

**aurecon**

**Project:** Mabopane Cemetery Expansion  
**General Authorisation in terms of**  
**Section 21 g of the NWA**

**Reference:** 111367  
**Prepared for:** City of  
Tshwane  
**Revision:** 1  
28 May 2015

# Document Control Record

Document prepared by:

Aurecon South Africa (Pty) Ltd  
 Aurecon Centre, 4 Daventry Street  
 Lynnwood Manor  
 Tshwane

T 012 427 2170  
 F Company Fax  
 E Roshantha.nanooolal@aurecongroup.com  
 W www.aurecon.com

A person using Aurecon documents or data accepts the risk of:

- a) Using the documents or data in electronic form without requesting and checking them for accuracy against the original hard copy version.
- b) Using the documents or data for any purpose not agreed to in writing by Aurecon.

Document control							aurecon	
Report Title		<b>General Authorisation in terms of Section 21 g of the NWA</b>						
Document ID		Project Number			111367			
File Path		P:\Projects\111367 Mabopane Cemetery Expansion BAR\03 PRJ Del\6 REP\General Authorisation\Mabopane Cemetery2.docx						
Client		<b>City of Tshwane</b>		Client Contact				
Rev	Date	Revision Details/Status		Prepared by	Author	Verifier	Approver	
0		Draft IWULA		R Nanooolal	R Nanooolal	R Heydenrych	BHJS	
Current Revision		1						

Approval			
Author Signature		Approver Signature	
Name	<b>Roshantha Nanooolal</b>	Name	<b>BHJ Smit</b>
Title	<b>Environmental Practitioner</b>	Title	<b>Technical Director</b>

# Mabopane Cemetery Expansion

Date | 28 May 2015  
Reference | 111367  
Revision | 1

Aurecon South Africa (Pty) Ltd  
Aurecon Centre, 4 Daventry Street  
Lynnwood Manor  
Tshwane  
T 012 427 2170  
F Company Fax  
E [Roshantha.nanoal@aurecongroup.com](mailto:Roshantha.nanoal@aurecongroup.com)  
W [www.aurecon.com](http://www.aurecon.com)

## SYNOPSIS

City of Tshwane has commissioned General Authorisation (GA) application process for the impacts associated with the proposed activity of a cemetery on the watercourse (groundwater) within the City of Tshwane Metropolitan Municipality (CoTMM) within Gauteng. Aurecon South Africa (Pty) Ltd has been appointed as independent consultant to undertake the GA in terms the National Water Act, 1998 (Act No. 36 of 1998) [NWA] and General Authorisation.

The proposed activity will be located in the A23K quaternary catchment of the Crocodile (West) and Marico Water Management Area (WMA) and the Apies/Pienaars sub catchment.

Various alternatives for the location and technology of the expansion of the cemetery were considered in order to minimise environmental impacts while being economical efficient. The current proposed position serves as the best option.

This document provides detailed information in support of a GA 169 of 2013 for the water use as defined in the NWA (Act 36 of 1998), which are associated with the proposed activity:

- S21 (g) Disposing of waste in a manner that may detrimentally affect a water resource (impact on groundwater).

Ground water resources will potentially be affected by the proposed development. The environmental authorisation process in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA] for the proposed project is being undertaken by Aurecon (Pty) Ltd. The Gauteng Department of Agriculture and Rural Development (GDARD) has acknowledged the application for the proposed listed activity in terms of NEMA and has issued a reference number (14/12/16/3/3/1/988). Refer to **Appendix A** for the Draft Basic Assessment Report (BAR) prepared in support of the application for environmental authorisation of the NEMA listed activities.

# Contents

<b>1</b>	<b>INTRODUCTION</b>	<b>10</b>
1.1	Background	10
1.2	Locality	10
1.3	Regulatory framework	11
1.4	Purpose of this report	12
<b>2</b>	<b>PROJECT DESCRIPTION</b>	<b>13</b>
2.1	Project description	13
2.2	Details of the Applicant, Consultant and Landowners	13
<b>3</b>	<b>BASELINE ENVIRONMENTAL DESCRIPTION</b>	<b>15</b>
3.1	Topography and climate	15
<b>4</b>	<b>WATER USE</b>	<b>27</b>
4.1	Summary of water uses	27
4.2	Motivation for water uses	29
<b>5</b>	<b>IMPACT ASSESSMENT</b>	<b>30</b>
5.1	Impact assessment methodology	30
<b>6</b>	<b>MONITORING PROGRAMME</b>	<b>34</b>
<b>7</b>	<b>MOTIVATION FOR LICENCE APPLICATION</b>	<b>35</b>
7.1	Motivation in terms of Section 27 of the NWA	35
7.2	Information submitted in support of the licence application	37
<b>8</b>	<b>AUTHORITY AND PUBLIC CONSULTATION</b>	<b>38</b>
8.1	Consultation with Department of Water and Sanitation	38
8.2	Public participation process	38
8.3	Comments/issues received	38
<b>9</b>	<b>CONCLUSIONS AND RECOMMENDATIONS</b>	<b>39</b>
<b>10</b>	<b>REFERENCES</b>	<b>40</b>

# Appendices

## Appendix A.1

Environmental Authorisation and Acknowledgement

## Appendix A.2

Draft Basic Assessment Report

## Appendix B.1

Locality Map

## Appendix B.2

Water Uses Map

## Appendix C.1

Technical Designs Drawings

## Appendix C.2

Construction Methodology

## Appendix C.3

Construction EMP

## Appendix D.1

DW758

## Appendix D.4

DW767

## Appendix D.4

DW901

## Appendix E.1

Title Deed Summaries

## Appendix F

Proof of Payment

## Appendix G.1

Ecological Study

## Appendix G.2

Geohydrological assessment

## Appendix H.1

Environmental Management Plan

## Appendix I.1

Correspondence with the DWS

## Appendix I.2

Proof of Newspaper Advertisement

## Index of Figures

Figure 1: Regional location of the Mabopane Cemetery	10
Figure 2: Properties affected Mabopane Cemetery	14
Figure 3: An extract of the geological map of the investigated area (Sheet 2528 Pretoria)	15
Figure 4: Location of Mabopane Cemetery within the A23J quaternary catchment	17
Figure 5: Combretum woodland	21
Figure 6: Open savannah	21
Figure 7: Grassland savannah	21
Figure 8: Habitat units	21
Figure 9: Thornveld	21
Figure 10: Low shrubland	21
Figure 11: Closed veld	21
Figure 12: Transformed area	22
Figure 13: Sand mining	22
Figure 14: Illegal dumping	22
Figure 15: Sensitivity	22
Figure 16: Water uses	28

## Index of Tables

Table 1: Details of properties on which water uses occur	13
Table 1. Details of boreholes identified during hydrocensus	18
Table 2. Coordinates of the geophysical traverses and drilling targets	19
Table 3. Chemical parameters compared to SANS 241-1:2011 (edition 1) drinking water standards	19
Table 5: Summary of water uses for the Mabopane Cemetery expansion	27
Table 6: Ranking scales for assessing impact consequence	31
Table 7: Impact assessment for the Section 21 water uses	32
Table 8. Monitoring boreholes to be included into the monitoring program	34
Table 9. Proposed monitoring requirements	34
Table 10: Summary of interaction with Department of Water and Sanitation	38

## Abbreviations used in the report:

<b>AEP</b>	Annual Exceedance Probability
<b>ADU</b>	Avian Demography Unit
<b>BAR</b>	Basic Assessment Report
<b>bgl</b>	below ground level
<b>CBD</b>	Central Business District
<b>DEA</b>	Department of Environmental Affairs
<b>DM</b>	District Municipality
<b>DMR</b>	Department of Mineral Resources
<b>DWS</b>	Department of Water and Sanitation
<b>EA</b>	Environmental Authorisation
<b>EC</b>	Electrical Conductivity
<b>EIA</b>	Environmental Impact Assessment
<b>EMPR</b>	Environmental Management Programme
<b>EMPr</b>	Environmental Management Program Report
<b>GN</b>	Government Notice
<b>HDSA</b>	Historically Disadvantaged South African
<b>HDPE</b>	High-density Polyethylene
<b>I&amp;APs</b>	Interested and Affected Parties
<b>IWULA</b>	Integrated Water Use License Application
<b>IWWMP</b>	Integrated Water and Waste Management Plan
<b>KZN</b>	KwaZulu-Natal
<b>LM</b>	Local Municipality
<b>masl</b>	meters above sea level
<b>mamsl</b>	metres above mean sea level
<b>MAR</b>	Mean Annual Runoff
<b>MTPA</b>	Million Tons Per Annum
<b>MU</b>	Management Unit
<b>MW</b>	monitoring wells
<b>NEMA</b>	National Environmental Management Act, 1998 (Act No. 107 of 1998)
<b>NEM:WA</b>	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
<b>NWA</b>	National Water Act, 1998 (Act No. 36 of 1998)
<b>PES</b>	Present Ecological State
<b>PP</b>	public participation
<b>PRECIS</b>	Pretoria Computerised Information System
<b>QoLS</b>	Quality of Life Survey
<b>RWQO</b>	Resource Water Quality Objective



<b>SASS5</b>	South African Scoring System (Ver. 5)
<b>SOC</b>	State-owned Company
<b>SP</b>	Significance Points
<b>SS</b>	Suspended Solids
<b>SWL</b>	Static Water Level
<b>VM</b>	Virtual Museum
<b>WMA</b>	Water Management Area

# 1 INTRODUCTION

## 1.1 Background

Aurecon South Africa (Pty) Ltd has been appointed by City of Tshwane Metropolitan municipality (COTMM) for authorisation of the Mabopane Cemetery in terms of the National Water Act (Act 36 of 1998).

The COTMM is proposing the expansion of the existing cemetery on a remaining extent of farm Mabopane from 18.3 hectares to 31.8 hectares, with the new expansion being 13.5 hectares

## 1.2 Locality

The Mabopane Cemetery is located in the suburb of Mabopane, 60 km north of Pretoria on Farm Mabopane 702-JR in Mabopane.

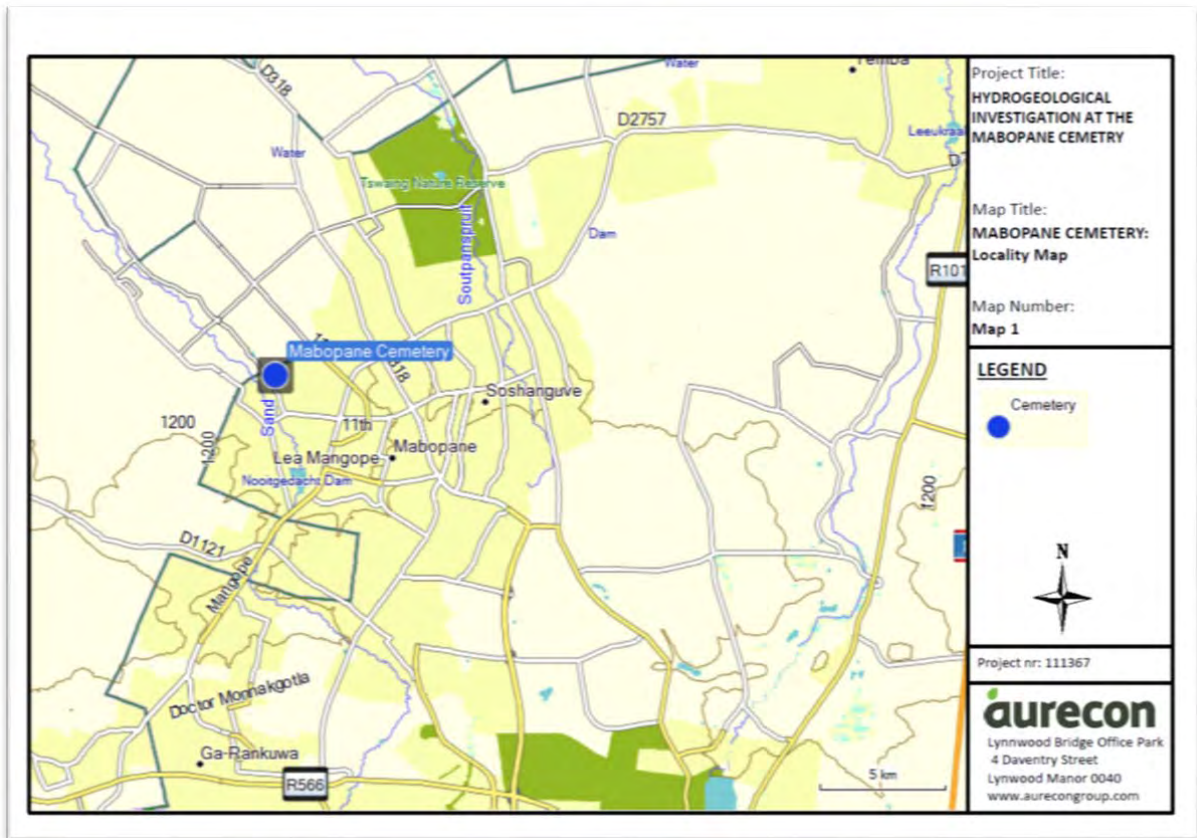


Figure 1: Regional location of the Mabopane Cemetery

## 1.3 Regulatory framework

### 1.3.1 National Water Act, 1998 (Act 36 of 1998)

Water uses are defined in the National Water Act, 1998 (Act No. 36 of 1998) (NWA) and include the following activities as described in Section 21 of the NWA:

- (a) Taking water from a water resource;
- (b) Storing water;
- (c) Impeding or diverting the flow of water in a watercourse;
- (d) Engaging in a stream flow reduction activity contemplated in section 36;
- (e) Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
- (f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- (g) Disposing of waste in a manner that may detrimentally affect a water resource;
- (h) Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- (i) Altering the bed, banks, course or characteristics of a watercourse;
- (j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- (k) Using water for recreational purposes.

In terms of Section 22(1), a person may only undertake the abovementioned water uses if it is appropriately authorised:

A person may only use water

- (a) without a licence
  - (i) if that water use is permissible under Schedule 1 (of the NWA);
  - (ii) if that water use is permissible as a continuation of an existing lawful use; or
  - (iii) if that water use is permissible in terms of a general authorisation issued under section 39;
- (b) if the water use is authorised by a licence under this Act; or
- (c) if the responsible authority has dispensed with a licence requirement under subsection (3).

The authorisations required for the Mabopane Cemetery expansion in terms of the abovementioned sections of NWA is discussed in detail in section 4.

Details of the discussions with the Department of Water and Sanitation (DWS) on the water use licence requirements for the proposed activity is provided in section 8.1.

## 1.4 Purpose of this report

This document serves as an management report for all the Section 21 water uses in terms of the NWA that are associated with the registration of the boreholes.

