:</p> <ul style="list-style-type: none"> <li>To ensure appropriately serviced, well maintained physical infrastructure and the efficient use of energy. To plan, construct and maintain water and sanitation infrastructure.</li> </ul> <p>A new 500 mm diameter outfall sewer which will serve the industrial area of Kliprivier and Klipriver Business Park was recently completed. This pipeline has been connected to the Waterval sewer works by means of a rising main Waterval water works: The Klipwater township and industries such as Everite and Nampak drain to this facility. It is one of the reasons why the Waterworks is upgraded</p> <p>Moreover, the Ekurhuleni Municipality has identified the Waterval area (south of Palm Ridge Katlehong) as one of the area that will be targeted for Major Investment and Development Projects for a future large housing development (Ekurhuleni Built Environment Performance Plan, 2012). These are some of the reasons why the Waterworks is upgraded.</p>			
<b>(d) Approved Structure Plan of the Municipality</b>	<b>YES</b>		Please explain
The proposed project entails electricity infrastructure, which is compatible with the Ekurhuleni Metropolitan municipality and MLM with regard to provision of adequate sewage infrastructure.			

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<p><b>(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)</b></p>	YES	NO	Please explain
<p>One of the Strategic Objective of the MLM is to ensure safety within the community as well as a healthy and protected environment and also to contribute to the safety of communities in Midvaal through the pro-active identification, prevention, mitigation and management of environmental health, fire and disaster risks. Although there is no EMF that has been compiled for the area. The Gauteng Conservation Plans and the Waterval Precinct Plan 2011 can be used to guide priority areas in terms of Conservation and protection of these areas to ensure that they are not degraded by mining, industrial, forestry, agricultural and human settlement activities.</p> <p>The Ekurhuleni Metropolitan Municipality Environmental Management Framework together with the Ekurhuleni State of the Environment Report provides a strong Environmental information base for the area. It must be noted that the proposed Waterval Works project falls outside the priority area.</p>			
<p><b>(f) Any other Plans (e.g. Guide Plan)</b></p>	YES		Please explain
<p>The Gauteng Conservation Plans. The Ekurhuleni Municipality Environmental Management Framework and the Waterval Precinct Plan 2011 can be used to guide priority areas in terms of Conservation and protection of these areas to ensure that they are not degraded by mining, industrial, forestry, agricultural and human settlement activities.</p>			
<p><b>3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?</b></p>	YES		Please explain
<p>The proposed development is in line with the National Development Plan, the Midvaal SDF's and Ekurhuleni Metropolitan Municipality IDP's, which related to the provision and improvement of quality of water and sanitation supply in the Ekurhuleni and Midvaal areas.</p>			
<p><b>4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)</b></p>	YES		Please explain
<p>According to Waterval precinct 2010 (2010 draft), The ERWAT Sewer Treatment Plant service all the development within and around the Waterval Precinct. The agricultural holdings of Garthdale and Gardenvale towards the east have no piped sewer systems while Klipwater has a rudimentary sewer system linked to the Erwat plant. The expansion of the Waterval Works can be a strategic move to improve the state of bulk sewer supply in the area.</p>			



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<p><b>5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</b></p>	<p><b>YES</b></p>		<p>Please explain</p>
<p>The proposed project is the expansion of an existing sewage infrastructure aimed at improving the quality of supply. All the support services e.g. water, electricity and access roads are already available. It will however improve the quality/efficiency of waste water treatment services in the surrounding areas. Upgrade of the current sewage infrastructure will also cater for further developments in the area there expedite economic growth and development in the area.</p>			
<p><b>6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</b></p>	<p><b>YES</b></p>		<p>Please explain</p>
<p>The proposed project is the expansion of the existing sewage infrastructure aimed at improving the quality of supply. All the support services e.g. water, electricity and access roads are already available. It will however improve the quality/efficiency of waste water treatment services in the surrounding areas. Upgrade of the current sewage infrastructure will also cater for further developments in the area there expedite economic growth and development in the area.</p>			
<p><b>7. Is this project part of a national programme to address an issue of national concern or importance?</b></p>	<p><b>YES</b></p>		<p>Please explain</p>
<p>Acceleration of identified water and sanitation infrastructure has been highlighted as of importance in unlocking the socio economic opportunities in South Africa.</p>			
<p><b>8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)</b></p>	<p><b>YES</b></p>	<p><b>NO</b></p>	<p>Please explain</p>
<p>The proposed project is an expansion of the existing waste water treatment works located within the ERWAT Works boundaries.</p>			
<p><b>9. Is the development the best practicable environmental option for this land/site?</b></p>	<p><b>YES</b></p>	<p><b>NO</b></p>	<p>Please explain</p>
<p>The Waterval Works is located within the existing Works boundaries and tallies with the current land use.</p>			
<p><b>10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?</b></p>	<p><b>YES</b></p>	<p><b>NO</b></p>	<p>Please explain</p>
<p>The objective of the proposed Module expansion is to increase current capacity of the Waterval works in order to cater for future and anticipated developments in and around the area.</p>			

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<b>11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?</b>	YES	NO	Please explain
The Waterval Works is located within the existing Works boundaries and tallies with the current land use.			
<b>12. Will any person's rights be negatively affected by the proposed activity/ies?</b>	YES	NO	Please explain
The expansion of the Waterval Works will not negatively affect any persons rights as the site is located within the Waterval Works boundary zoned for the current service.			
<b>13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?</b>	YES	NO	Please explain
The Waterval Works is located in an already transformed area outside the urban edge			
<b>14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?</b>	YES	NO	Please explain
Acceleration of identified water and sanitation infrastructure has been highlighted as of importance in unlocking the socio economic opportunities in South Africa. (SIP 18). A 10-year plan to address the estimated backlog of adequate water to supply 1.4 m households and 2.1 m households to basic sanitation is incorporated in SIP 18. The project will involve provision of sustainable supply of water and sanitation in order to meet social needs and support economic growth. Projects will provide for new infrastructure, upgrading of existing infrastructure, as well as improve management of sewerage infrastructure.			
<b>15. What will the benefits be to society in general and to the local communities?</b>	Please explain		
The provision of a sustainable supply of water and sanitation to meet social and health needs.			
<b>16. Any other need and desirability considerations related to the proposed activity?</b>	Please explain		
The proposed project will ensure that new infrastructure and upgrading of existing infrastructure, as well as improve management of sewage infrastructure to cater for social and health and household needs.			
<b>17. How does the project fit into the National Development Plan for 2030?</b>	Please explain		
CHAPTER 4 of the National Development Plan 2030 on Economic Infrastructure has outlined has identified the supply of water and sanitation infrastructure a one of the Economic the foundation of social and economic development. The expansion of the Waterval Works serves to improve the quality/efficiency of the sanitation of areas within and around the Works.			
Before 2030, all South Africans will have affordable, reliable access to sufficient safe water and hygienic sanitation. This economic infrastructure is a precondition for providing basic services such as electricity, water, sanitation, telecommunications and public transport, and it needs to be robust and extensive enough to meet industrial, commercial and household needs.			