It therefore:

- Provides detail on the water uses associated with the boreholes (**Section 4**);
- Includes proof of payment to the DWS for processing of the IWULA (**Appendix F**);
- Includes the completed application forms for the registration of water uses (refer to **Appendix D**); and
- Contains all available information so that DWS full aware of the requirement and need of the boreholes

## 2 PROJECT DESCRIPTION

### 2.1 Project description

The proposed extension is approximately in area. The proposed site is currently operating as a cemetery however the burial site has reached full capacity – resulting in the need for expansion. The proposed site of expansion measures approximately 11.83 hectares in extent. The expansion will extend approximately 6.5 hectares north and 5.3 hectares south of the existing cemetery.

### 2.2 Details of the Applicant, Consultant and Landowners

#### 2.2.1 Consultant responsible for compilation of IWULA

Aurecon South Africa (Pty) Ltd  
Aurecon Centre, 4 Daventry Street  
Lynnwood Manor  
Tshwane  
0081  
Aurecon Representative: Roshantha Nanoolal

#### 2.2.2 Name and address of the Water Use License Applicant

City of Tshwane – Environmental Management  
P.O. Box 1454,  
Pretoria,  
0001  
Contact person: Livhuwani Siphuma  
Tel: 012 358 5766; E-mail: LivhuwaniS@tshwanw.gov.za

#### 2.2.3 Details of landowners

The location of the proposed expansion is the Remaining extent of the farm Mabopane 702 JR. The properties on which water uses associated with the short term coal storage will take place are shown in **Figure 2** and listed in

Copies of the title deeds are attached in **Appendix E**.

Table 1: Details of properties on which water uses occur

WU REF	WATECOURSE	PROPERTY	TITLE DEEDS
W1-W6	Ground Water	Farm Mabopane 702-JR in Mabopane	T22316/2009



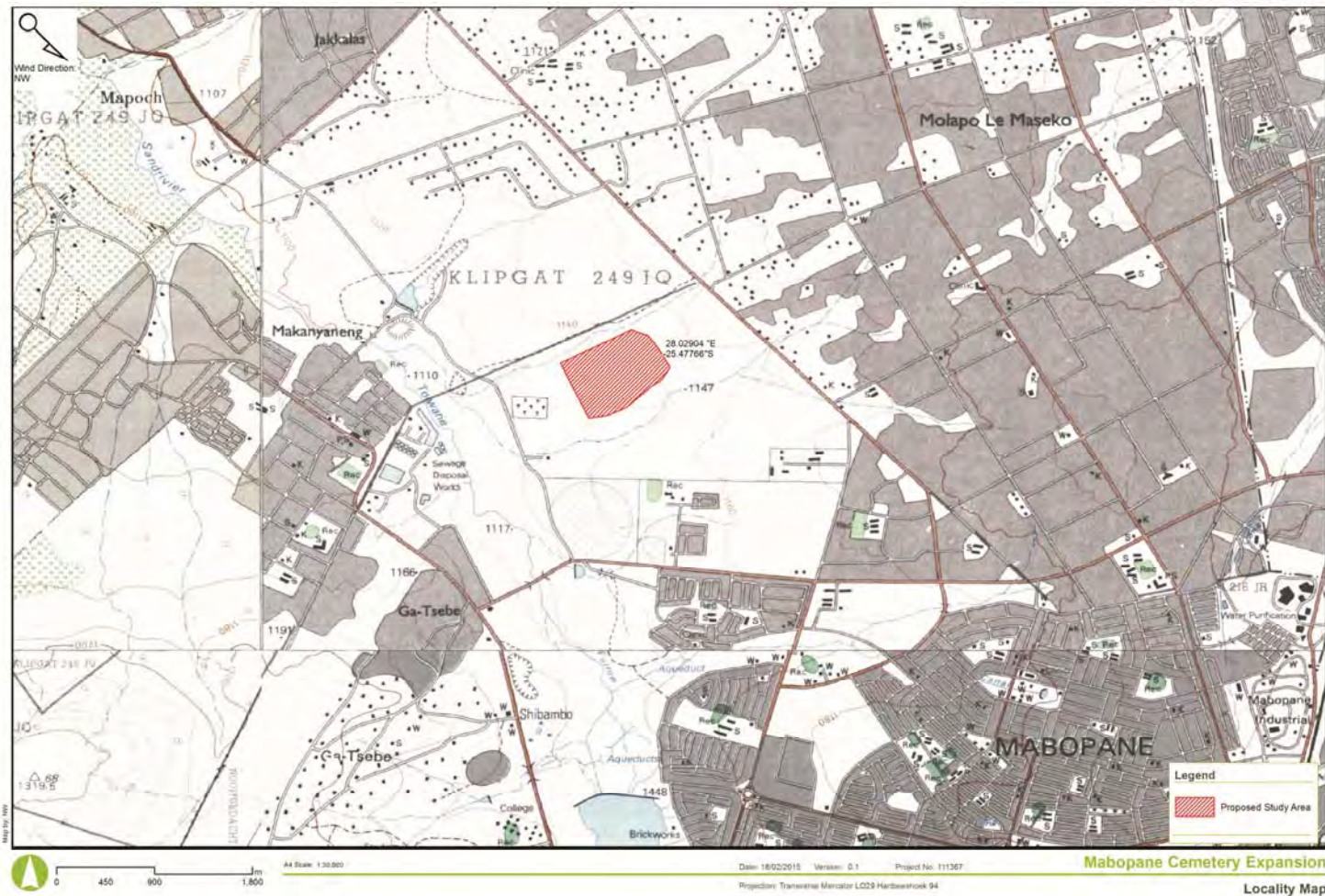


Figure 2: Properties affected Mabopane Cemetery

# 3 BASELINE ENVIRONMENTAL DESCRIPTION

## 3.1 Topography and climate

### 3.1.1 Topography

The cemetery is located on a watershed between three local drainages. The majority of the drainage is towards the Sand River towards the south west of the site. Both the south-eastern as well as the northern boundary of the cemetery site is drained by tributaries of the Sand River. Local drainage from the cemetery will be in a south-westerly direction (0.03 or 3%) towards the Sand River which flows in a north westerly direction. The Sand River flows into the Pienaars River, which eventually flows into the Crocodile River.

### 3.1.2 Geology

According to the 1:250 000 geological map (2528 Pretoria) the cemetery is underlain by grey to pink coarse grained Nebo granite of the Lebowa Granite Suite, Bushveld Complex (Map 2, Appendix A). No linear structures or faults in close proximity to the cemetery.

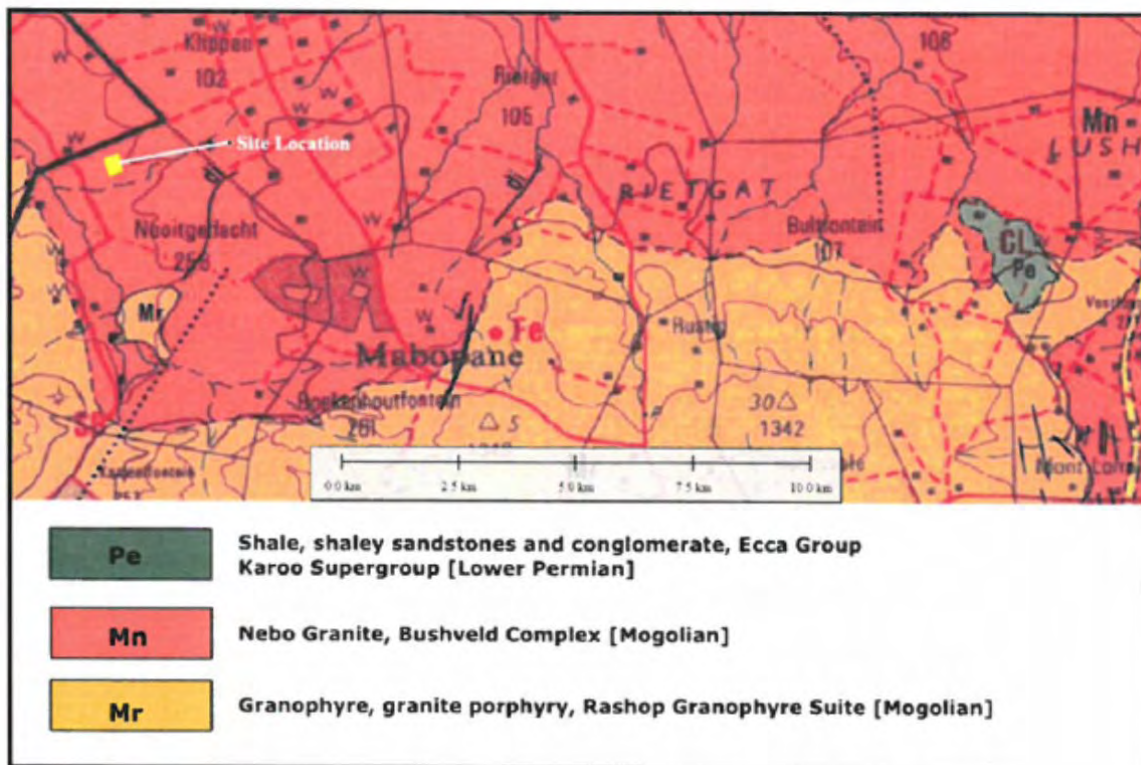


Figure 3: An extract of the geological map of the investigated area (Sheet 2528 Pretoria)

### 3.1.3 Regional climate

Mabopane normally receives about 694mm of rain per year, with most rainfall occurring during summer. It receives the lowest rainfall (3mm) in June and the highest (113mm) in February. The midday temperatures for Mabopane are on average 30°C in January. The region is the coldest during July when the mercury drops to 5°C on average during the night.

The region is classified as having a climatic N-value (after Weinert, 1980) of about 2.5, which indicates a more humid part of the country. Chemical weathering is predominant in this part of the country..

### 3.1.4 Water Management Area

The proposed development falls within the Crocodile West Marico WMA Gauteng, the Crocodile (West) catchment (secondary catchment) is one of the most developed catchments in the country. The catchment is characterised by the sprawling urban and industrial areas of northern Johannesburg and Pretoria, extensive irrigation downstream of Hartbeespoort Dam and large mining developments north of the Magaliesberg. Irrigation is the single largest water user in the Crocodile River catchment using approximately 375,5 m<sup>3</sup>/annum (DWA 2008).

Due to the extensive developments and high level of human activity in the catchment, water use in the catchment exceeds the water available from the local sources. Most of the water used in the catchment is therefore supplied from the Vaal River system via Rand Water, mainly to serve the metropolitan areas and some mining developments. This results in large quantities of effluent from urban and industrial users, most of which is discharged to the river system after treatment, for re-use downstream. In many of the streams and impoundments, water quality is severely compromised by the proportionate large return flows.

There are three power stations in the Crocodile River catchment: Kelvin in the Upper Crocodile sub-catchment and Pretoria-West and Rooiwal in the Apies-Pienaars sub-catchment. The water requirements of the Kelvin, Pretoria-West and Rooiwal power stations are 11 million m<sup>3</sup>/annum, 6 million m<sup>3</sup>/annum and 17 million m<sup>3</sup>/annum respectively.

#### **The Apies/Pienaars sub catchment (A23K)**

A major part of this area is densely populated with the City of Tshwane (Pretoria) situated in the higher lying southern portion of the sub-catchment. The bulk of the water requirements of this area are supplied by Rand Water, sourced from the Vaal River System, although significant quantities are also supplied from groundwater and from local sources. Water infrastructure in the existing urban areas of Mabopane, Hammanskraal and Temba, to the north of Pretoria is being upgraded which will have an impact on water usage in this area. Irrigation in this sub-area is significant, with an estimated 67 km<sup>2</sup> of irrigated crops. The same situation exists in the Apies/Pienaars sub-area as in the upper Crocodile, with increasing return flows resulting in projected surpluses in future. The difference here though is that the return flows become available in the Apies and Pienaars Rivers as opposed to the Crocodile which receives the return flows from the Upper Crocodile sub-area. Also, in the case of the Apies/Pienaars system, some of the surplus has already been allocated for improvement and expansion of the water supply to the areas north of Pretoria referred to above. The possibility of transferring the surpluses derived from return flows to the Western Highveld area in the Olifants WMA is also an option which is currently being investigated. It is important to ensure that increasing river flows due to return flows are not taken up by riparian irrigators, without first carefully considering alternative uses of this water.

#### **C-Plan**



According to the GDACE C plan there are no sensitive ecological features on site. According to the C-Plan non perennial rivers are present which play an important part in the groundwater dynamics, nutrient cycle and wildlife dispersal

### 3.1.5 Water Quality

According to the Internal Strategic Perspective of the Crocodile River (West Catchment) Report compiled by Department of Water and Sanitation in 2004, the Apies/Pienaars Catchments receives effluent discharges from Pretoria and the whole catchment experiences poor water quality. All dams in the catchment are eutrophic. The Temba, Klipdrift and Walmansthal treatment plants, which treat water from these catchments for potable use, make use of a sophisticated process that removes taste and odour. Although expensive, this process is very necessary. The salt content of the groundwater is elevated in some of the areas north of Pretoria in catchments A23F and A23J where conductivities above 150mS/m occur naturally in Karoo strata, especially close to the granite contact. Fluoride values >1.5mg/l are locally present in the groundwater in the granitic area east of the Klipvoor Dam.



Figure 4: Location of Mabopane Cemetery within the A23J quaternary catchment

### 3.1.6 Ground Water

According to the geohydrology study conducted by Aurecon (Pty) Ltd, groundwater occurrence within the granite of the Lebowa Granite Suite is associated with deeper weathered zones while faults, fracture zones and dyke contact zones represent a less common mode of occurrence. The groundwater yield potential is classed as low since 82% of boreholes on record produce less than 2 l/s. The depth to groundwater level is generally shallow and seldom exceeds 15m below surface. The comparatively low storage of the granitic rocks is reflected in the appearance of numerous springs and seepages resulting from a rise in groundwater rest levels following rainfall and associated recharge events.

The general suitability of the groundwater for any use is indicated by the average EC value of 60 mS/m and a mean pH value of 7.6.

Due to the cemetery's close proximity to the Sand River, a relatively shallow water table can be expected. This was confirmed by the water level measured in the newly drilled monitoring borehole as well as the existing production borehole (<7mbgl).

It can be assumed that the regional groundwater flow direction will emulate to local topography. Groundwater flow will thus be in a south westerly direction towards the Sand River.

Due to nature of cemeteries and the associated disturbance of the vadose zone due to grave digging, the vertical as well as the horizontal hydraulic conductivity (K) is altered. This results in high K-values meaning that natural recharge in the area is higher than normal and that contaminants migrate at a higher rate through this disturbed profile.