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**18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.**

This report serves as a Basic Assessment report that will investigate all potential impacts (social, economic and environmental) that may result from the development including alternatives, assess and evaluate and further provide a mitigation plan for all identified potential impacts.

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

Specialist opinions (fauna, flora, wetland, geotechnical, and geohydrological and air quality) were appointed to investigate potential environment impacts. Identified environmental impacts were assessed and mitigation measures provided to control and manage these environmental impacts. Interested and Affected parties, land owners and relevant stakeholders were identified and involved throughout the Basic Assessment process and their comments addressed and recorded as part of this assessment.

### 11. Applicable Legislation, Policies and/or Guidelines

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

<b>Title of legislation, policy or guideline</b>	<b>Applicability to the project</b>	<b>Administering authority</b>	<b>Date</b>
National Environmental Management Act, No. 107 of 1998 (NEMA), as amended & NEMA EIA Regulations, 2010: GN544, published in Government Gazette 33306 on 18 June 2010	A Basic Assessment Report (BAR) is required for this project.	Department of Environmental Affairs (DEA)	1998
National Environmental Management: Waste Act No. 59 of 2008: Category A – GNR 718 : Activity 18	The expansion of the Waterval Works will require a Waste Licence as it is listed activity under this Act	Department of Environmental Affairs (DEA)	1998
National Environmental Management: Biodiversity Act, Act 10 of 2004	The Gauteng Conservation Plans and the Waterval Precinct Plan 2011 can be used to guide priority areas in terms of Conservation and protection of these areas to ensure that they are not degraded by mining, industrial, forestry, agricultural and human settlement activities.	Department of Environmental Affairs (DEA)	2004
National Water Act, No. 36 of 1998	The expansion of Waterval works will require the update of the existing Water use Licence	Department of Water Affairs (DWA)	1998
National Heritage Resources Act (Act No 25 of 1999)	Resources could be identified during the expansion of the Waterval Works	South African Heritage Resources Agency	1999
National Environmental	Although not a listed activity	Department of	2009

## BASIC ASSESSMENT REPORT

Management Act, Air Quality Act	under the NEMQA, this Act is to regulate the \ air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation	Environmental Affairs (DEA)	
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### 12. Waste, Effluent, Emission And Noise Management

#### a) Solid waste management

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

<b>YES</b>	<b>NO</b>
30m <sup>3</sup>	

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

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

Construction waste will be removed from site by the appointed contractor to a registered waste disposal site. Small quantities of solid waste will be generated during the operational phase of the development will also disposed off at the nearest registered landfill site.

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

General waste from the site will be collected by waste trucks on a weekly basis and disposed off at the nearest registered landfill site.

Will the activity produce solid waste during its operational phase?

<b>NO</b>	<b>NO</b>

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

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

Waste will be collected by waste trucks on a weekly basis and disposed off at a registered landfill site.

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

Regional landfill site north of Suikerbos nature reserve

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

N/A

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

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

<b>YES</b>	<b>NO</b>
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If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

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

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

BASIC ASSESSMENT REPORT

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**b) Liquid effluent**

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

	<b>NO</b>
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If YES, what estimated quantity will be produced per month?

	m <sup>3</sup>
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Will the activity produce any effluent that will be treated and/or disposed of on site?

	<b>YES</b>
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*If YES, the applicant should consult with the competent authority to determine whether it is necessary. The main objective of this BA is to increase current capacity for waste water treatment facility. Sewage that will be produced will be treated on-site*

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

<b>YES</b>	
------------	--

If YES, provide the particulars of the facility:

<b>Facility name:</b>	Waterval Waste Water Treatment Works		
<b>Contact person:</b>	Midvaal Local Municipality		
<b>Postal address:</b>			
<b>Postal code:</b>			
<b>Telephone:</b>		<b>Cell:</b>	
<b>E-mail:</b>		<b>Fax:</b>	

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

Treated effluent will comply with irrigation standards and will be used for site irrigation
---------------------------------------------------------------------------------------------

**c) Emissions into the atmosphere**

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

	<b>YES</b>
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If YES, is it controlled by any legislation of any sphere of government?

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

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

There is a possibility that dust will be generated during construction phase, particularly during high wind conditions. Mitigation measures suggested to control dust generation in subsequent sections will ensure that the concentration is insignificant. The Air Quality Assessment report is attached as <b>Appendix D5</b> . Mitigation measures to ameliorate dust are also detailed in this report.
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**d) Waste permit**

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

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

**e) Generation of noise**

Will the activity generate noise?

YES	<b>NO</b>
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## BASIC ASSESSMENT REPORT

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

YES	NO
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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:

Noise will be generated by the plant machinery and delivery trucks during the delivery construction material on site. It is however unlikely however that this noise will be at a level higher than the existing ambient noise resulting from the arterial roads and surrounding industrial activities. All construction equipment must be maintained and kept in good working order to minimise associated noise impacts. If required, adequate noise suppression measures (i.e. screens, etc) must be erected around the operational point source

### 13. Water use

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

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

	litres
	<b>YES</b>

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

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

*ERWAT will apply for an update of the current Water use Licence from the Department of Water Affairs following approval of this application.*

### 14. Energy efficiency

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

- Electricity - Apart from the use of energy efficient lighting at the Works , no other measures are considered  
 -Fuel and Oil - Delivery Vehicles and other construction equipment will use petrol, diesel and oil. Use and number of such vehicles and machinery will be restricted to that which is absolutely necessary for material delivery.

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

Energy efficient lighting will be used where practical

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

**Important notes:**

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

**Section B Copy No. 1 (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? 

<b>YES</b>	
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See **Appendices D1** (Geohydrological report), **D2** (Aquatic Assessment), **D3** Ecological (Flora and Fauna), **D4** (Air Quality Assessment), **D5** (Heritage Assessment), for the specialist studies that were conducted.