### 3.1.7 Hydrocensus

A hydrocensus was carried out as part of the Geohydrology assessment. The hydrocensus extended to a distance of ~1km from the cemetery, except where a river or a surface water body exists. The hydrocensus did not extend past such a feature as surface water bodies are hydraulically connected to an aquifer, acts as a constant-head boundary and a groundwater pollution plume would theoretically not extend past a constant head boundary.

One borehole was found and is equipped with a submersible pump. This borehole is located on the premises of the Mabopane Cemetery and is used for domestic purposes by its staff.

Table 2 summarises the details of the boreholes identified during the hydrocensus.

Table 2. Details of boreholes identified during hydrocensus

BH nr.	Coordinates (WGS84)	Owner/Contact details	Static water level (#mbgl)	Estimated Yield (liters/hour)	User application
MA-BH1	S 25.48220° E 28.02075°	Mabopane Cemetery 072 097 7174	7.00	1500	Domestic

#mbgl - meters below ground level

### 3.1.8 Magnetic and electromagnetic Traverses

One magnetic and electromagnetic traverse was performed with a total length of 300m. An anomaly was detected at 150m and a monitoring borehole was drilled at this location. Coordinates of the electromagnetic and magnetic traverses and position of drilling targets are presented in Table 3.

Table 3. Coordinates of the geophysical traverses and drilling targets

Traverse nr.	Start Coordinates (WGS84)	End Coordinates (WGS84)	Drilling Target (Borehole nr)
MA-T1	S 25.48107° E 28.02034°	S 25.47849° E 28.01958°	MA-BH2 (150m)

### 3.1.8.1 Ground Water Quality

The groundwater samples were submitted to an accredited laboratory (*Aquatico Scientific in Pretoria*) for a major cation/anion analysis, as well as selected trace metals.

Table 4. Chemical parameters compared to SANS 241-1:2011 (edition 1) drinking water standards

Sample Nr.	MABH1	MABH2					Standard Limits
Ca	24.00	55.30					~
Mg	2.29	10.50					~
Na	52.80	42.40					200
K	1.19	4.71					~
Mn	0	0					0.1
Fe	0	0					0.3
F	3.21	1.36					1.5
NO <sub>3</sub> -N	0.23	21.70					11
NH <sub>4</sub> -N	0.02	0.02					1.5
PO <sub>4</sub>	0.065	0.065					-
Cl	21.1	25.2					300
SO <sub>4</sub>	5.3	11.6					250
TDS	195	327					1200
T-Alk	138	130					~
pH	8.35	6.96					5.0 - 9.7
EC	33	53					170
Notes							
Yellow = Acceptable							
Exceeds standard limits							
0 = below detection limit of analytical technique							

EC measurements in mS/m, other parameters in mg/l

#### 3.1.8.1.1 Analysis of the water quality

Based on the results from the testing it can be concluded that the water quality in boreholes MA-BH1 exceeds the Standard Limits due to the elevated fluoride concentration. The water quality in borehole MA-BH2 exceeds the Standard Limits due to the elevated nitrate concentration, most probably originating from activities at the cemetery. Nitrate in the concentration present in MA-BH2 will result in methaemoglobinaemia also known as "Blue baby syndrome". This is the inability of red blood cells to carry oxygen in the blood stream. Furthermore, nitrate may react with secondary and tertiary amines and amides to form nitrosamines, which are known carcinogens.

A matter of concern is the high fluoride concentration in borehole MA-BH1. The borehole is an equipped production borehole and is used for domestic purposes by the staff of the cemetery as well as visitors to the site.

The health effects of fluoride in the concentration present in MA-BH1 may result in mottling of teeth and tooth damage may occur in long-term users.

### 3.1.9 AQUIFER CLASSIFICATION

According to the geohydrology study, it can be concluded that aquifer system in the study area can be classified as a "Sole Aquifer System". Groundwater is the sole water supply in the area. The aquifer is important for supplying baseflow to the Sand River.

#### 3.1.9.1 Aquifer Susceptibility

Aquifer susceptibility, a qualitative measure of the relative ease with which a groundwater body can be potentially contaminated by anthropogenic activities and which includes both aquifer vulnerability and the relative importance of the aquifer in terms of its classification, in terms of the above, is classified as low.

#### 3.1.9.2 Aquifer Protection Classification

The ratings for the Aquifer System Management Classification and Aquifer Aquifer Vulnerability Classification yield a Groundwater Quality Management Index of 12 for the study area, indicating that strictly non degradation protection may be required.

Due to the high GQM index calculated for this area, a strictly non-degradation level of protection is needed to adhere to DWS's water quality objectives. Reasonable and sound groundwater protection measures are recommended to ensure that no cumulative pollution affects the aquifer, even in the long term.

In terms of DWS's overarching water quality management objectives which is (1) protection of human health and (2) the protection of the environment, the significance of this aquifer classification is that if any potential risk exist, measures must be triggered to limit the risk to the environment, which in this case is the (1) protection of the Secondary Underlying Aquifer, (2) the Sand River which drains the subject area and (3) the number of external users of groundwater in the area.

### 3.1.10 Habitat units

Habitat units were initially delineated as part of the Ecology Study (Appendix G). The initial clusters were then subjectively grouped into broad units based on field observations and interpretation of available satellite imagery.

Three main habitat units were delineated. Habitat unit 1 consist of a mosaic between low open woodland and grassland savannah. Two sub-units are therefore indicated for habitat unit 1. Habitat units are indicated in **Figure 9** below.

### 3.1.10.1 Habitat unit 1 Broad-leaved woodland savannah

This habitat unit dominates the study area and consist of a mosaic of low, broad-leaved *Combretum* woodland and open savannah grassland, characteristic of Central Sandy Bushveld associated with shallow, rocky and / or gravelly soils. The open grassland areas are characterised by *Indigofera comosa*, *Xerophyta retinervis*, *Crabbea angustifolia*, *Diheteropogon amplexans*, *Bulbostylis burchelli*, *Heteropogon contortus* and *Dicoma anomala*. The wooded areas are characterised by *Gymnosporia polyacantha*, *Dombeya rotundifolia*, *Combretum zeyheri*, *Combretum apiculatum*, *Vitex zeyheri*, *Brachiaria nigropedata* and *Digitaria eriantha*. This unit also contains the less conspicuous *Gladiolus permeabilis* subsp. *edulis*.



Figure 5: Combretum woodland



Figure 6: Open savannah



Figure 7: Grassland savannah

Figure 8: Habitat units

### 3.1.10.2 Habitat unit 2 Thorny savannah

This habitat unit is characterised by a low, closed and characteristic shrubby thornveld. Typical species associated with this unit are *Dichrostachys cinerea* subsp. *africana*, *Acacia nilotica*, *Acacia tortillis*, *Peltophorum africanum*, *Euclea crispa*, *Schmidtia pappophoroides* and *Aristida congesta*.



Figure 9: Thornveld



Figure 10: Low shrubland



Figure 11: Closed veld

### 3.1.10.3 Habitat unit 3 Transformed

This habitat unit consist of areas that have been transformed by earthworks (borrow pits for sand) and illegal dumping. Weeds and alien floral species have invaded into these areas, but areas are mostly characterised by bare soils and limited ground cover. Conspicuous alien flora observed included *Zinnia peruviana*, *Ricinus communis*, *Datura* spp and *Solanum* spp.





Figure 12: Transformed area



Figure 13: Sand mining



Figure 14: Illegal dumping

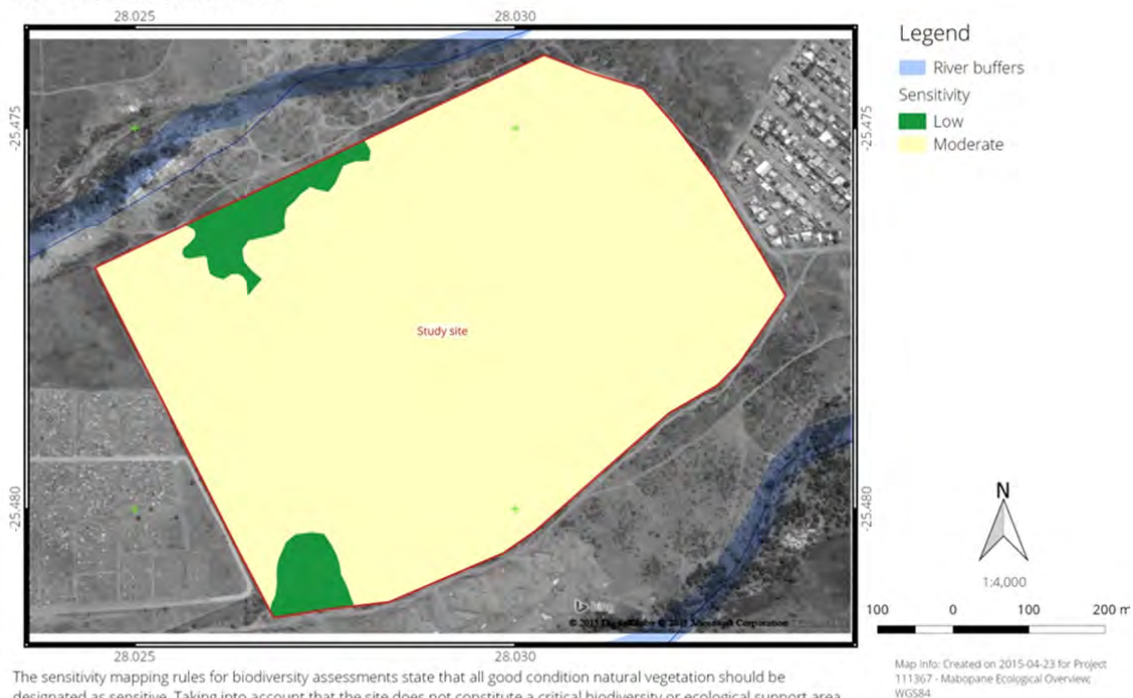
### 3.1.11 Ecosystem

Overall, the floral species composition is representative of the Central Sandy Bushveld vegetation type, specifically communities associated with shallow rocky or gravelly soils and shallow eutrophic sandy flats.

The ecosystem function is intact and provides habitat for generalist fauna and avi-fauna species and is relatively well connected to the remainder of the surrounding natural landscape. However, illegal dumping across the site and sand mining along the southern boundary and within the riparian zone results in the removal of natural vegetation and the introduction of alien invasive flora. Access to the site and the absence of control will only aggravate the situation in the future.

The sensitivity mapping rules for biodiversity assessments state that all good condition natural vegetation should be designated as sensitive. Taking into account that the site does not constitute a critical biodiversity or ecological support area, all natural vegetation areas were designated as being moderately sensitive (Figure 6)

#### BUFFERS AND SENSITIVITY



The sensitivity mapping rules for biodiversity assessments state that all good condition natural vegetation should be designated as sensitive. Taking into account that the site does not constitute a critical biodiversity or ecological support area, all natural vegetation areas were designated as being moderately sensitive. River buffers as determined by the Gauteng C-plan v3.3 are also indicated.

Sources: OGIS 2.8.1; SAGA GIS 2.1.4; BING Aerial Imagery

Figure 15: Sensitivity

aurecon

### 3.1.12 Fauna

As indicated in the specialist report (Appendix H), the Virtual Museum (VM) database cross referenced with data from the IUCN Red List of Threatened Species study revealed four species of conservation concern (SCC) that may potentially occur in this area. The species are discussed below:

#### 3.1.12.1 Giant Bullfrog *Pyxicephalus adspersus*

Suitable habitat for giant bullfrog is very limited within the study site. The giant bull frog is not regarded as listed near threatened species by several professionals. The likelihood of occurrence is therefore regarded as low to moderate.

#### 3.1.13 African White-tailed Rat *Mystromys albicaudatus*

This terrestrial rodent prefers black loam soil with a good vegetation cover within shrubland and grassland areas. No suitable habitat exist within the study area. The likelihood of occurrence is therefore regarded as low.

#### 3.1.14 Geoffroy's Horseshoe Bat *Rhinolophus clivosus*

Records of this bat species range from savannah woodland, shrubland (Mediterranean-type), dry savannah, open grasslands, semi-desert and more arid environments. It therefore has a wide distribution range. Roosting takes place across a wide range of structures including caves, rock crevices, disused mines and rural and urban buildings. It is listed globally as least concern on the IUCN Red List of Threatened Species in view of its wide distribution and recognized large population (Kock, Amr, Jacobs, Cotterill, Taylor, & Monadjem, 2008). However, in view of the local threats regarding this species, it is listed as near threatened according to the ADU. Although the species may forage within the study area, no suitable roosting sites exist. The likelihood of occurrence is therefore regarded as low.

#### 3.1.15 Schreibers's Long-fingered Bat *Miniopterus schreibersii*

This terrestrial migrating bat species forages across a variety of open to semi-open natural and artificial habitats, even suburban areas. Colonies roost mainly in caves and mines, but they have been found in man-made structures including tunnels, ruins and buildings. Roost sites are changed several times throughout the year and are probably linked to changes between seasonal climates. It is listed globally as near threatened on the IUCN Red List of Threatened Species in view of significant population declines across the northern parts (European countries) of its range (Hutson, Aulagnier, Benda, Karatas, Palmeirim, & Paunović, 2008). In addition, it is listed locally as near threatened according to the ADU. Although the species may forage within the study area, no suitable roosting sites exist. The likelihood of occurrence is therefore regarded as low.

#### 3.1.16 Rusty Pipistrelle *Pipistrellus rusticus*

Records of this terrestrial bat species indicate ranges throughout much of sub-Saharan Africa and specifically from savannah woodland, and both dry and moist savannah habitats. Roosting records indicate tree crevices, under bark and derelict buildings. It is listed globally as least concern on the IUCN Red List of Threatened Species in view of its wide distribution and recognized large population (Jacobs, Cotterill, Taylor, & Monadjem, 2008). However, in view of the local threats regarding this species, it is listed as near threatened according to the ADU. Suitable habitat and roosting sites exist within the study area. The likelihood of occurrence is therefore regarded as moderate.

### 3.1.16.1 Marsh Sylph *Metisella meninx*

The marsh sylph is found in wetland and marshy areas between the altitudes of 1400 and 1700 masl. throughout the Grassland biome. Suitable habitat sites are sometimes only colonised during suitable years from core populations. Thick stands of *Leersia hexandra* grass are required as the larval host plant. Although wetland habitats exist adjacent to the property area, the presence of *Leersia hexandra* grass needs to be present within the system in order for marsh sylphs to successfully breed. No wetland habitats occur on the site and *Leersia hexandra* was not recorded during this survey. The likelihood of occurrence is therefore regarded as moderate.

## 3.1.17 Flora

Aurecon ecology specialist initial study utilizing the National Herbarium Pretoria Computerised Information System (PRECIS) revealed nine species of conservation for the proposed area, which is discussed below. The initial results were cross referenced with data from the Red List of South African Plants to extract information on the ecology and threats pertaining to the recorded SCC.