If YES, please complete the form entitled “Details of specialist and declaration of interest” for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.

**Property description/physical address:**

<b>Province</b>	Gauteng Province
<b>District Municipality</b>	Sedibeng District Municipality
<b>Local Municipality</b>	Midvaal Local Municipality
<b>Ward Number(s)</b>	Ward No 10, 11 and 12
<b>Farm name and number</b>	Farm Waterval 150
<b>Portion number</b>	Portion 50
<b>SG Code</b>	T01R0000000015000050

Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application including the same information as indicated above.

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

Industrial – Waste Water Treatment Works

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

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

<b>NO</b>	NO
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# BASIC ASSESSMENT REPORT

## 1. Gradient of the site

Indicate the general gradient of the site.

### Alternative S1:

Flat	1:50 – 1:20		1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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### Alternative S2 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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### Alternative S3 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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## 2. Location in landscape

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

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

## 3. Groundwater, soil and geological stability of the site

*Further details on the Geohydrological reports attached as **Appendix D1**.*

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

	Proposed alignment:	Alternative 1 (if any):	Alternative 2 (if any):
Shallow water table (less than 1.5m deep)	NO	YES NO	YES NO
Dolomite, sinkhole or doline areas	NO	YES NO	YES NO
Seasonally wet soils (often close to water bodies)	NO	YES NO	YES NO
Unstable rocky slopes or steep slopes with loose soil	NO	YES NO	YES NO
Dispersive soils (soils that dissolve in water)	NO	YES NO	YES NO
Soils with high clay content (clay fraction more than 40%)	NO	YES NO	YES NO
Any other unstable soil or geological feature	NO	YES NO	YES NO
An area sensitive to erosion	NO	YES NO	YES NO

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



**4. Ground cover**

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

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

*According to the Ecological report, the study site consisted of transformed habitat which was dominated by alien plant species such as Bidens pilosa, Pennisetum clandestinum and Datura stramonium with no indigenous flora recorded at the time of the survey.*

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.

*See also Ecological Assessment report attached as **Appendix D3**.*

**5. Surface water**

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

<b>Perennial River</b>	<b>YES</b>		UNSURE
Non-Perennial River		<b>NO</b>	UNSURE
<b>Permanent Wetland</b>		<b>NO</b>	UNSURE
<b>Seasonal Wetland</b>		<b>NO</b>	UNSURE
<b>Artificial Wetland</b>		<b>NO</b>	UNSURE
Estuarine / Lagoonal wetland	YES	<b>NO</b>	UNSURE

## BASIC ASSESSMENT REPORT

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If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse. *Please note this information is taken from the Ecological Assessment report undertaken by Strategic Environmental Focus.*

The study site falls within Downstream Vaal Dam sub water management area of the Upper Vaal Management Area (WMA) in the Quaternary Catchment C22C at the confluence of the Klip River and the Rietspruit. These two perennial rivers provide the eastern and western of the study site (Please refer to **Figure 2** below).



**Figure 2:** Site hydrology taken from a report compiled SEF:2013

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Apart from the man made maturation dams noted on site, no wetland conditions were recorded within the Waterval Works boundary site. The site is located on the confluence of Rietspruit and Kliprivier. No wetland vegetation or hydromorphic species of concern were recorded on site.

*See also Aquatic Assessment report attached as **Appendix D2**.*

### 6. Land use character of surrounding area

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

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

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

*The activities in the surrounding environment are outside the demarcated Works boundary and will not be directly impacted by the proposed activity.*

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

N/A

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

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

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

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Buffer area of the SKA?	YES	NO
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If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

### 7. Cultural/historical features

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain:	YES	NO
Uncertain		
A heritage impact assessment is attached as <b>Appendix D5</b> .		

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

*The Phase I HIA revealed no heritage resources within the proposed footprint for the upgrade. It is therefore, recommended from a heritage point of view that the proposed upgrade of the Waterworks proceed.*

Will any building or structure older than 60 years be affected in any way?	YES	NO
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES	NO
If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.		

### 8. Socio-economic character

#### a) Local Municipality

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

Level of unemployment:

*According to the IDP and Census 2011 Municipal Fact Sheet, published by Statistics South Africa, the Midvaal Local Municipality a population of about 95 301 of which 12 % are unemployed. It is stated in the IDP that there has been a consistent decline recorded in the unemployment rate since 2002. The major employment sector is services (60.4%), followed by manufacturing (25.1%), whilst Mining (0.4%), Agriculture (2.6%), Electricity (5.7%) and Construction (5.7%) contribute to the GDP of the municipality.*

Economic profile of local municipality:

*Agriculture, mining and the manufacturing sectors are large contributors to the economic growth and employment creation in the municipality. According to the IDP 2013, The primary sector of the economy consists of the agricultural as well as the mining sectors. Mining contributes 0.4% while agriculture contributes 2.6 % to the Midvaal LM GVA and together contributing 3.0%.*

*The secondary sector of the economy consists of manufacturing, electricity and construction. The*

## BASIC ASSESSMENT REPORT

*manufacturing sector is the second largest contributor to the Midvaal Local Municipality s economy, which contributes 36.5% overall. Manufacturing contributes 25.1% followed by Electricity and Construction both contributing 5.7% The Midvaal Local Municipality has recognised the potential that this sector could contribute and therefore adopted the R59 Strategic Framework to promote the R59 Development Corridor.*

*The tertiary sector is basically the services sector as well as the governmental sector which contributes 60.4% to the Midvaal LM GVA.*

Level of education:

*Based on the information provided in the IDP, above 60% of the total population of Age 20+ in Midvaal LM area of jurisdiction has a literacy of grade 7 or higher. In terms of progress in Education statistics reflect that access to education facilities such as schools, libraries etc. are creating a society in Midvaal LM where very few people has no schooling, which contribute to well balanced and sustainable community.*

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

What is the expected capital value of the activity on completion?	R±450 million
What is the expected yearly income that will be generated by or as a result of the activity?	None as no income will be generated from the facility
Will the activity contribute to service infrastructure?	<b>YES</b> <b>NO</b>
Is the activity a public amenity?	<b>YES</b> <b>NO</b>
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	Unknown
What is the expected value of the employment opportunities during the development and construction phase?	To be confirmed
What percentage of this will accrue to previously disadvantaged individuals?	To be confirmed
How many permanent new employment opportunities will be created during the operational phase of the activity?	Unknown
What is the expected current value of the employment opportunities during the first 10 years?	Unknown
What percentage of this will accrue to previously disadvantaged individuals?	Unknown

## 9. Biodiversity

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult <http://bgis.sanbi.org> or [BGIShelp@sanbi.org](mailto:BGIShelp@sanbi.org). Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/ EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix D to this report.

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

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
Critical Biodiversity Area (CBA)	Ecological Support Area (ESA)	Other Natural Area (ONA)	No Natural Area Remaining (NNR)	The expansion will occur within the existing Waterval Works boundary.

Due to the transformed nature of the site and the fact that the expansion will occur within the existing Waterval Works boundary, no impact on natural vegetation and habitat is anticipated. The proposed study site is dominated by alien plant species such as *Bidens pilosa*, *Pennisetum clandestinum* and *Datura stramonium* with no indigenous flora recorded on site.

According to the Ecological specialist, faunal diversity directly associated with the study area was very low, with only onemammal species, *Cynictis penicillata* (Yellow mongoose) confirmed within the study area. However, the open sewage treatment dams immediately west of the study area supported numerous avifaunal species including *Phoenicopterus ruber* (Greater flamingo) which is currently listed as Near Threatened. No wetlands were noted to occur within the study area. Mitigation measures to protect the potential impact on the ecological re are provided in environmental are contained in the Ecological assessment (**Appendix D3**) undertaken during the Basic Assessment.

- b) Indicate and describe the habitat condition on site

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).
Natural	0%	There is no Natural vegetation remaining on site as the site is degraded by waste water works treatment activities.
Near Natural (includes areas with low to moderate level of alien invasive plants)	0%	Very low, the site is dominantly composed of alien and invader species.
Degraded (includes areas heavily invaded by alien plants)	100%	There is no natural vegetation on site as the site is degraded by waste water works treatment activities consisting of transformed habitat dominated by alien plant species such as <i>Bidens pilosa</i> , <i>Pennisetum clandestinum</i> and <i>Datura stramonium</i> with no indigenous flora.
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	100%	The entire site to the north is currently used for waste water treatment activities

## BASIC ASSESSMENT REPORT

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*It is apparent from the above table that the proposed study site was found not to be sensitive from a vegetation perspective. Please refer to **Appendix D3** for the Ecological assessment undertaken.*

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

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

Terrestrial Ecosystems		Aquatic Ecosystems					
<b>Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)</b>	Critical	Wetland (including rivers, depressions, channelled and unchannelled wetlands, flats, seeps pans, and artificial wetlands)	Estuary			Coastline	
	Endangered						
	Vulnerable						
	<b>Least Threatened</b>	NO	UNSURE	YES	NO	YES	NO

*Although no wetland conditions were recorded within the Waste water treatment site, it must however be noted that the Kliprivier and the Rietspruit are located in close proximity thus management of wastewater activities is of importance. Please also refer to **Appendix D2** for details regarding the aquatic environment.*



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

According to the floral assessment undertaken, the Waterval Works site is devoid of any natural occurring vegetation communities. The study area has historically been cleared from all indigenous vegetation and at the time of the survey consisted of alien plant assemblages and bare ground with no indigenous species recorded (Please refer to photo plates below). Alien species recorded at the time of the survey included *Datura stramonium* (Thorn apple), *Bidens pilosa* (Blackjack), *Pennisetum clandestinum* (Kikuyu grass) and *Verbena bonariensis* (Purple top).



**Plate1:** The site viewed from the west. Note extent on alien species observed on site

According to the C-Plan, due to the historically transformed state of the study area, this area is not prioritized for conservation. No Critically Endangered, Endangered, Vulnerable or Near Threatened species were recorded on site. Due to the high level of transformation, no suitable habitat for any of the provincially protected species exists within the study area. No indigenous flora was recorded in the study area at the time of the survey.

The faunal habitat directly associated with the study area consisted of transformed habitat dominated by alien plant species such as *Bidens pilosa* (Blackjack), *Pennisetum clandestinum* (Kikuyu grass) and *Datura stramonium* (Thorn apple) while the sewage dams east of the study area provided suitable habitat for numerous bird species. With regard to avifaunal species, Seventeen species of conservation concern (i.e. with a status higher than Least Concern) have been recorded from QDGC 2628AC, one of these, *Phoenicopterus ruber* (Greater flamingo) was confirmed in the sewage dams immediately west of the study site. According to the Ecological report, four (4) species have a medium probability of utilizing the study area and immediate surroundings for foraging.

The degraded nature of the habitat, proximity of infrastructure (waste water treatment plant and houses) and small size of the study area resulted in very low mammal activity with only one species, *Cynictis penicillata* (Yellow mongoose) confirmed at the time of the survey. The treatment dams located immediately west of the study area is highly likely to provide suitable habitat for at least six amphibian species. Although the study area was largely transformed, the sewage treatment dams west of the study area provided suitable habitat for some reptile species. Furthermore, reptiles are considered to be adaptable to human disturbance and transformation and it is thus still possible that some reptile species might occur in the transformed study area.

Although no species were recorded during the field survey, six (6) species were given a high probability of occurring in the study area while a further eleven (11) have a medium probability of occurring within the study area. None of the species have been evaluated to determine their conservation status.

## SECTION C: PUBLIC PARTICIPATION

### 1. Advertisement and notice

#### Advert No 1

<b>Publication name</b>	Alberton Records	
<b>Date published</b>	03 April 2013	
<b>Site notice position</b>	<b>Latitude</b>	<b>Longitude</b>
<b>Date placed</b>	03 April 2013	

#### Advert No 2

<b>Publication name</b>	Meyerton Ster and Vanderbijl Ster	
<b>Date published</b>	02 April 2013	
<b>Site notice position</b>	<b>Latitude</b>	<b>Longitude</b>
<b>Date placed</b>	02 April 2013	

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

### 2. Determination of appropriate measures

Provide details of the measures taken to include all potential I&APs as required by Regulation 54(2)(e) and 54(7) of GN R.543.