### 3.1.17.1 IUCN listed floral species

#### 3.1.17.1.1 *Bushman Poison Bulb Boophane disticha*

This terrestrial bulbous amaryllid is mostly found scattered within dry grassland and rocky areas. It is threatened by overharvesting for the medicinal plant trade and therefore declining as a result. It is currently listed as declining according to the Red List of South African Plants (Williams, et al., 2008). This species was not located during the site visit, but suitable habitat does exist for this species within the study site. The likelihood of occurrence is therefore regarded as high.

#### 3.1.17.1.2 *Common Vlei Crinum Crinum macowanii*

This terrestrial bulbous amaryllid is mostly found scattered within mountain grassland and stony slopes with characteristic hard dry shale, gravely soil or sandy flats (Williams, et al., Crinum macowanii Baker, 2008). All Crinum spp. are threatened by overharvesting for the medicinal plant trade. No Crinum spp. was observed within the study area. However the likelihood of occurrence for *Crinum macowanii* within the study area is regarded as high due to the presence of suitable habitat within the study site.

#### 3.1.17.1.3 *Stenostelma umbelluliferum*

This terrestrial succulent from the dogbane family prefers deep black turf in open woodland specifically in the vicinity of drainage lines. The species has experienced significant declines as a result of habitat destruction associated with mining (specifically platinum and chrome) in the North West province and urban expansion in the northern boundary of Pretoria. In addition, due to the fertile nature of this species habitat, its habitat is highly sought after for cultivation. Recent field surveys have however located numerous large subpopulations that were previously overlooked. In addition, it appears that the species favours disturbance. It is currently listed as near threatened according to the Red List of South African Plants (Victor, Bester, & Pfab, Stenostelma umbelluliferum (Schltr.) S.P.Bester & Nicholas., 2007). No suitable habitat exists for this species. Likelihood of occurrence is therefore regarded as low.

#### 3.1.17.1.4 *Cape Holly Ilex mitis*

This terrestrial tree species from the holly family is found along rivers and streams in forests and thicket communities and occasionally in the open. This species has experienced significant declines due to bark-stripping for the medicinal plant trade. This practice is however largely limited to the Eastern Cape and is not severely impacted throughout the rest of its range (Williams, et al., 2008). Limited suitable habitat



exists for this species within the study area. Likelihood of occurrence is therefore regarded as low to moderate.

#### 3.1.17.1.5 *Trachyandra erythrorrhiza*

This perennial terrestrial herb prefers black turf marshes within the grassland biome. Recent intensive surveys around Gauteng have recorded numerous new sub-populations previously overlooked. Although the population trend for this species is still decreasing, in view of the recent discovery of sub-populations the current Red List status was changed from near threatened to least concern (Mills & Raimondo, 2013). This species was not observed within the study area. In addition no suitable habitat exists for this species within the site. Likelihood of occurrence is therefore regarded as low.

#### 3.1.17.1.6 *Argyrolobium campicola*

This terrestrial perennial herb is associated with Highveld grassland with a patchy distribution range from Pretoria to Dundee. There are currently nine known sub-populations and the population trend is decreasing due to habitat transformation and loss within its range. It is currently listed as near threatened according to the Red List of South African Plants (Edwards & Raimondo, 2006). This species was not observed during the field visit, but suitable habitat does exist within the area albeit limited. Likelihood of occurrence is therefore regarded as moderate.

#### 3.1.17.1.7 *Habenaria bicolor*

This slender terrestrial orchid is associated with well-drained grasslands restricted to Gauteng and Middelburg in Mpumalanga. It is considered rare and is continuously threatened by urban expansion. It is currently listed as near threatened according to the Red List of South African Plants (Vicor, 2009). This species was not observed during the field visit, but suitable habitat does exist within the area. Likelihood of occurrence is therefore regarded as moderate to high.

#### 3.1.17.1.8 *Habenaria kraenzliniana*

This slender terrestrial orchid is associated with stony grassy hillsides and is mainly located within the densely populated Gauteng province. It is considered rare and is continuously threatened by urban expansion. It is currently listed as near threatened according to the Red List of South African Plants (von Staden, Vicor, McMurtry, Grobler, & Burns, 2005). This species presence was confirmed during the site visit at one location, but suitable habitat exists across the site and more sub-populations are therefore likely. In addition, the Gauteng C-plan v3.3 the majority of the site consists of suitable habitat for this species.

#### 3.1.17.1.9 *Searsia gracillima* var. *gracillima*

This terrestrial shrub or small tree from the cashew or sumac family is currently known from seven to 10 locations restricted to a small area to the northeast of Pretoria. It is mainly associated with rocky quartzitic outcrops within bushveld and is potentially threatened by future development within its range. It is currently listed as near threatened according to the Red List of South African Plants (von Staden, 2008). This species was not observed during the field visit, but suitable habitat does exist within the area. Likelihood of occurrence is therefore regarded as moderate to high.

### 3.1.18 Protected Tree Species

A list of species was published under Government Notice (GN) 716 in Government Gazette (GG) 35648 of 7 September 2012. Under the published list the following species are relevant to this study based on their confirmed presence or previous records within the study area:

- *Sclerocarya birrea* subsp. *caffra* National Tree # 360
- *Combretum imberbe* Leadwood National Tree # 539

Under Section 15(1) of the National Forests Act 1998 (Act No 84 of 1998) the following restricted activities are applicable to protected trees

1. No person may -

- a) cut, disturb, damage or destroy any protected tree; or
- b) possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, or any forest product derived from a protected tree,

except –

- (i) under a licence granted by the Minister; or

in terms of an exemption from the provisions of this subsection published by the Minister in the Gazette on the advice of the Council.

# 4 WATER USE

This section provides a detailed description of the water use associated with the proposed Mabopane Cemetery in order for the DWS to make an informed decision regarding the issuing of the General Authorisation.

## 4.1 Summary of water uses

The water use that needs to be authorised is for the impact the cemetery will have on the groundwater resource/

Table 5: Summary of water uses for the Mabopane Cemetery expansion

WATER USE	Ref Points	WATER USE REFERENCE	COORDINATES							DESCRIPTION OF WATER USE	START DATE / END DATE
			Latitude				Longitude				
			Ref	°	'	"	°	'	"		
Section 21(g): Disposing of waste in a manner that may detrimentally affect a water resource;	Wm1-Wm5	WU1	Wm1	25	28	36.08	28	1	28.10	Cemetery that may have the potential of impacting on groundwater	
			Wm2	25	28	26.88	28	1	49.33		
			Wm3	25	28	37.90	28	1	0.50		
			Wm4	25	28	49.01	28	1	48.79		
			Wm5	25	28	53.16	28	1	35.66		



Figure 16: Water uses

## 4.2 Motivation for water uses

From the environmental point of view the proposed expansion of the cemetery is deemed necessary as the burial site has reached its full capacity. The proposed site of expansion measures approximately 31.8 hectares in extent. The expansion will extend approximately 13.3 hectares.

Apart from the potential groundwater contamination in a long run, there are no major detrimental impacts associated with the development anticipated in the near future. Most of the impacts will be felt during the construction phase, and with proper implementation of recommended mitigation measures the significance of the impacts will be reduced considerably. Therefore the EMP provided should be treated as a binding document during the construction and operation phase of the project. Refer to **Appendix C** Environmental Management Programme (EMPr), which indicates the steps CoTMM have taken to ensure that water resources will experience the minimum possible impact.

# 5 IMPACT ASSESSMENT

## 5.1 Impact assessment methodology

The impact assessment methodology used in this IWULA is based on the requirements of the DWS's 'Operational Guideline' (DWS, 2010). The impact assessment process requires that all the relevant data for the water uses and the impact of the water uses on the water resources be identified and used in the assessment. The impact assessment process includes the following data:

- Monitoring data;
- Published data; and
- Data available from the DWS or other stakeholders in the area.

The above-mentioned data was used for impact identification for the water uses on the water resource. The impact assessment was based on the following key elements:

### 5.1.1 Probability of occurrence:

This describes the likelihood of the impact actually occurring and is indicated as:

- Improbable, where the likelihood of the impact is very low;
- Probable, where there is a distinct possibility for the impact to occur;
- Highly probable, where it is very likely that the impact will occur; and
- Definite, where the impact will occur regardless of any management measure.

### 5.1.2 Consequence of occurrence:

In terms of:

- Nature of the impact (positive or negative);
- Probability of the impact occurring, being none, improbable, low probability, medium probability, high probability or definite;
- Extent of the impact, either local, regional, national or across international borders;
- Duration of the impact, either short term (0-5 years), medium term (6-15 years) or long term (the impact will cease after the operational life of the activity) or permanent, where mitigation measures by natural processes or human intervention will not occur; and
- Magnitude of the impact, either having a minor, low, moderate, high or very high effect on the natural, cultural and social functions and processes.

### 5.1.3 Significance level of the impact:

This is determined through a synthesis of the probability of occurrence and consequence of occurrence.

The impact rating is based on the assessment as described above and categorised into high, medium or low significance impacts. Management measures were then identified to mitigate, prevent and/ or reduce the impact. These measures primarily focus on the impacts identified as high in the ranking matrix, but will also include measures for impacts of medium and low significance.

In order to assess each of the factors for each impact, the ranking scales as contained in **Table 12** were used.

**Table 6: Ranking scales for assessing impact consequence**

<p><b>PROBABILITY = P</b></p> <p>5 – Definite / don't know</p> <p>4 – High probable</p> <p>3 – Medium probability</p> <p>2 – low probability</p> <p>1 – Improbable</p> <p>0 – None</p>	<p><b>DURATION = D</b></p> <p>5 – Permanent</p> <p>4 – Long-term (ceases after operational life)</p> <p>3 – Medium-term (5 – 15 years)</p> <p>2 – Short-term (0-5 years)</p> <p>1 - Immediate</p>
<p><b>EXTENT = E</b></p> <p>5 – International</p> <p>4 – National</p> <p>3 – Regional</p> <p>2 – Local</p> <p>1 – Site</p> <p>0 – None</p>	<p><b>MAGNITUDE = M*</b></p> <p>5 – Very high / Don't know</p> <p>4 – High</p> <p>3 – Moderate</p> <p>2 – Low</p> <p>1 – Minor</p>

*\*Note: the magnitude is rated from 1 to 5, twice. First for the environmental impact and then for the social impact, thereby having a total weight of 10 points.*

Once the factors had been assessed for each impact, the significance of each impact could be determined by applying the significance points (SP). The SP formula can be described as:

**SP = (magnitude (environmental + social) + duration + extent) x probability**

The maximum value of SP is 100. Environmental effects could therefore be rated as either high (H), moderate (M), or low (L) significance on the following basis:

- More than 60 points: **high** (H) significance;
- Between 30 – 60 points: **moderate** (M) significance; and
- Less than 30 points: **low** (L) significance.

Table 7: Impact assessment for the Section 21 water uses

IMPACT ASSESSMENT CRITERIA								
	Aspect	Impact	Mitigation	Impact rating prior to mitigation			Impact rating post mitigation	
<b>OPERATIONAL PHASE IMPACT ASSESSMENT</b>								
Ground Water	Impact on water quality	Deterioration in water quality as a result of dirty water entering the system. Dirty implying water containing contaminants from decaying human tissue and including bacteria, parasites and insects associated with decomposing human tissue. The impacts will be very low.	•	Extent	3	23	3	9
				Duration	3		3	
				Magnitude	1		1	
				Probability	1		0	





## 5.1.4 Mitigation measures

### 5.1.4.1 Mitigation measures during construction

In addition to the mitigation measures indicated in **Table 7** and in the EMP or EMPr (**refer to Appendix H**), the following mitigation measures will be implemented during construction:

- Where applicable, disturbed zones (i.e. for those areas that will not form part of the operational footprint but which were disturbed as part of the construction activities) should be rehabilitated and re-vegetated using site-appropriate indigenous vegetation and/or seed mixes;
- Alien vegetation should not be allowed to (re)colonize the disturbed wetland areas or any other areas outside wetlands;
- Rehabilitation of disturbed wetland habitat should commence during and immediately after construction has been completed;
- Construction should take place during the low flow months (winter) in order to minimise the risk to the hydrology of the system and to prevent excessive sediment and debris being washed into lower lying wetland areas;
- Chemical toilets must be provided for workers and these must be located outside the 30 m boundary of any wetlands;
- During the construction and operational phase, erosion and siltation measures should be implemented; and
- An Environmental Control Officer must be appointed to ensure compliance with the above requirements during the construction phase.

### 5.1.4.2 Mitigation measures during the operational phase

- Regular inspections will be undertaken of the watercourse crossings;
- Maintenance activities will be limited to the smallest possible area; and
- Maintenance vehicles will use existing authorised service roads(where possible).

## 6 MONITORING PROGRAMME

A groundwater monitoring network has been developed for the Mabopane Cemetery, incorporating the borehole identified during the hydrocensus and the newly drilled borehole (Table 8). It is important to note that a groundwater-monitoring network should be dynamic. This means that the network should be extended over time to accommodate the migration of contaminants through the aquifer as well as the expansion of infrastructure and/or addition of possible pollution sources.

Table 8. Monitoring boreholes to be included into the monitoring program

Borehole	Objective
MA-BH1	Downstream from the Cemetery. Impact Monitoring.
MA-BH2	Downstream from the Cemetery. Impact Monitoring.

Water samples must be taken from all the monitoring boreholes by using approved sampling techniques and adhering to recognised sampling procedures. Table 9 below presents the parameters and frequency that should form part of the groundwater monitoring program. The results should be recorded on a data base and reported annually to the Department of Water and Sanitation..

Table 9. Proposed monitoring requirements

Class	Parameter	Frequency	Motivation
Physical	Static groundwater levels	Monthly	Time dependant data is required to understand the groundwater flow dynamics of the site. An anomaly in static water levels caused by mounding below the drainage field may give early warning to spillages or leakages from lined/unlined facilities.
	Rainfall	Daily	Recharge to the saturated zone is an important parameter in assessing groundwater vulnerability. Time dependant data is required to understand the groundwater flow dynamics of the site.
	Groundwater abstraction rates (if present)	Monthly	Response of groundwater levels to abstraction rates could be useful to calculate aquifer storativity – important for groundwater management. Could also explain anomalous groundwater level measurements.
Chemical	Major chemical parameters: Ca, Mg, Na, K, NO <sub>3</sub> , NH <sub>4</sub> , SO <sub>4</sub> , Cl, Fe, P, F, Alkalinity, pH, EC, TDS, COD, TOC, BOD, TON.	Quarterly (Jan., Apr., Jul., Sept) May be reduced to bi-annual (April & Sept.) as more data becomes available)	Background information is crucial to assess impacts during operation and thereafter. Changes in chemical composition may indicate areas of groundwater contamination and be used as an early warning system to implement management/remedial actions. Legal requirement.
	Stable isotopes	As needed	The monitoring program should allow for research and refinement of the conceptual hydrogeological model. This may, from time to time, require special analyses such as stable isotopes.
Bacteriological	E. Coli, Total coliforms, Heterotrophic plate count	Quarterly (Jan., Apr., Jul., Sept)	Microbial presence may indicate areas of groundwater contamination and be used as an early warning system to implement management/remedial actions.