Key stakeholders (other than organs of state) identified in terms of Regulation 54(2)(b) of GN R.543:

<b>Title, Name and Surname</b>	<b>Affiliation/ key stakeholder status</b>	<b>Contact details (tel number or e-mail address)</b>
Mr Andrew Barker	Klipriviersberg Sustainability Association	Cell: 27 (0)83 274 4424 chairman@klipsa.org.za
Gauteng Wetland Forum	Gauteng Wetland Forum	Please refer to database attached as Appendix E for all I&AP details
R du Toit	Klipriver-Suikerboschrand Conservancy	Tel: 082 515 2884 Email: propprojects@vodamail.co.za
Mark de fontein	Rand Water	Tel: +27 (0)11 682 0264 Email: marcdef@randwater.co.za)
	Residents and property owners (Gardenvale and Klipwater)	Please refer to database attached as Appendix E for all I&AP details

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

- e-mail delivery reports;
- registered mail receipts;
- courier waybills;
- signed acknowledgements of receipt; and/or
- or any other proof as agreed upon by the competent authority.

## BASIC ASSESSMENT REPORT

### 3. Issues raised by interested and affected parties

Summary of main issues raised by I&APs	Summary of response from EAP
Detailed information on the proposed expansion	ERWAT proposes to increase the storage capacity of their existing Waste Water Treatment Works by increasing the treatment capacity by 100ML. The existing capacity of the Waterval Works is 155ML/day. The proposed capacity will be increased by 100ML, to a total of 255ML/day. Further details are outline in <b>Section A</b> of this draft BAR.
Mitigating measures to prevent seepage/spills into the Klip River and Rietspruit and wetlands	Appropriate lining as per the DWA requirements will be used to prevent any potential spillage/seepage into the environment, including the Klip River and Rietspruit and wetlands. Ground and Surface water runoff from the site may drain/seep into Klip River and Rietspruit and wetlands. Treated effluent will be in line with DWA Special (treatment and discharge) Standards and can therefore not contaminate the groundwater or the watercourses. The associated impacts have been addressed in this BA. Mitigation measures have also been given to avoid risks of contaminating both surface and groundwater.
Sludge management, treatment and disposal	Currently, digested sludge will be disposed of to the sludge lagoons. It is a recommendation of this BA that ERWAT consider disposing of the sludge in agricultural lands or consider other environmental accepted disposal methods. If treated effluent will be used for irrigations purposes, therefore the quality of the final effluent must comply with general standards issued by the Department of Water Affairs
Response on main sewer line issues leaking on R550 where effluent continues to leak into the Rietspruit	Issues related to the main sewer line leakage are considered to be outside of the scope of this EIA.ERWAT will in future conduct feasibility studies to look at the capacity issues of the related to associated sewer pipelines.
Benefits for local residents	The proposed project is the expansion of an existing sewage infrastructure aimed at improving the quality of effluent. It will however improve the quality/efficiency of waste water treatment services in the surrounding areas. Upgrade of the current sewage infrastructure will also cater for further developments in the area thereby expedite economic growth and development in the area.

## BASIC ASSESSMENT REPORT

Impact of increase of capacity of discharge on Henley and Klip	It is accepted practice to release water purified to Special Standards into the local stream. Provision has been made in terms of frequent monitoring, preferably on quarterly basis for final effluent analysis.
Water Use licence updating and presentation to Klip Forum	The current Water use Licence will be updated as per the requirement of the National water Act, of 2008 and will be presented to the Kliprivier Forum once approved.
Access to site by construction vehicles	The proposed sites can be reached via the existing access roads and is easily accessible off the R59. During the construction phase, traffic control will be conducted (as and when required) to ensure limited impacts to local residents

*No major issues against the development have been raised by the Interested and Affected Parties consulted during the Notification period, it is hoped that additional comments will be submitted during the review of this draft BAR.*

#### 4. Comments and response report

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

#### 5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
GDARD	Ms Faith Mlambo	011 355 1974	011 355 1000	<a href="mailto:Faith.mlambo@gauteng.gov.za">Faith.mlambo@gauteng.gov.za</a>	P O Box 8769, Johannesburg, 2000
Midvaal Municipality (Environment)	Ms Suku Mali Mr JacoVerster	013 249 7057	016 360 5851	<a href="mailto:sukum@midvaal.gov.za">sukum@midvaal.gov.za</a> <a href="mailto:jakov@midvaal.gov.za">jakov@midvaal.gov.za</a>	PO Box 9, Meyerton, 1960
Emfuleni Municipality	Mr Moses Maboya	016 986-8344	016 950 5050	<a href="mailto:mosesm@emfuleni.gov.za">mosesm@emfuleni.gov.za</a>	Box 3 Vanderbijlpark Gauteng 1900 South Africa
Sedibeng Municipality	Ms Ralempotse Mosia	016 450 3240	016 427 1014	<a href="mailto:ralempotsem@sedibeng.gov.za">ralempotsem@sedibeng.gov.za</a>	PO Box 471, Vereeniging, 1930
Ekurhuleni Metropolitan Municipality	Ms Elisabeth Van der Merwe	(0) 11 999 3013 +	27 (0) 86 612 8519	<a href="mailto:Elsabeth.vdMerwe@ekurhuleni.gov.za">Elsabeth.vdMerwe@ekurhuleni.gov.za</a>	P.O. Box 25 Edenvale 1610
Department of Water Affairs	Ms Barbara Kalembo	012 3921368	012 3921359 0828968221	<a href="mailto:KalemboB@dwa.gov.za">KalemboB@dwa.gov.za</a>	Private Bag X995 PRETORIA 0001

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

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

### **6. Consultation with other stakeholders**

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

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

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

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

## SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 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. Impacts that may result from the Planning and Design, Operational, Decommissioning and Closure Phases as well As Proposed Management of Identified Impacts and Proposed Mitigation Measures

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

- Impact Assessment and Rating Methodology  
(The impact assessment for the identified potential impacts (**Appendix F**) and the methodology (**Appendix F1**) is attached in this draft BAR. The significance of impacts will be rated from Low, Medium to High where:
  - **Low:** Little influence on the receiving environment
  - **Medium:** Will have an influence on the receiving environment unless mitigated
  - **High:** Will have an influence on the receiving environment regardless of mitigation

## BASIC ASSESSMENT REPORT

### **Direct impacts: (Construction phase)**

It must be noted that the expected environmental impact will be much similar to those that are currently occurring on site and no significant additional new impacts are anticipated as part of this expansion. Various specialist assessment (**Appendix D**) has been undertaken to identify potential stability issues that may emanate from this development. The impacts are assessed and presented as follows:

<b>Waterval Works Impact Assessment</b> - <i>Impact assessment</i>				
Potential impacts:	Description	Significance rating of impacts: (without mitigation)	Proposed mitigation: Expansion and operation phase	Significance rating of impacts after mitigation:
<b>1.Impacts on vegetation</b>	There is no anticipated impact on vegetation within the site as the site is dominated by alien species and surrounding industrial areas are completely transformed	<b>Low</b>	If any floral of species of concern are observed on site, ERWAT must be contacted immediately	<b>Low</b>
<b>2.Impacts on wetlands and other water bodies</b>	Although no wetland conditions were recorded on Waterval works site, the site is located at the confluence of the Klip River and the Rietspruit	<b>Moderate</b>	<ol style="list-style-type: none"> <li>1. The applicable Water Use licences must be applied for once the relevant activity has been approved by DEA</li> <li>2. Ongoing monitoring of ground water quality must continue</li> <li>3. The existing stormwater management system must be monitored and must ensure that no stormwater or contaminated water enters the wetland area</li> <li>4. In the event that the polluted water reach the surrounding watercourses (Kliprivier and Rietspruit), the Department of Water Affairs must be notified immediately and appropriate corrective action taken; and</li> <li>5. Runoff from the Waterval works must be managed by the existing stormwater system to avoid erosion and pollution problems.</li> </ol>	<b>Low</b>

## BASIC ASSESSMENT REPORT

			6. Management of on-site water use must be strictly implemented	
<b>3.Impacts on fauna</b>	No anticipated direct impacts on fauna (reptiles and amphibian) species are expected to occur within the site. Potential amphibian species located in neighbouring wetland and Maturation ponds may be impacted if the activities e.g. stormwater and polluted water is not managed effectively	<b>Low</b>	<ol style="list-style-type: none"> <li>1. Should faunal species be observed on site, no killing of fauna will be allowed on site</li> <li>2. The natural watercourses within the vicinity of the Waterval Works must be maintained in their present condition as these areas are important for fauna species to move across the area and are likely to provide foraging and shelter for fauna on the move.</li> </ol>	<b>Low</b>
<b>4. Soils and Geology impact :</b>	Disturbance on the underlying geological condition as a result of excavation/earthworks and loss of soil is expected to during construction	<b>Medium</b>	Installation of temporary silt fences for sediment control during construction.	<b>Low</b>
<b>5. Increased soil erosion:</b>	Insufficient stormwater control measures on site may result in soil erosion in areas that are not covered by any vegetation or the buildings.	<b>Medium</b>	<ol style="list-style-type: none"> <li>1. The energy / velocity of storm water runoff should be dissipated using metre drains at appropriate intervals.</li> <li>2. The storm water system especially discharge points must be inspected and damaged areas must be repaired if required.</li> <li>3. Litter blocking storm water systems must be removed, if observed.</li> </ol>	<b>Low</b>



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<b>6. Noise impacts</b>	Trucks transporting construction materials to and from the site will potentially cause an additional noise burden to adjacent residents as well as along internal access roads.	<b>Medium</b>	<ol style="list-style-type: none"> <li>1. Noisy Activities to be limited to office hours on weekdays as far as possible.</li> <li>2. The contractor must ensure that noise levels remain within acceptable limits</li> </ol>	<b>Low</b>
<b>7.Impacts on ground and surface water:</b> Groundwater contamination due to waste water treatment activities.	<ul style="list-style-type: none"> <li>• Seepage from the Waste water infrastructure can contaminate wetland and underground water sources</li> <li>• Hydrocarbon leakages from plant vehicles and poor management of sources of hydrocarbon leakages has a potential to pollute underground and surrounding resources</li> </ul>	<b>Medium</b>	<ol style="list-style-type: none"> <li>1. Contaminated water from the holding dams must be monitored for leakages</li> <li>2. Ground and surface water monitoring must continue</li> <li>3. Drainage shall be controlled to ensure that runoff from the site will not culminate in offsite pollution or result in damage to surrounding properties.</li> <li>4. Construction/Plant machinery and vehicles are to be maintained in good working order, to reduce the probability of leakage of fuels and lubricants.</li> <li>5. Oil residue must be treated with oil absorbent such as Drizit or similar and this material removed to a licensed waste disposal site.</li> </ol>	<b>Low</b>
<b>8.Impacts on stormwater:</b>	The accumulation of uncontrolled stormwater.	<b>Medium</b>	<ol style="list-style-type: none"> <li>1. The existing storm water system especially discharge points must be inspected and damaged areas must be repaired if required.</li> <li>2. Proper stormwater control must continue on all areas within the site to avoid contamination of surrounding areas.</li> <li>3. Drainage shall be controlled to ensure that runoff from the site will not culminate in offsite pollution or result in damage to properties downstream of any stormwater discharge.</li> <li>4. Good housekeeping should be implemented on site to prevent</li> </ol>	<b>Low</b>

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			surface and stormwater pollution	
<b>9.Impact on dust and air quality:</b>	<p>Sources of air emissions associated with the proposed expansion will include:</p> <ul style="list-style-type: none"> <li>• Unpleasant odours due to effluent discharge</li> <li>• Wheel generated dust from unpaved roads</li> </ul> <p>It is the conclusion of the air quality study that the construction of the new works would have very low negative impacts during construction. The impacts will be generally from construction related dust emissions, but these will be much localized in nature and can successfully be mitigated.</p>	<b>Medium to Low</b>	<ol style="list-style-type: none"> <li>1. Implementation of certain emission reduction controls and operational controls may reduce emissions/odours from wastewater treatment works</li> <li>2. Wetting of roads during construction when dust problems arise;</li> <li>3. Maintenance of vehicles and other driven machinery in use to ensure that no smoke is emitted from exhausts;</li> <li>4. Prevention of burning of cleared vegetation and wastes/refuse;</li> <li>5. Regular training to all staff including managers, operational staff and machine operators in various techniques to minimise dust emissions</li> <li>6. A continuous dust monitoring process needs to be undertaken during expansion.</li> </ol>	<b>Low</b>
<b>10.Impact on visual and aesthetic quality:</b>	<p>The proposed expansion will not cause a significant visual change as the proposed Module will be similar to the existing ones on site.</p>	<b>Low</b>	<ol style="list-style-type: none"> <li>1. Locating the proposed expansion as per the proposed design</li> <li>2. Ensuring that the Waterval Works design features are aesthetically well designed</li> <li>3. Regular maintenance and the general surrounds of the property (gardens, access roads, etc.) can prevent the visual impact of degradation and perceived poor management.</li> <li>4. Ensure good housekeeping is implemented at all times.</li> <li>5. Keep the property neat and litter free at all times and maintain the landscaped areas.</li> </ol>	<b>Low</b>

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<b>11. Impact on socio-economics:</b>	Influx of workers in the area may raise concerns from neighbouring residents	<b>Medium</b>	All adjacent landowners must be informed of the expansion processes prior to commencement.	<b>Low - positive</b>
<b>12. Impacts on traffic and local roads :</b>	Traffic increase from the traffic that will be delivering materials in and out of site	<b>Medium</b>	<ol style="list-style-type: none"> <li>1. Post speed limited in proximity to the main access road</li> <li>2. Roads should be adequately maintained.</li> <li>3. Adequate signage should be provided and adhered to.</li> </ol>	<b>Low</b>
<b>13. Health and Safety impacts</b>	Impacts/injuries to humans entering the site unnoticed	<b>Medium</b>	<ol style="list-style-type: none"> <li>1. Regular maintenance of the fence around the Waterval Works must be undertaken ensure that no authorised people enter the area.</li> <li>2. Warning signs would have to be posted to alert residents to possible dangers.</li> <li>3. Safety clothes and equipment must be worn at all times.</li> <li>4. Strict adherence by drivers to speed limits should be enforced</li> <li>5. Disciplinary action for reckless driving should be implemented</li> <li>6. Heavy vehicles should limit the use of local roads during peak traffic</li> </ol>	<b>Low</b>

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<b>14.Impact on land use</b>	The sewage infrastructure may limit development or change of land use of the proposed site.	<b>Low</b>	<ol style="list-style-type: none"> <li>1. Ensuring that land is appropriately rezoned</li> <li>2. The construction camp should be sited away from any sensitive environments.</li> </ol>	<b>Low</b>
<b>15.Impacts on unknown cultural and heritage resources</b>	No objects of heritage value are expected to be exposed from the expansion as no dredging or construction related activities will be undertaken. Therefore, the potential for impacts to occur is considered to be very low.	<b>Low</b>	<ol style="list-style-type: none"> <li>1. Site personnel must be alert and inform local Council should they come across any features of heritage value and must cease expansion activities immediately</li> <li>2. No heritage feature can be removed, destroyed and/or interfered with on site without the permission of an accredited archaeologist</li> </ol>	<b>Low</b>
<b>Operational phase impacts</b>				
<b>Air Quality (Odour)</b>	Sludge handling and treatment may increase the odour levels during the operational phase	<b>Medium</b>	<ol style="list-style-type: none"> <li>2. Ensuring that odour control is adequately provided for in the design and specification of the upgrade.</li> <li>3. Minimisation of the surface area exposed to wind erosion during operation;</li> <li>4. Planting of grass immediately after construction where soil has been exposed;</li> <li>5. Ensuring adequate odour management measures are adhered to during operation of the Works;</li> <li>6. Maintaining a complaints register during the operating phase of the project</li> <li>7. Regular maintenance and operations of the wastewater treatment plant to reduce odour</li> <li>8. Encouraging the implementation of a community monitoring committee for the Waterval Works;</li> <li>9. Registering and investigating of all complaints and if possible address any operational or maintenance aspect that result in unacceptable high odour level.</li> </ol>	<b>Low</b>

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			10.	
<b>Surface and Ground water contamination</b>	Pollutants through spillage of the sludge could impact on underground and surrounding water sources	Medium	<ol style="list-style-type: none"> <li>1. Appropriate design of sewerage reticulation system to ensure competent operation of sewage treatment and separated from consumable water system.</li> <li>2. Conduct regular inspections of infrastructure at intervals so as to identify any potential failure of infrastructure and repair immediately</li> <li>3. Develop a contingency plan for periods of load shedding that will prevent the release of raw sewage into the adjacent watercourses; and</li> <li>4. Identify mechanisms for staff training, evaluation and retention to ensure no loss of skills and knowledge regarding the treatment process</li> <li>5. The construction camp (should be sited away from any sensitive environments.</li> </ol>	Low
<b>Soil contamination</b>	Soil contamination due to effluent spillages	Medium	The plant operator shall adopt appropriate spillage recovery procedure to void soil contamination due to effluent spillages	Low
<p><b>Decommissioning phase</b> - <i>The closure phase for the Waterval expansion is anticipated to be within 30 - 40 years from development of the facility. Should the facility be decommissioned it is anticipated that the structures will be dismantled and removed and a rehabilitation plan (removal of all hydrocarbons, waste infrastructure components and provision of recycling plans) approved by the relevant authorities will be implemented.</i></p> <p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>• Noise and air quality impacts from vehicles delivering construction materials</li> </ul> <p><b>Cumulative impacts:</b></p> <p><i>Visual Cumulative impacts will emanate from the construction activities as there are already similar activities on site.</i></p>				

A complete impact assessment in terms of Regulation 22(2)(i) of GN R.543 must be included as Appendix F.

### 2. Environmental Impact Statement

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

*The proposed expansion of the Waterval works is preferred from the environmental perspective as the expansion occurs within a transformed area zoned for waste water treatment. In general, the proposed Waterval Works are not located in a sensitive environment; no direct impact on ecological and hydro geological environment is expected. There are no critical biodiversity areas or ecological process areas that traverse the site. No wetland conditions will be directly impacted by the expansion.*

*Based on the summary of environmental observations presented, it is a conclusion of this BA that the proposed project will have moderate to low impacts on the bio-physical environment, all of which can be fully mitigated and managed, and where possible prevented. Updating the current Water use licence as per National Water Act, No 36 of 1998 and maintenance of the site to avoid impact on the surrounding natural environment are some of the key mitigation measures that must be implemented during the expansion.*

*This report is intended to offer an objective assessment of the potential environmental impacts and issues / concerns raised during the BA process. The impact assessment section of this report indicates that the most significant environmental impacts associated with the proposed development can be effectively mitigated to have a low significance impact rating.*

*The proposed Waterval Works upgrade are strategically required to meet the demands of anticipated future increase in sewage wastewater quantities that would result from expected developments in Midvaal and Ekurhuleni Municipality. Other significant benefits include the improved quality of treated effluent which is being discharged into the surrounding area. In summary the proposed upgrade of the Waterval Works is associated with significant biophysical benefit associated with improving the quality of treated effluent discharged to the environment.*