# 7 MOTIVATION FOR LICENCE APPLICATION

## 7.1 Motivation in terms of Section 27 of the NWA

### 7.1.1 Section 27(1) (a): Existing lawful water uses

Currently there are no existing water uses for the proposed project.

### 7.1.2 Section 27(1)(b): The need to redress the results of past racial and gender discrimination

In terms of historically disadvantaged South Africans (HDSA), CoTMM aims to achieve 50% participation in management. An Employment Equity is very important to o are black women. CoTMM aims to increase the employment opportunities for people with disabilities, as they are still underrepresented in the diverse workforce

Employment policies, practices and procedures relating to remuneration, training and development, etc. are continually being reviewed at divisional level to ensure the elimination of barriers to attracting and retaining candidates in management positions. There is an increased emphasis on mentoring, training and development in management to ensure their success. In-depth training in respect of the Employment Equity Act was given to the Employment Equity committee to ensure their understanding and appreciation of the purposes of the Act. Awareness in this regard is given to all employees in the annual refresher training sessions.

### 7.1.3 Section 27(1) (c): Efficient and beneficial use of water in the public interest

The purpose of designing the layout of the expansion of the Mabopane Cemetery lies outside of a surface watercourse will be beneficial use for the public (downstream water users) as the quality of the water will be minimally affected.

### 7.1.4 Section 27(1) (d): The socio economic impact

The project will support the National Development Plan for 2030 by contributing in the following ways:

- The project will create jobs and employment opportunities during the construction phase, in line with Government's growth strategy; and
- The project will contribute to the country's Gross Domestic Product (GDP) during the operational phase as it will increase the value of coal exports.



**7.1.5 27(1) (e): Any catchment management strategy applicable to the relevant water resource**

The catchment management strategy for Crocodile West and Marico WMA has not been developed. However, a number of studies and planning initiatives have been undertaken by the DWS for this area.

**7.1.6 Section 27(1) (f): The likely effect of the water use to be authorised on the water resource and on the water users**

The impacts during the construction and operational phases are expected to be of low significance as the site has been previously effected by activities within the port. CoTMM has identified the most appropriate location for the proposed storage areas, which have no direct impact on surface water courses. Technically, Transnet have considered proper management of storm water to prevent any dirty water discharge from entering watercourses without it being treated first. There is a likely effect that this application will be authorised as COTMM have considered all options to prevent, mitigate and reduce significant negative impacts on watercourses and downstream water users.

**7.1.7 Section 27(1) (g): The class and the resource quality objectives of the water uses**

There is currently no Resource Water Quality Objective (RWQO) for the Crocodile West and Marico WMA, but these are currently in development by the DWS.

**7.1.8 Section 27(1) (h): Investments already made and to be made by the water user in respect of the water use in question**

The amount of money investment in not known.

**7.1.9 Section 27(1)(i): The strategic importance of the water use that has been authorised**

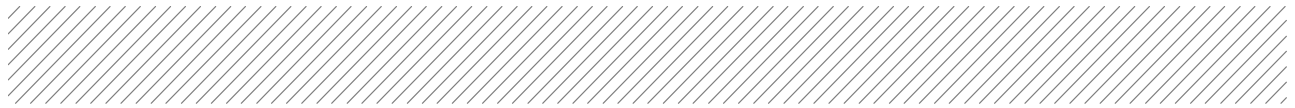
The strategic importance of the water use is to assist in meeting the strategic goal to increase cargo throughputs for new entry coal exporters.

**7.1.10 Section 27(1)(j): The quality of water in the water resource which may be required for the Reserve and for meeting international obligations**

The Reserve Determination for this water use is still in progress at the time of writing. The proposed Mabopane Cemetery expansion is expected to have a very low impact on the quality of the water resource during the construction and operational phases.

**7.1.11 Section 27(1)(k): The probable duration for any undertaking that a water use has been authorised**

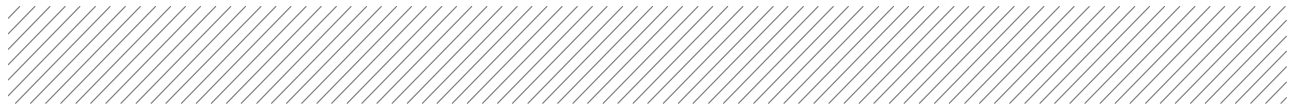
This is a project with a lifespan of is a more than 100 years..



## 7.2 Information submitted in support of the licence application

The following documents are submitted in support of the application for a water use licence:

- Environmental Authorisation and BAR (**Appendix A**);
- Water use maps (**Appendix B**);
- Design drawings by Aurecon (**Appendix C**);
- Completed application forms (**Appendix D**);
- Title deeds (**Appendix E**);
- Proof of payment of application fee (**Appendix F**);
- Surface Water Quality (Error! Reference source not found.);
- Relevant specialist reports (**Appendix G**);
- Environmental Management Plan (**Appendix G**); and
- Record of Public Participation (**Appendix H**).



# 8 AUTHORITY AND PUBLIC CONSULTATION

## 8.1 Consultation with Department of Water and Sanitation

A summary of the consultation undertaken with the DWS with regard to the IWULA for the proposed Mabopane Cemetery is provided in Table 10. Copies of the minutes of meetings and e-mail correspondence are attached in **Appendix H**.

Table 10: Summary of interaction with Department of Water and Sanitation

DATE	METHOD OF COMMUNICATION	DISCUSSION POINTS	ATTENDEES / RECIPIENTS
		•	

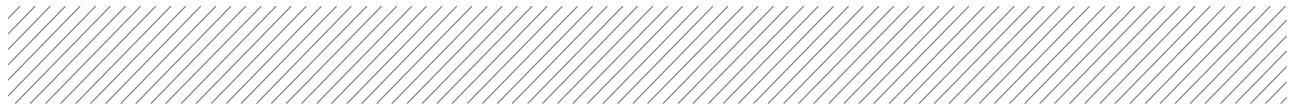
## 8.2 Public participation process

The public participation process involved the following (copies of relevant documents are included in **Appendix H**):

- Newspaper advertisements were placed in the following newspapers in both English and Zulu :

## 8.3 Comments/issues received

No comments were received from the public with regards to the IWULA but individuals did register as interested and affected parties (Refer to Appendix I).



## 9 CONCLUSIONS AND RECOMMENDATIONS

The proposed Cemetery and relevant infrastructure will not be constructed within any streams and rivers. CoTMM has taken into account the preservation of natural resources such as water and has planned for minimal impact on watercourses and other water resources. According to the relevant specialist findings, the current site has been considerably modified by the industrial activities within the site and surrounding the area. Impact on the environment is of low significance and with the appropriate mitigation measures and management strategies being implemented, it can be further reduced.

Once the licence is approved, it will be regularly reviewed and audited by independent environmental auditors (contracted by CoTMM) as part of the EMP for the Mabopane Cemetery. Based on the findings of these audits, corrective action will be taken, where necessary.

## 10 REFERENCES

Department of Environmental Affairs. 2014. National Guideline for the Discharge of Effluent from Land-based Sources into the Coastal Environment. Pretoria, South Africa. RP101/2014.

Department of Water Affairs and Forestry. 2012. South African Water Quality Guidelines for Coastal Marine Waters. Volume 2: Guidelines for Recreational Use. Pretoria, South Africa.

Department of Water Affairs and Forestry. 2010. Operational Guideline: Integrated Water and Waste Management Plan for the preparation of the Water Quality Management Technical Document to support the Application for Licences for Mining and Industries in Terms of the Requirements of the National Water Act, 1998 (Act 36 of 1998). Department of Water and Sanitation, Pretoria.

Department of Water Affairs and Forestry. 2004. Operational policy for the disposal of land-derived water containing waste to the marine environment of South Africa: Guidance on Implementation. Water Quality Management Series, Sub-Series No. MS 13.3. Edition 1. Pretoria.

Department of Water Affairs and Forestry. 2006. Best Practice Guideline G1 Storm Water Management. Directorate: Resource Protection and Waste, DWAF, Pretoria.

Department of Water Affairs and Forestry. 1999. Resource Directed Measures for Protection of Water Resources, Version 1 [Appendix W3].

Department of Water Affairs and Forestry. 1995. South African Water Quality Guidelines for Coastal Marine Waters. Volume 1: Natural Environment. Pretoria.

Department of Water and Sanitation. 2014. Resource Quality Services water quality data exploration tool. Online: <http://www.dwaf.gov.za/iwqs/wms/data/000key.asp>

Kleynhans C.J. 1999. A procedure for the determination of the ecological reserve for the purposes of the national water balance model for South African River. Institute of Water Quality Studies, Department of Water and Sanitation & Forestry, Pretoria.

Kleynhans C.J., Thirion C. and Moolman J. 2005. A Level 1 Ecoregion Classification System for South Africa, Lesotho and Swaziland. Report No. N/0000/00/REQ0104. Resource Quality Services, Department of Water and Sanitation and Forestry, Pretoria

Kotze, D.C., Marneweck, G.C., Batchelor, A.L., Lindley, D.S. & Collins, N.B. 2005. WET-Eco Services – A technique for rapidly assessing ecosystem services

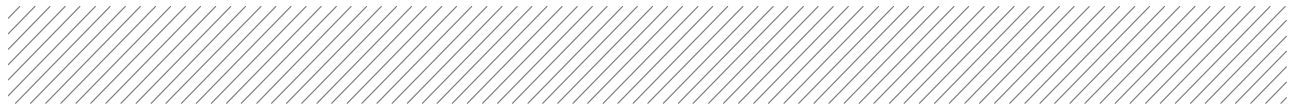
Meyer, R. & Godfrey, L. 1995. Characterization and Mapping of the Groundwater Resources, Kwazulu-Natal Province. Mapping Unit 7.

Parsons, R. 1993. A South African aquifer system management classification (Report No. KV 77/95). South African Water Research Commission, Pretoria.

Teurlings, P. & Pullen, B. 2007. Final Environmental Impact Assessment Report for the proposed Umfolozi to Empangeni 765kV Transmission Power Line and new substation. BKS (Pty) Ltd, Pretoria.

Van Riet W, Claasen P, Van Rensburg J, Van Viegen T, and Du Plessis L. 1997. Resource Directed Measures for the protection of Water Resources: River Ecosystems





Zululand District Municipality, South Africa Water Service Development Plan, 2009

Rossouw, W. & Walker, W. 2014. Surface Water Assessment Richards Bay Short Term Coal Terminal Phase 2: Integrated Water Use Licence Application (IWULA). Aurecon, Pretoria.

WR90, (1990). Surface Water Resources of South Africa, 1990, Volume 1. Report No 298/1.1/94 to the Water Research Commission, Pretoria, South Africa.

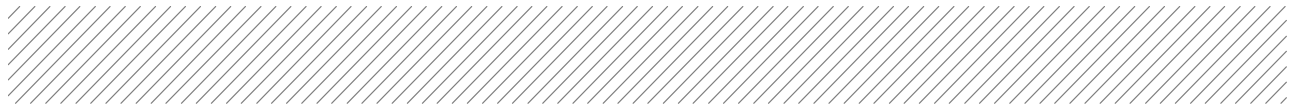
Water Research Commission. 2005.. Water Resources of South Africa, 2005, Version 2. Report No TT 380/08 to the Water Research Commission, Pretoria, South Africa.

# Appendices



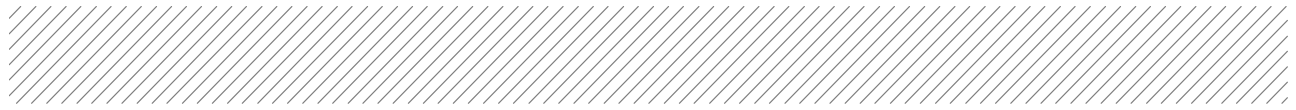
**Appendix A**  
**Environmental Authorisation  
and BAR**





# Appendix A.1

## Environmental Authorisation and Acknowledgement



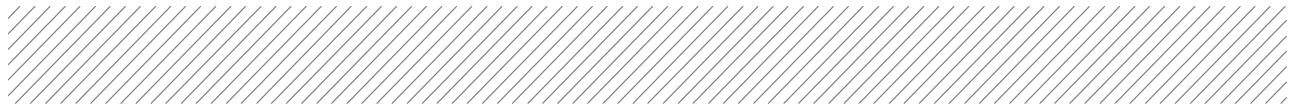
## Appendix A.2

# Draft Basic Assessment Report

# Appendix B

## Water Uses Maps

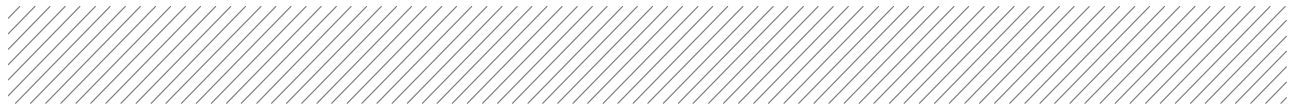




# Appendix B.1

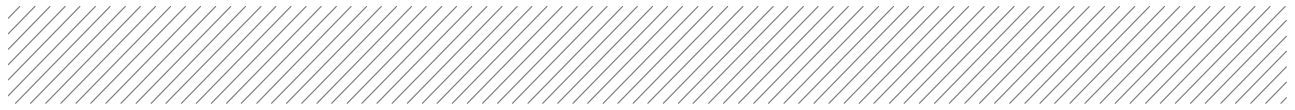
## Locality Map





# Appendix B.2

## Water Uses Map

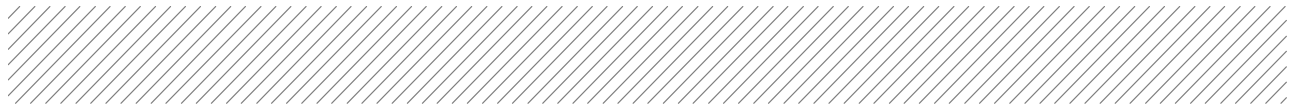




# Appendix C

## Technical Design





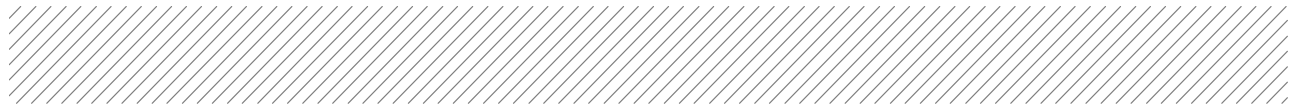
# Appendix C.1

## Technical Designs Drawings



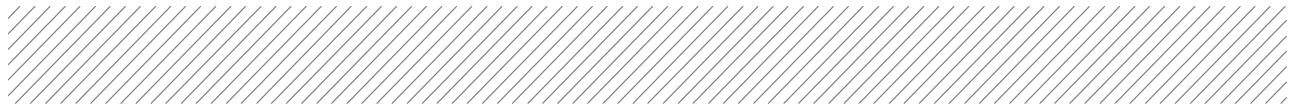
# Appendix C.2

## Construction Methodology



# Appendix C.3

## Construction EMP



# Appendix D

## Application forms







# Appendix D.1

## DW758

D.1.1 DW758 Application Form

D1.2 Identity Document



**water & sanitation**

Department:  
Water and Sanitation  
REPUBLIC OF SOUTH AFRICA

## REGISTRATION/LICENSING PART 1

## COMPANY, BUSINESS, PARTNERSHIP OR COMMUNITY, NATIONAL OR PROVINCIAL GOVERNMENT

### 1. GENERAL INFORMATION

Mark the applicable option(s) with an *X* and/or complete details where applicable/available.

**Indicate the nature of this application:**

New registration

Minor change

Formal amendment

Registration Number

--	--	--	--	--	--	--	--	--	--

### 2. PARTICULARS OF THE APPLICANT

**Application for:**  
(Mark one block with an X)

Company, business, partnership or community *(complete part 3,5,6,7 and 8)*

National or provincial government *(complete part 4,5,6,7 and 8 excl. 8.1.2)*

### 3. PARTICULARS OF THE COMPANY, BUSINESS, PARTNERSHIP OR COMMUNITY

**3.1 Name of company, business, partnership or community:**

CITY OF TSHWANE

**3.2 Trading name if different from name of company, business, partnership or community:**

SAME

**3.3 Type of enterprise:**  
(Mark one block with an X)

06 Public Company (Ltd)

07 Private Company (Pty) Ltd

08 Article 21 (Association Inc. under Article 21 of the Company Act No. 61 of 1973)

09 Limited By Guarantee

10 External Company

11 External Company under article 21 of the Company Act No. 61 of 1973

20 Transvaal Ordinance

21 Incorporated (Inc)

22 Unlimited

23 Close Corporation (CC)

24 Co-operative (CR)

Trust

Parastatal

Other [i.e. non-CIPRO Company types (e.g. Churches, Schools, Community Groups, etc.) excluding Trust and Parastatal]

**3.4 Business enterprise registration number:**

--

**3.5 Date established:**  
(ccyy/mm/dd)

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**3.6 Country where established:**

**3.7 VAT registration number:**

**4. PARTICULARS OF NATIONAL OR PROVINCIAL GOVERNMENT****4.1 National Department:****4.2 a) Provincial Department:****b) Province:****5. APPLICANT CONTACT DETAILS****5.1 Postal Address:**

Postal Code

**5.2 Street Address** (only if different from postal address):

Postal Code

**5.3 Contact telephone number during office hours**

Area/cell code

Number

Ext

**Alternative contact number**

Area/cell code

Number

Ext

**5.4 E-mail****6. CONTACT PERSON DETAILS****6.1 Title** MS**6.2 Name** RUDZANI**6.3 Surname** MUKHELI**6.4 Telephone**

Area/cell code

Number

Ext

**6.5 Cell Phone Number**

Area/cell code

Number

**6.6 Fax**

Area/cell code

Number

Ext

**6.7 E-mail**

**6.8 Preferred Form Of  
Communication**

EMAIL

---



## 7. LIST OF PART 2 DOCUMENTS (WATER USE RELATED FORMS)

Mark with an X which of the following documents have been submitted with this application

- |                                     |                         |                                     |   |
|-------------------------------------|-------------------------|-------------------------------------|---|
| <input type="checkbox"/>            | DW760 NWA-Section 21(a) | <input type="checkbox"/>            | DW768 NWA-Section 21(i)   |
| <input type="checkbox"/>            | DW761 NWA-Section 21(b) | <input type="checkbox"/>            | DW780 NWA-Section 21(h)   |
| <input type="checkbox"/>            | DW762 NWA-Section 21(b) | <input type="checkbox"/>            | DW805 NWA-Section 21(j)   |
| <input type="checkbox"/>            | DW763 NWA-Section 21(c) | <input type="checkbox"/>            | DW806 NWA-Section 21(k)   |
| <input type="checkbox"/>            | DW764 NWA-Section 21(d) | <input checked="" type="checkbox"/> | DW901 Property or properties where water use occurs                 |
| <input type="checkbox"/>            | DW765 NWA-Section 21(e) | <input checked="" type="checkbox"/> | DW902 Details of property owner                                     |
| <input type="checkbox"/>            | DW766 NWA-Section 21(f) | <input type="checkbox"/>            | DW903 Actual/Monitored waste discharge details NWA-Section 21 (f/h) |
| <input checked="" type="checkbox"/> | DW767 NWA-Section 21(g) | <input type="checkbox"/>            | DW904 Actual/Monitored waste discharge details NWA-Section 21 (e/g) |

## 8. THIS SECTION IS RESERVED FOR OFFICE USE ONLY

<b>8.1</b>	<b>Billing information</b>		
<b>8.1.1</b>	<input type="text"/>	<input type="text"/>	WMA for billing*
	* Water Management Area Codes		
	01 Limpopo	05 Vaal	09 Berg-Olifants
	02 Olifants	06 Orange	
	03 Inkomati-Usuthu	07 Mzimvubu-Tsitsikamma	
	04 Pongola-Umzimkulu	08 Breede-Gouritz	
<b>8.1.2</b>	District Municipal Establishment Levy Payable	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<b>8.2</b>	<b>Mark with an X which of the following documents have been submitted with this application</b>		
	<input type="checkbox"/> Certified copy of South African identity document		
	<input type="checkbox"/> Certified copy of passport		



File number (i.e. Office Hardcopy Register File No)

Water Use Register Number

Received by:

Surname

Initials

Position / Rank

Signature

Date (ccyymmdd)

Captured on NRWU database

Captured by:

Surname

Initials

Signature

Date stamp of receiving office

Quality Assurance Executed by:

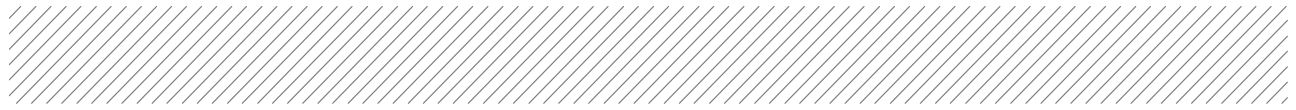
Surname

Initials

Position / Rank

Signature

Date (ccyymmdd)



# Appendix D.4

## DW767



RLA Business Unit

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

(NRWU = National Register of Water Use; RLA = Responsible Licensing Authority; WU = Water Use)

OR

Permit number:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

OR

Exemption reference number

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**1.5 Applicant Type** (mark only one block with X)

- |   |  |
|---|--|
| <input type="checkbox"/> Individual (complete 1.6)                                  | <input checked="" type="checkbox"/> Provincial Department (complete 1.9) |
| <input type="checkbox"/> Company, business, partnership or community (complete 1.7) | <input type="checkbox"/> Water Services Provider (complete 1.10)         |
| <input type="checkbox"/> National Department (complete 1.8)                         | <input type="checkbox"/> Water User Association (complete 1.11)          |

**1.6 If the applicant is an individual**

**1.6.1** Title  Surname  Initials

**1.6.2 South African ID (if holder of South African Id) alternatively Passport Number:**

ID Number or Passport Number

Passport Expiry Date (ccyymmdd)

Passport Country Of Issue

**1.7 If the applicant is a company, business, partnership or community:**

**1.7.1** Name of company, business, partnership or community:

**1.7.2** Business Enterprise Registration Number

**1.7.3** Date Established (ccyymmdd)

Country Where Established

**1.8 If the applicant is a National Department:**

**1.8.1** National Department Name:

**1.9 If the property owner is a Provincial Department:**

**1.9.1** Province:

**1.9.2** Provincial Department Name:

**1.10** If the property owner is a Water Services Provider:

**1.10.1**

Name of WSP:

**1.11** If the property owner is a Water User Association:

**1.11.1**

Name of WUA:

**1.12** **BBBEE Status**

Mark the applicable option(s) with an X)

- Historically Disadvantaged Individual
- Historically Advantaged Individual
- Black Economic Empowerment(BEE) Compliant

## Declaration by applicant or waste discharger

Delete the words that are not applicable I/we Mr Livhuwani Siphuma (FULL NAME(S)) hereby declare that the information provided by me/us in this application form is, to the best of my/our knowledge, true and correct.



\_\_\_\_\_  
Signature

\_\_\_\_\_  
Thumb print

\_\_\_\_\_  
Contact number during office hours

\_\_\_\_\_  
Designation of signatory

\_\_\_\_\_  
Date (ccyy/mm/dd):

**It is a criminal offence to provide information that is false or misleading.**

**2. DESCRIPTION OF THE WASTE GENERATED**

**2.1 Select the sector that generates the wastewater or waste which this application refers to**

(Mark only one box with an X)

(Note, if more than one option is applicable, you must fill in a separate application form per sub-sector)

- Agriculture**
  - Aquaculture
  - Irrigation
  - Intensive Animal Husbandry
  - Other (please specify below)

---

- Urban / Domestic**
  - Sewage Treatment Works
  - Waste Disposal
  - Water Treatment Works

---

- Industry**
  - Agroprocessing
  - Fertilisers
  - Metal Processing And Finishing
  - Textile
  - Power Generation
  - Meat Processing
  - Manufacturing
  - Paper And Pulp
  - Winery
  - Other (please specify below)

---

- Mining**
  - Coal
  - Gold
  - Platinum
  - Copper
  - Chromium
  - Iron
  - Diamond
  - Sand-winning
  - Quarrying
  - Peat Mining
  - Uranium
  - Other (please specify below)

**2.2 Which of the following describes the nature of the wastewater?**

(Mark the applicable option(s) with an X)

- 2.2.1 Wastewater containing <70% water by mass (i.e. sludge)
- 2.2.2 Wastewater containing >70% water by mass
- 2.2.3 Wastewater with high acidity (i.e. pH <5) or alkalinity (i.e. pH >10)
- 2.2.4 Wastewater with temperature of >50°C
- 2.2.5 Wastewater with an oxygen content of <5 mg/l
- 2.2.6 Wastewater with an EC (Electrical Conductivity) of >500mS/m
- 2.2.7 Wastewater with an EC of <500mS/m
- 2.2.8 Other, provide description

**2.3 Which of the following describes the composition of the wastewater?**

(Mark the applicable option(s) with an X)

- 2.3.1 Wastewater consisting of > 90% organic content by mass (i.e. load)
- 2.3.2 Wastewater consisting of 50 – 90% organic content and 10 – 50% metals or salts by mass (i.e. load)
- 2.3.3 Wastewater consisting of 10 – 50% organic content and 50 – 90% metals or salts by mass (i.e. load)
- 2.3.4 Wastewater consisting of >90% metals or salts by mass (i.e. load)
- 2.3.5 Other, provide description

**2.4 Describe the activity that generates the waste**

Cemetry expansion that has the potential to detrimenally imapct the ground water .

---



---



---



---



**2.5 Discharge to a land based facility**

**2.5.1 Water use start & end date**

When did/will this water use start? (ccyymmdd)

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

When did/will this water use end? (If applicable)  
(ccyymmdd)

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**2.5.2 The total volume of waste / waste water discharged per year:**

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Cubic meters

**2.5.3 The maximum volume of waste / waste water discharged on any given day:**

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Cubic meters

**2.5.4 The maximum Capacity of Storage**

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Cubic meters

**2.5.5 Monthly discharge pattern expressed in:**

Cubic meters

OR

Percentage (%) of total

OR

Another unit of measure

If "Another unit of measure" was selected, specify the "unit of measure" to be applied to the monthly discharge pattern details:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

	Minimum	Average	Maximum																																																															
January	<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																					
February	<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																					
March	<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																					
April	<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																					
May	<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																					
June	<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																					
July	<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																					
August	<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																					
September	<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																					
October	<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																					
November	<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																					
December	<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																						<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																					

### 2.5.5 Intake Water

National Water Act - Section 21(a/b/g/j) Water Use					
Section 21(?)	Registered*	Volume of water applicable to this waste discharge (m <sup>3</sup> )	If Registered*		
			Register Number	Water Use Number	Waste Management Facility Name
	<input type="checkbox"/> Yes <input type="checkbox"/> No				
	<input type="checkbox"/> Yes <input type="checkbox"/> No				
	<input type="checkbox"/> Yes <input type="checkbox"/> No				
	<input type="checkbox"/> Yes <input type="checkbox"/> No				

### 2.5.6 Average disposal volume / discharge volume onto the land / facility

Average disposal volume (cubic meters)	<input type="text"/>	Time Interval: <input type="checkbox"/> Per Month	<input type="checkbox"/> Per Annum
Maximum disposal volume anticipated (cubic meters)	<input type="text"/>	Time Interval: <input type="checkbox"/> Per Month	<input type="checkbox"/> Per Annum

Quality Variable And Unit Of Measurement	Concentration	For Office Use Only	
		Waste Load Onto Facility (kg)	NPS Load (kg)
Enteric pathogens e.g. E.coli (Colony Forming Units/ml)			
pH (pH units)			
Temperature (°C)			
Acidity (mg/l)			
Alkalinity (mg/l)			
Aluminium (mg/l)			
Ammonia (mg/l)			
Arsenic (mg/l)			
Barium (mg/l)			
Boron (mg/l)			
Bromide (mg/l)			
Cadmium (mg/l)			
Calcium (mg/l)			
Chemical oxygen demand (mg/l)			
Chloride (mg/l)			
Chromium (mg/l)			
Chromium(vi) (mg/l)			

*Continued on next page*

Quality Variable And Unit Of Measurement	Concentration	For Office Use Only	
		Waste Load Onto Facility (kg)	NPS Load (kg)
Cobalt (mg/l)			
Copper (mg/l)			
Cyanide (mg/l)			
Fluoride (mg/l)			
Iron (mg/l)			
Lead (mg/l)			
Lithium (mg/l)			
Magnesium (mg/l)			
Manganese (mg/l)			
Mercury (mg/l)			
Molybdenum (mg/l)			
Nickel (mg/l)			
Phenol (mg/l)			
Potassium (mg/l)			
Radionuclides (mg/l)			
Soap, oil or grease (mg/l)			
Sodium (mg/l)			
Sulphate (mg/l)			
Tin (mg/l)			
Total dissolved solids (mg/l)			
Total suspended solids (mg/l)			
Total nitrogen (mg/l)			
Total phosphorus (mg/l)			
Uranium (mg/l)			
Vanadium (mg/l)			
Zinc (mg/l)			

**3. RECEIVING ENVIRONMENT/RECEPTOR**

Serves to address the following: The resource that needs to be protected and related issues such as: how close to surface water, groundwater level, presence of boreholes, whether communities use boreholes or abstract from the surface water, etc.