*The key decision making factors which the EAP believes need to be kept in mind by the authorities in deciding on the sustainability of their decision, are as follows:*

- The proposed Waterval Works upgrade are strategically required to meet the demands of anticipated future increase in sewage wastewater quantities that would result from expected developments in Ekurhuleni/Midvaal Municipality;*
- I&APs have shown no interest in the proposed development which suggests that the rights and interests of the public are unlikely to be affected by the proposed upgrade.*
- The proposed development is environmentally suitable insofar as both are associated with impacts of low and very low significance (assuming the recommended mitigation measures are implemented).*

*Potential environmental problems that have been identified as part of this BA include air pollution impacts such as dust emissions during construction phase. Such may not only affect construction workers but also to people living and working in the local neighbourhood. Odour nuisances in the vicinity of the Waterval Works are expected to occur during the operational phase, which will be more similar or even lower to the current conditions as the upgrade will also improve in the management of odour within the Works.*

*The significance is expected to be low as the proposed development occurs in an area zoned for waste water treatment services. Potential ground water impacts during construction and operational phases can be effectively mitigated through the implementation of environmental standards of best practice, management of all potential ground water contaminants, bottom lining of all sewage infrastructure that has a potential to leak into the ground. With the correct management, mitigation and adherence to best practice principles these potential pollution events can be avoided.*

*Responsible environmental management will be required on site during the planning, construction and operational phases of the development. These management measures should be guided by the Environmental Management Program (**Appendix G**) and the Operational Plan (**Appendix G1**) and will be updated with additional conditions from the Environmental Authorities.*

**Alternative 1**

N/A

**Alternative 2**

N/A

**No-go alternative (compulsory)**

*The No-go option implies that the Project does not proceed, and will thus comprise of ERWAT not going ahead with the expansion of the Waterval Works. Ideally this would be the preferred alternative as the status quo of the environment remains unchanged, however due to the anticipated future developments in the Ekurhuleni and Midvaal local municipalities that will require adequate sewer treatment in the area this alternative is not feasible. Should ERWAT keep the current capacity of the treatment works, it is highly likely that any anticipated future developments will function without adequate sewage infrastructure.*

- **Direct impacts**

- ERWAT will not be able to provide adequate sewage treatment for future developments.
- Limited development and employment opportunities will be created as there is no construction phase).

- **Indirect Impacts**

- Local suppliers and contractors will not benefit from the business opportunities relating to supply and delivery of materials
- No new business and industrial ventures due to lack of adequate waste water treatment infrastructure

**SECTION E. RECOMMENDATION OF PRACTITIONER**

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

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

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.

This BAR has provided a comprehensive assessment of the potential environmental impacts associated with the proposed upgrade of the Waterval Works. These impacts have been identified by the EIA team (including specialists) and I&APs. The key findings of the BA are discussed in this Report. In general, the proposed development will have an impact of low significance provided that there is effective application of the mitigation measures proposed in this BAR and the EMPr. The majority of these impacts are easily mitigated and can be reduced to lower significance through appropriate design and mitigation measures. No unacceptably impacts of unacceptably high significance are foreseen once proper mitigation measures have been implemented. The findings of the specialists that were involved are briefly presented as follows:

- All the specialists that were involved (fauna, flora, wetland, air quality, heritage, geotechnical and geohydrological), concluded that the proposed expansion of the Waterval Works is unlikely to have significant negative impacts on the receiving environment as the proposed will be located in an area that is already zoned for Waste water treatment. However, potential impacts should still be managed to prevent cumulative impacts as set out in the mitigation measures in this report.
- Although the specialists involved in the project concluded that the site is suitable for the expansion, mitigation measures in the EMPr (**Appendix G**) should be strictly adhered to.

***Therefore based on the specialist findings undertaken for the Waterval Works site, it is a recommendation of this Basic Assessment that the Proposed expansion of the Waterval Works be authorised. It is therefore recommended that the environmental authorities authorise the development subject to the following conditions:***

- Compliance with the mitigation measures outlined in this BA report and EMPr;
- Ground and surface water monitoring ;
- ERWAT must ensure that they comply with the applicable legislation, regulatory and permit requirements from the Local and District Municipality, Department of Water Affairs, Department of Health during the construction and operational phases. It is essential that the all applicable regulations are adhered to as this will safe guard ERWAT against litigation issues as a result of potential health and safety risk issues that may arise during both Construction and operational issues. The odours that may arise from the Waterval Works will obviously be of concern to surrounding residents and/or users of the area, the onus will therefore rest on ERWAT in terms of strictly adhering to the legal compliance requirements.
- Identifying and implementing measures that reduce the possibility of increase in odour, levels, potential ground water contamination, impacts on Kliprivier and Rietspruit,



## BASIC ASSESSMENT REPORT

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malfunctions or operational problems occurring within the Works;

- As recommended by the Air Quality Assessment, applicant ERWAT should commission a baseline survey of ambient air quality and odours from the wastewater treatment plant before the upgrade and after the commissioning of the upgrade.
- The baseline survey should include a summer and winter survey around the Waterval Works and at sensitive receptors near the Waterval Works.
- Instituting an onsite complaints register to ensure the timeous response to complaints and also to keep records of where and when odour problems are experienced;
- Avoiding impacts on the surrounding water courses during construction and operation;
- Public safety must be considered during planning and construction site layout;
- The appointed Contractor must adhere to OHSA with regards to noise levels and protective equipment.
- Neighbouring property owners must be informed when the construction commences; and
- Specifications detailed in the EMPr must be adhered to and monitoring during constructing and operational phases be undertaken.

Compliance with all legal requirements in relation to environmental management and conditions of the authorisation issued by DEA.

Is an EMPr attached?

**YES**

NO

The EMPr must be attached as Appendix G.

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

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

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

Nkhensani Khandlhela

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

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

\_\_\_\_\_  
DATE

**SECTION F: APPENDIXES**

The following appendixes must be attached:

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports (including terms of reference)

*Appendix D1: Geohydrological Assessment*

*Appendix D2: Aquatic Assessment*

*Appendix D3: Ecological (Flora and Fauna) Assessment*

*Appendix D4: Air Quality Assessment*

*Appendix D5: Heritage Assessment*

Appendix E: Public Participation

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: Specialist's declaration of interest

Appendix J: Additional Information