**3.1 Description of nearby water resource(s)**

**3.1.1 Description of Surface Water Resources**

(Mark only applicable boxes with an X)

a) Type of surface water resources, nearest to location where discharge is taking place

- River / Stream
- Estuary
- Wetland
- Marine
- Dam
- Lake
- GWS Scheme
- Other (please specify below)

b) Names / descriptions of the nearest surface water resources:

Sand

c) Distance to the nearest water resource (meters)

5	0	0					
---	---	---	--	--	--	--	--

**3.1.2 Description of Groundwater Resources**

(Mark only one box with an X)

a) Type of groundwater resource, nearest to location where discharge is taking place

- Spring / Eye
  - Borehole
  - Other (please specify below)
  - GWS Scheme
  - Boreholes And Windmills On Government Land
  - Not Applicable
- Monitoring**

b) Name / description of the nearest surface water resource

c) Distance to the nearest groundwater resource (meters)

2	0	0					
---	---	---	--	--	--	--	--

**3.2 Drainage Region Details**

Quaternary Drainage Region

A	2	3	A
---	---	---	---

### 3.3 Property Relationship Details *(Complete supplementary forms DW901 & DW902)*

Property Name	Surveyed Property		Unsurveyed property		Property Relationship Date	
					From:	To:
Mabopane	Title Deed Number	T22316/2009	Surname of the Leader of Village, Community or Tribal Authority			
	Surveyor-General Cadastral Code		Initial of the Leader of Village, Community or Tribal Authority			
	Property Number	702 JR	Local Authority (if applicable)			
	Portion of property	33	Magisterial District (if applicable)			
			Tribal Authority/Council (if applicable)			
	Title Deed Number		Surname of the Leader of Village, Community or Tribal Authority			
	Surveyor-General Cadastral Code		Initial of the Leader of Village, Community or Tribal Authority			
	Property Number		Local Authority (if applicable)			
	Portion of property		Magisterial District (if applicable)			
			Tribal Authority/Council (if applicable)			
	Title Deed Number		Surname of the Leader of Village, Community or Tribal Authority			
	Surveyor-General Cadastral Code		Initial of the Leader of Village, Community or Tribal Authority			
	Property Number		Local Authority (if applicable)			
	Portion of property		Magisterial District (if applicable)			
			Tribal Authority/Council (if applicable)			
	Title Deed Number		Surname of the Leader of Village, Community or Tribal Authority			
	Surveyor-General Cadastral Code		Initial of the Leader of Village, Community or Tribal Authority			
	Property Number		Local Authority (if applicable)			
	Portion of property		Magisterial District (if applicable)			
			Tribal Authority/Council (if applicable)			

**4. DISPOSAL OF WASTE**

**4.1 Commonly used description of waste types to be disposed**

**4.1.1 Description of the types of waste to be disposed**

(Mark the applicable type option(s) with an X and/or complete details where applicable/available.)

- |  |   |
|--|---|
| <input type="checkbox"/> Sewage Sludge                   | <input type="checkbox"/> Household Refuse     |
| <input type="checkbox"/> Industrial Sludge               | <input type="checkbox"/> Farming Waste        |
| <input type="checkbox"/> Mining Waste                    | <input type="checkbox"/> Dry Industrial Waste |
| <input type="checkbox"/> Hazardous Waste                 | <input type="checkbox"/> Industrial Liquid    |
| <input type="checkbox"/> Industrial Ash (all industries) | <input checked="" type="checkbox"/> Other     |
| <input type="checkbox"/> Power Generation                | Specify Other: <u>Cemetry</u>                 |

**4.1.2 Approximate maximum volume/tonnage per site per day**

--	--	--	--	--	--	--	--	--	--

 tons

**4.1.3 Approximate total tonnage per site per annum**

--	--	--	--	--	--	--	--	--	--

 tons

**4.2 Type of waste management facility**

**4.2.1 Name of waste site or 'facility' (Refer *attached DW905 form*)**

**4.2.2 Select the type of waste disposal site** (Mark only one box with an X)

Waste Management Facility Type

	Select with X	Size (ha)	Estimated lifetime (y)	Disposal started on: (ccyymmdd)	Disposal ceased on: (if applicable) (ccyymmdd)																										
Artificial Wetlands	<input type="checkbox"/>	<table border="1"><tr><td> </td><td> </td><td> </td></tr></table>				<table border="1"><tr><td> </td><td> </td><td> </td></tr></table>				<table border="1"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										
Ash Dams / Dumps	<input type="checkbox"/>	<table border="1"><tr><td> </td><td> </td><td> </td></tr></table>				<table border="1"><tr><td> </td><td> </td><td> </td></tr></table>				<table border="1"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										
Coal Dams	<input type="checkbox"/>	<table border="1"><tr><td> </td><td> </td><td> </td></tr></table>				<table border="1"><tr><td> </td><td> </td><td> </td></tr></table>				<table border="1"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										
Composting	<input type="checkbox"/>	<table border="1"><tr><td> </td><td> </td><td> </td></tr></table>				<table border="1"><tr><td> </td><td> </td><td> </td></tr></table>				<table border="1"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										
Domestic Waste	<input type="checkbox"/>	<table border="1"><tr><td> </td><td> </td><td> </td></tr></table>				<table border="1"><tr><td> </td><td> </td><td> </td></tr></table>				<table border="1"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										
Effluent Dams	<input type="checkbox"/>	<table border="1"><tr><td> </td><td> </td><td> </td></tr></table>				<table border="1"><tr><td> </td><td> </td><td> </td></tr></table>				<table border="1"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										
Evaporation Dams/Ponds	<input type="checkbox"/>	<table border="1"><tr><td> </td><td> </td><td> </td></tr></table>				<table border="1"><tr><td> </td><td> </td><td> </td></tr></table>				<table border="1"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										
Forced Evaporation	<input type="checkbox"/>	<table border="1"><tr><td> </td><td> </td><td> </td></tr></table>				<table border="1"><tr><td> </td><td> </td><td> </td></tr></table>				<table border="1"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										

*Continued on next page*

Waste Management Facility Type	Select with X	Size (ha)	Estimated lifetime (y)	Disposal started on: (ccyymmdd)	Disposal ceased on: (if applicable) (ccyymmdd)
Other Waste Water Ponds: (Specify other)	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Open Cast Voids	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Oxidation Ponds	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Polluted Storm Water System	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Recycling	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Return Water Dams	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Silt Dams	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Slag Dumps	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Slimes/Tailings Dams	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Sludge Ponds/Lagoons	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Waste Rock Dump	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Waste Storage	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Waste Treatment Plant	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Other	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
If selected other describe	<hr/>				





**5. THIS SECTION IS RESERVED FOR OFFICE USE ONLY**

<b>6.1 Management Classification Details</b>						
Waste Generating Sector	Waste Disposal Site Type	Lining System	Constituent (Quality Variable)	Management Classification (Mark applicable option(s) with an X)		
				Best practice leading to zero impact	Standard/minimum requirements	Poor practice
Mining	Slimes/Tailings Dams		Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 0.75%	<input type="checkbox"/> 1.5%
	Evaporation Dams/Ponds		Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 0.75%	<input type="checkbox"/> 1.5%
	Effluent Dams		Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 0.75%	<input type="checkbox"/> 1.5%
	Return Water Dam		Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 0.75%	<input type="checkbox"/> 1.5%
	Forced Evaporation		Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 0.75%	<input type="checkbox"/> 1.5%
	Ash Dams/Dumps		Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 0.75%	<input type="checkbox"/> 1.5%
	Open Cast Voids		Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 0.75%	<input type="checkbox"/> 1.5%
	Waste Rock Dump		Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 0.75%	<input type="checkbox"/> 1.5%
	Polluted Storm Water System		Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 0.75%	<input type="checkbox"/> 1.5%

*Continued on next page*

Waste Generating Sector	Waste Disposal Site Type	Lining System	Constituent (Quality Variable)	Management Classification (Mark applicable option(s) with an X)		
				Best practice leading to zero impact	Standard/minimum requirements	Poor practice
Industry	Evaporation Dams/Ponds	Synthetic liner	Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 1%	<input type="checkbox"/> 10%
		Clay liner	Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 2.5%	<input type="checkbox"/> 10%
	Maturation Ponds		Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 10%	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> %
	Coal Dams	Clay liner and seepage drains	Salinity, pH, SO <sub>4</sub> , heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 1%	<input type="checkbox"/> 10%
	Polluted Storm Water System	Collection and containment facilities	Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 1%	<input type="checkbox"/> 100% (no system)
		System captures 1:100 year storm-event	Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 1%	60-80% (system overflows 1:2 to 1:5 years) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> %

*Continued on next page*

Waste Generating Sector	Waste Disposal Site Type	Lining System	Constituent (Quality Variable)	Management Classification (Mark applicable option(s) with an X)		
				Best practice leading to zero impact	Standard/minimum requirements	Poor practice
Domestic	Oxidation Ponds	Synthetic liner	Nutrients, COD, pathogens	<input type="checkbox"/> 0%	<input type="checkbox"/> 0.5%	<input type="checkbox"/> 7.5%
			Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 1%	<input type="checkbox"/> 10%
		Clay liner	Nutrients, COD, pathogens	<input type="checkbox"/> 0%	<input type="checkbox"/> 1%	<input type="checkbox"/> 7.5%
			Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 2.5%	<input type="checkbox"/> 10%
	Artificial Wetlands	Synthetic liner	Nutrients, COD, pathogens	<input type="checkbox"/> 0%	<input type="checkbox"/> 0.5%	<input type="checkbox"/> 7.5%
			Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 1%	<input type="checkbox"/> 10%
		Clay liner	Nutrients, COD, pathogens	<input type="checkbox"/> 0%	<input type="checkbox"/> 1%	<input type="checkbox"/> 7.5%
			Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 2.5%	<input type="checkbox"/> 10%
	Polluted Storm Water System	Collection and containment facilities, system captures 1:100 year storm event	Nutrients, COD, pathogens	<input type="checkbox"/> 0%	<input type="checkbox"/> 1%	<input type="checkbox"/> 100% (no system)
			Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 1%	60-80% (system overflows 1:2 to 1:5 years) <input type="text"/> <input type="text"/> <input type="text"/> %

*Continued on next page*

Waste Generating Sector	Waste Disposal Site Type	Lining System	Constituent (Quality Variable)	Management Classification (Mark applicable option(s) with an X)		
				Best practice leading to zero impact	Standard/minimum requirements	Poor practice
Agricultural	Oxidation Ponds	Synthetic liner	Nutrients, COD, pathogens	<input type="checkbox"/> 0%	<input type="checkbox"/> 0.5%	<input type="checkbox"/> 7.5%
			Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 1%	<input type="checkbox"/> 10%
		Clay liner	Nutrients, COD, pathogens	<input type="checkbox"/> 0%	<input type="checkbox"/> 1%	<input type="checkbox"/> 7.5%
			Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 2.5%	<input type="checkbox"/> 10%
	Artificial Wetlands	Synthetic liner	Nutrients, COD, pathogens	<input type="checkbox"/> 0%	<input type="checkbox"/> 0.5%	<input type="checkbox"/> 7.5%
			Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 1%	<input type="checkbox"/> 10%
		Clay liner	Nutrients, COD, pathogens	<input type="checkbox"/> 0%	<input type="checkbox"/> 1%	<input type="checkbox"/> 7.5%
			Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="checkbox"/> 2.5%	<input type="checkbox"/> 10%
	Polluted Storm Water System		Nutrients, COD, pathogens	<input type="checkbox"/> 0%	<input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/> %	<input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/> %
			Salinity, pH, SO <sub>4</sub> , Cl, Na, heavy metals	<input type="checkbox"/> 0%	<input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/> %	<input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/> %

**6.2 Waste Disposal Site Classification**

Mark the site classification with an X (only one option may be selected)

- GCB+                       GSB+                       GMB+                       GLB+  
 GCB-                       GSB-                       GMB-                       GLB-  
 H:H                           H:h

Legend			
B -	Water deficit climate resulting in only sporadic leachate generation	C	Communal Landfill
B +	Water surplus climate resulting in significant leachate generation	S	Small Landfill
G	General waste or landfill for general waste	M	Medium Landfill
H : H	Hazard waste landfill that can receive waste with a hazard rating of 1 and 2	L	Large Landfill
H : h	Hazard waste landfill that can receive waste with a hazard rating of 3 and 4		

Site classification Date (ccyymmdd)

**6.3 Authorisation / Regulation Details**

**6.3.1** Authorisation/Regulation Type (mark the applicable option with an X)

- Licence (*"Registration of a Waste Management Facility in terms of Section 21(g) of the National Water Act".*)  
 Permit (*"Registration of a Waste Management Facility in terms of Section 20(1) of the Environmental Conservation Act".*)  
 Direction (*"Registration of a Waste Management Facility in terms of Section 20(5) of the Environmental Conservation Act".*)  
 Exemption (*"Registration of a Waste Management Facility in terms of Section 20(1) of the Environmental Conservation Act".*)

**6.3.2** Applicable Authorisation / Regulation Reference Number \_\_\_\_\_

OR

Environment Conservation Act Permit Number \_\_\_\_\_

**6.3.3** The authorisation/regulation is valid from  Until   
(ccyymmdd) (ccyymmdd)

**6.4 Succession transfer and source part 2 details**

**6.4.1** Is this a 'succession in title' related water use transfer?  Yes  No

**6.4.2** If yes, complete the following details where applicable.

Source Register Number	WU Number	WU Status to be Allocated	WU Close Date (if applicable) (ccyymmdd)
<input type="text"/>	<input type="text"/>	_____	<input type="text"/>
<input type="text"/>	<input type="text"/>	_____	<input type="text"/>
<input type="text"/>	<input type="text"/>	_____	<input type="text"/>

**6.5 District Municipality**

District Municipality Name (if applicable)

---

**6.6 Billing information**

**6.6.1 Applicant to be billed as:**

Water User or  Via a WUA/WSP

Start Date (ccyymmdd)

--	--	--	--	--	--	--	--	--	--

End Date (ccyymmdd)

Water User

**6.6.2 Bill incentive charge:**

On actual load(s) or  Registered load(s)

Start Date (ccyymmdd)

--	--	--	--	--	--	--	--	--	--

End Date (ccyymmdd)

On actual load(s)

**6.6.3 Billing Frequency:**

Annually

Bi-annually

Monthly

**6.6.4 If to be billed via WUA/WSP:**

Name of WUA/WSP

---

Is WUA/WSP a Billing Agent?

Yes

No

Billing Agent's Register Number

--	--	--	--	--	--	--	--	--	--

**6.6.5 If this WU is to be billed via a Bulk Billing Party that is not a WSP/WUA, complete the following:**

Name of Customer

---

Bulk-Bill-to-Party Register Number

--	--	--	--	--	--	--	--	--	--

**6.7 Waste management scheme information**

**Waste scheme name** (if applicable)

- If the Waste Scheme is applicable, provide WSMP (Waste Scheme Management Parameter Name)

--

- Specify the date from which this WSMP is applicable to this water use (ccyymmdd)

--	--	--	--	--	--	--	--	--	--

**6.8 Late registration penalty**

Is this a late registration?

Yes

No

If yes, mark with an X, the applicable penalty to be levied

R300.00 OR

10% (ten percent) of the annual water use charge outstanding at the date of registration which ever is greater

Specify the penalty amount payable

---

Waive penalty

**6.9 Authorisation details**

**6.9.1 Water use takes/took place in terms of the General Authorisation:**  Yes  No

\*If yes complete the following details after confirmation with relevant DWAF/CMA officials:

<u>Date(s) from which applicable GA is/was applicable to this water use</u>			
South African Act:	[E.g. National Water Act (Act No. 36 of 1998)]	Applicable section of the act	[E.g. Section 21]
Date From (ccyymmdd)	<input style="width: 100%;" type="text"/>	Government Notice No.	<input style="width: 100%;" type="text"/>
Date To (ccyymmdd)	<input style="width: 100%;" type="text"/>	Government Notice Date (ccyymmdd)	<input style="width: 100%;" type="text"/>
Applicable Section Of The General Authorisation		<hr/>	
Date From (ccyymmdd)	<input style="width: 100%;" type="text"/>	Government Notice No.	<input style="width: 100%;" type="text"/>
Date To (ccyymmdd)	<input style="width: 100%;" type="text"/>	Government Notice Date (ccyymmdd)	<input style="width: 100%;" type="text"/>
Applicable Section Of The General Authorisation		<hr/>	
Date From (ccyymmdd)	<input style="width: 100%;" type="text"/>	Government Notice No.	<input style="width: 100%;" type="text"/>
Date To (ccyymmdd)	<input style="width: 100%;" type="text"/>	Government Notice Date (ccyymmdd)	<input style="width: 100%;" type="text"/>
Applicable Section Of The General Authorisation		<hr/>	

**6.9.2 If an authorisation has been issued under other legislation – provide the Law/Regulation details if known/available.**

**6.9.3 If this application represents a licence related water use (new licence application or previously submitted application) – complete following details if known/available.**

Responsible Licensing Authority Reference

Responsible Licensing Authority Business

Unit 

---

Water Quality Management Assessment:

Surname

Initials

Position / Rank

Signature

Date (ccyymmdd)

File number (i.e. Office Hardcopy Register File No)

Waste Management Facility Number

Water Use Register Number

Received by:

Surname

Initials

Position / Rank

Signature

Date (ccyymmdd)

Captured on NRWU database

Captured by:

Surname

Initials

Signature

Date stamp of receiving office

Quality Assurance Executed by:

Surname

Initials

Position / Rank

Signature

Date (ccyymmdd)





# Appendix D.4

## DW901



## water & sanitation

Department:  
Water and Sanitation  
REPUBLIC OF SOUTH AFRICA

### SUPPLEMENTARY WATER USE INFORMATION PROPERTY WHERE WATER USE OCCURS

*DW901 serves to address the following: The property (or properties) where water use(s) is to take place.*

*•Complete one DW901 form for each property impacted / applicable to a water use registration application.*

*•Should more than one property owner be applicable to a "property where water occurs" an additional DW902 must be completed for each additional property owner.*

#### 1. PROPERTY WHERE WATER USE(S) OCCURS

- 1.1 Property where water use takes place (farm, stand or community): description as per the Deeds Act if applicable, or name of agricultural holding, farm, township, town or city.

PORTION 3 OF THE FARM SJAMBOK ZIJN OUDE KRAAL 258 JR

Registration Date (ccyymmdd):

--	--	--	--	--	--	--	--	--	--

- 1.2 Property Type (mark only one with an X)

- |   |   |
|---|---|
| <input type="checkbox"/> Agricultural Holding             | <input type="checkbox"/> Erf                                |
| <input type="checkbox"/> Exclusive Use Areas (EUA)        | <input checked="" type="checkbox"/> Farm                    |
| <input type="checkbox"/> Sectional Scheme (To Obtain EUA) | <input type="checkbox"/> Sectional Scheme (to obtain units) |
| <input type="checkbox"/> Sectional Scheme Unit            | <input type="checkbox"/> Township                           |
| <input type="checkbox"/> Unspecified                      | <input type="checkbox"/> Unsurveyed                         |

- 1.3 If the property type is unsurveyed, complete the following:

- a) Surname and initials of leader of village, community or tribal authority

Initials

--	--	--	--	--	--

- b) Local Authority

**&/or**

- c) Magisterial District

**&/or**

- d) Tribal Authority/Council

- 1.4 If the property type is not equal to unsurveyed, complete the following:

- a) Deeds Office

- b) Registration Division

JR

- c) Property No (i.e. Farm No./Erf No./Holding Area No./Scheme No.)

258

- d) Portion of Property

3

- e) Title Deed Number

f) Surveyor-General Cadastral Code

1	-	2	-	3	-	4	-	5
□	-	□ □ □ □	-	□ □ □ □	-	□ □ □ □ □ □ □ □ □ □	-	□ □ □ □ □ □

1. Refers to the Surveyor's-General Office (T = Pretoria, F = Free State, C = Cape Town & N = Kwazulu-Natal)
2. Major Code (Registration Division)
3. Minor code
4. Property No (i.e. Farm No./Erf No./Holding Area No./Sheme No.)
5. Portion Number

*Note: All fields "left padded with 0"*

**1.5 Property Area Size**

□	□	1	1	.	8	3	1
---	---	---	---	---	---	---	---

Measure Unit:     Hectares     Square Meters     Acres

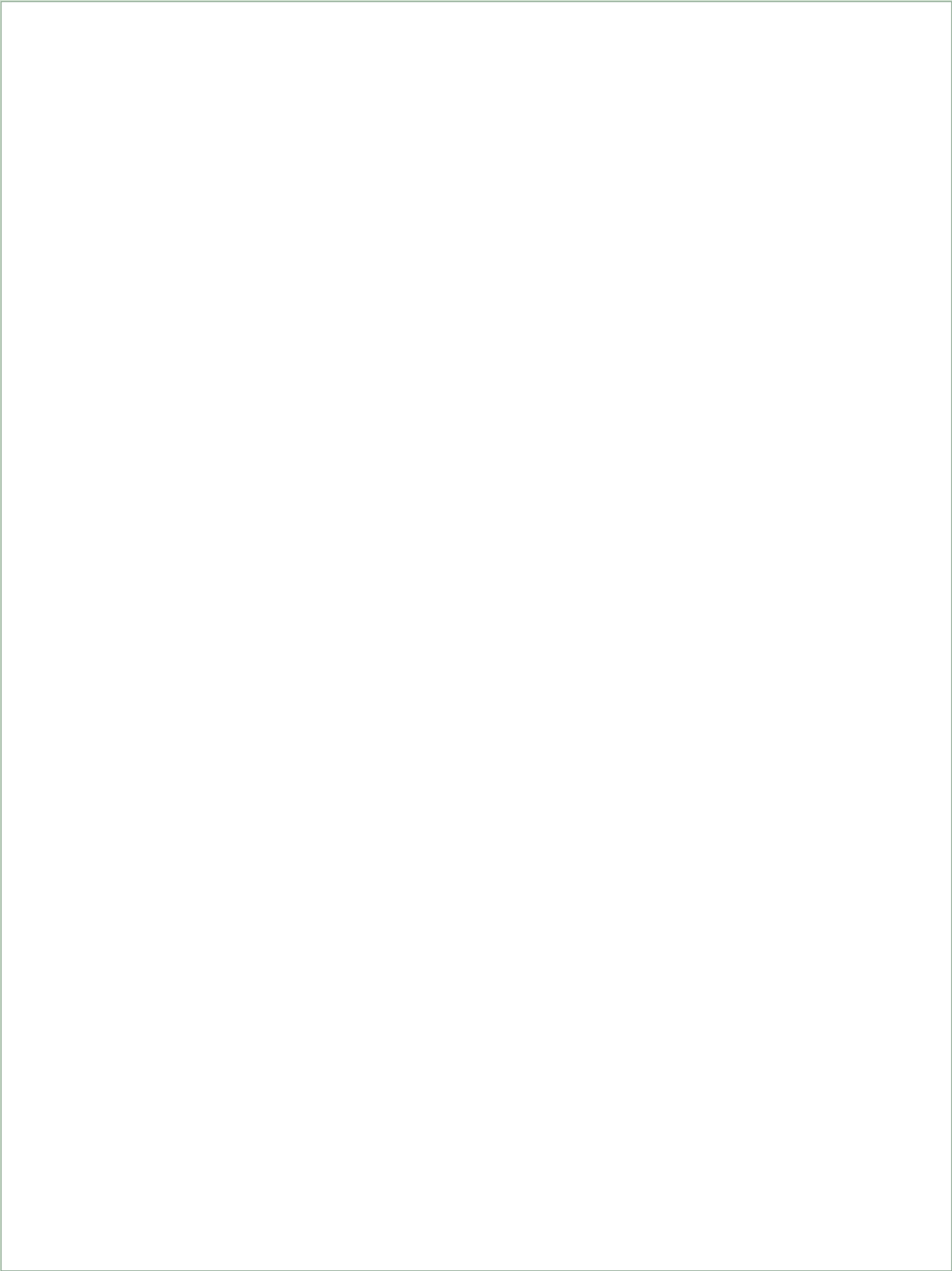
**1.6 Ownership of the property (mark only one with an X)**

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Property owned by applicant (100% Share value) | <input type="checkbox"/> Property leased by applicant  |
| <input type="checkbox"/> Property owned by applicant (Share value less than 100%)  | <input type="checkbox"/> The property is communal land |

**2. PROPERTY OWNER RELATIONSHIP**

Individual (Identity Number or Passport Number)	Company, Business, Partnership or Community (Business Enterprise Registration Number)	Property Owner Name	Property Owner Document Number <small>(Owner's Title Deed Reference Number)</small>	Property Owner and Property Relationship Date		Owner Share Value %
				From:	To:	
		CITY OF TSHWANE	100			

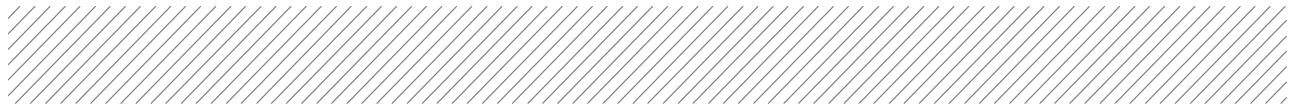




# Appendix E

## Title Deeds





# Appendix E.1

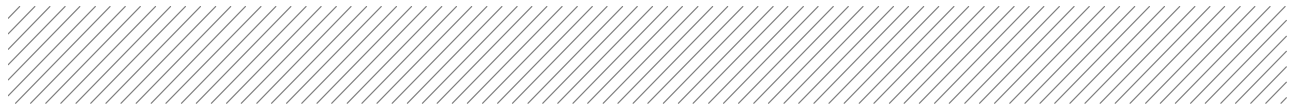
## Title Deed Summaries

# Appendix F

## Proof of Payment







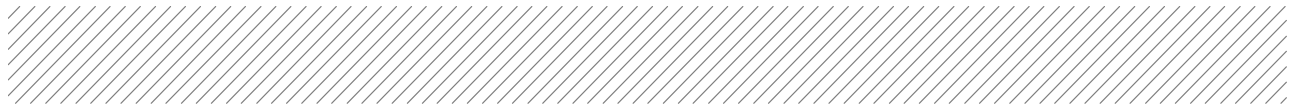
# Appendix F

## Proof of Payment

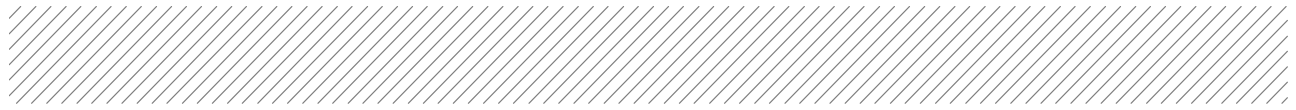
# Appendix F

## Relevant Specialist Studies



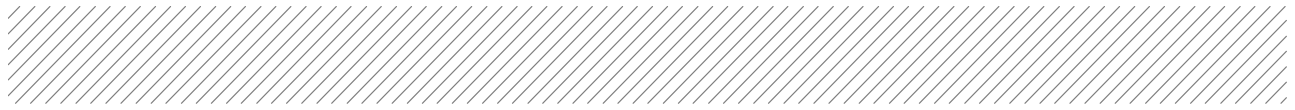


# Appendix F.1 Ecological Study



# Appendix F.2

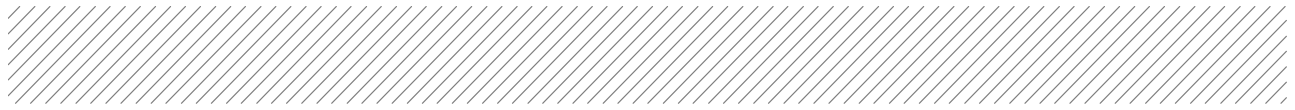
## Geoghydrological assessment



# Appendix G

## Environmental Management and Rehabilitation Plan





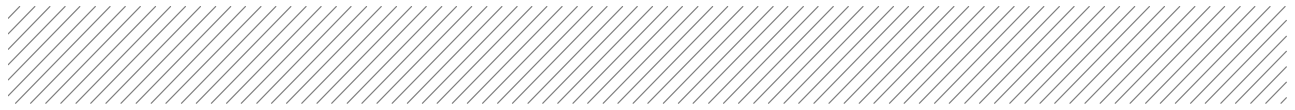
# Appendix H.1 Environmental Management Plan



# Appendix H

## Record of Public Participation

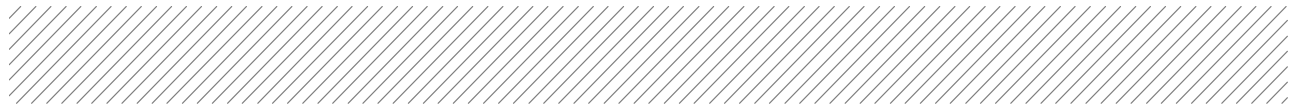




# Appendix H.1

## Correspondence with the DWS





# Appendix H.2

## Proof of Newspaper Advertisement