

HIGH CONFIDENCE GROUNDWATER RESERVE DETERMINATION STUDY IN THE BERG CATCHMENT

Background Information Document No.01

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water & sanitation

Department:
Water and Sanitation
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PURPOSE OF THIS DOCUMENT

The purpose of this Background Information Document (BID) is to inform stakeholders about the study, initiated by the Department of Water and Sanitation (DWS), to determine a High Confidence Groundwater Reserve in the Berg catchment. This study will determine groundwater Reserve requirements, in terms of quantity and quality, to satisfy the basic human needs and to protect aquatic ecosystems in priority water resources within the Berg catchment. Detailed determinations aim to produce high-confidence results, which are based on site-specific data collected by specialists, and are used for all compulsory licensing exercises, as well as for the individual licence applications that could have a large impact on any catchment, or a relatively small impact on ecologically important and sensitive catchments.

Stakeholders are invited to participate by commenting on information sent, attending meetings or workshops, or by corresponding with the stakeholder engagement office or the technical team at the addresses provided below.

CONTACTS

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BACKGROUND

The National Water Act (No. 36 of 1998) (NWA) provides a legal framework for the effective and sustainable management of all significant water resources in South Africa. Through the implementation of Resource Directed Measures (RDM) and its obligation to achieve a balance between the protection, use, conservation, management and control of water resources, the RDM includes the Classification, the Reserve, and Resource Quality Objectives (RQOs).

The Reserve (i.e. water “set aside” to provide for basic human needs and to sustain water ecosystems) is the only right to water in the NWA. It therefore has priority over all other water use and should be set as soon as the Class is determined for each water resource. This is to say that the amount of water required for the Reserve must be met before water resources can be allocated to other water users. The requirements of the Reserve and all other demands on the water resource are covered by the determination of RQOs of priority sites.

It is important to note that the NWA clearly includes groundwater in the definition of a water resource, but the overall characteristics of groundwater sometimes require a different management approach. Therefore, because of the contribution of groundwater to surface water flow, the volume of groundwater that could sustainably be abstracted without impacting the ability of the groundwater to maintain or contribute to surface water must be considered when determining the Reserve.

Due to the increasing number of water use licence applications (WULAs), the associated impacts that the proposed developments might have on the availability or quality of water, the conservation status of various resources, and the complexity of geological and hydrogeological characteristics within the Berg catchment make it increasingly impossible to assess WULAs using a low confidence desktop groundwater Reserve. The Chief Directorate: Water Ecosystems Management (CD: WEM) has therefore initiated a “High Confidence Groundwater Reserve Determination Study for the Berg Catchment” in support of the gazetted Water Resource Classes and RQOs for the Berg catchment (Gazette No.42451:121 of 10 May 2019; hereafter referred to as DWS, 2019: 121).

PROJECT WEBSITE LINKS

Resource Directed Measures

<http://www.dwa.gov.za/rdm/>

Status of Reserve Determinations

<https://www.dws.gov.za/RDM/Status.aspx>

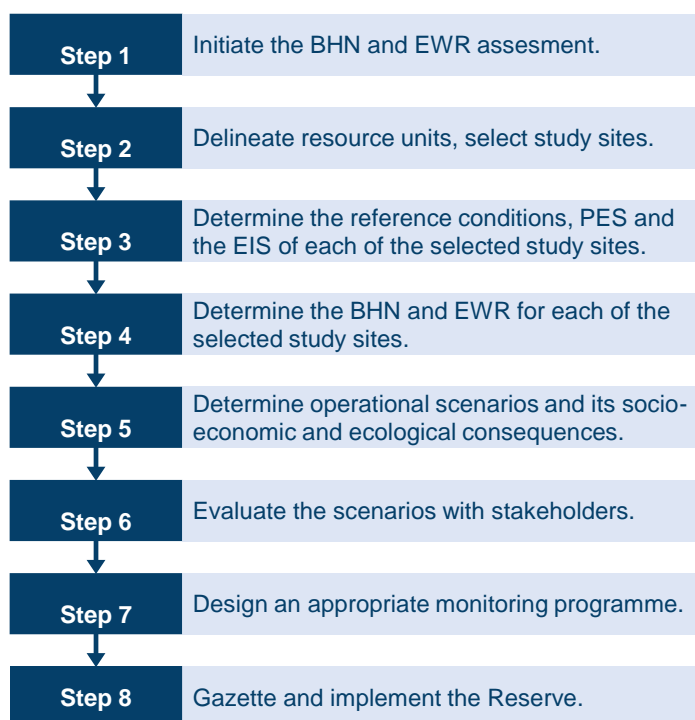
STUDY OBJECTIVES

This study will determine the required groundwater contribution, in terms of quantity and quality, to satisfy the basic human needs (BHN) Reserve and ecological water requirements (EWR) for the Berg catchment. The Reserve determination aims to support DWS, 2019: 121 in completing the RDM process, assist the DWS in making sound management decisions regarding stressed or over-utilised catchments, and also ensuring that water resources are afforded a level of protection that will assure a sustainable level of utilisation in the future.

QUANTIFYING THE RESERVE

The procedure for determination of the groundwater contribution to the Reserve will follow the stepwise process outlined in the RDM manuals. The procedure is divided into eight steps and is inter-linked with the Water Resource Classification System (WRCS). The WRCS is a process by which water resources are categorized into Water Resource Classes (WRCs) that account for ecological, social and economic factors that are dependent on the water resource.

8 STEP RDM PROCEDURE



STAKEHOLDER ENGAGEMENT

WHY SHOULD YOU BE INVOLVED?

The outcomes of this study will influence the management procedures of the water resources in the area and may eventually impact you or your organization as a water user. Stricter controls on groundwater may be implemented and could have bearing on future water use in your area. These controls are geared towards sustainable management of the water resource which influences all water users and aquatic ecosystems.

This is your catchment, and you are therefore encouraged to participate by commenting on information sent, attending meetings or workshops, or by corresponding with the stakeholder engagement office or the technical team at the addresses provided.

OVERVIEW OF THE STUDY AREA

The Berg catchment, which forms the main study area boundary, is located in the southwestern corner of South Africa and falls entirely in the Western Cape Province. It borders the Olifants/Doring catchment to the north and the Breede-Gouritz Water Management Area (WMA) to the east. The Berg River catchment is the largest catchment within the study area, along with smaller catchments such as the Diep, Kuils, Eerste, Sir Lowry's, Steenbras and numerous small catchments on the Cape Peninsula and West Coast, covering a total area of 13 000 km². There are 22 estuaries in the Berg catchment including the Berg River and Langebaan Lagoon estuary which receive contributions from groundwater. Several significant wetlands are of importance in the Berg catchment, namely the Edith Stevens Wetland Park, Zeekoevlei, Rondevlei, Zoarvlei and Rietvlei.

The Berg catchment experiences a Mediterranean climate with rainfall received in winter. There is a large spatial variability in mean annual precipitation due to the varying topography from low lying coastal plains (in the northwestern part of the catchment) to high mountain ranges along the eastern side of the catchment and the Cape Peninsula. Mean annual temperature are also controlled by a variety of factors such as altitude, onshore winds and latitude. Typically, temperatures are lower in the mountainous regions and increases along the coast in the low-lying areas.

The majority of the Berg catchment is underlain by the Klipheuwel and Malmesbury Group rocks which were later intruded by the Cape Granite Suite. Thereafter, a long period of uplift and erosion resulted in the deposition of sandstones which form the Table Mountain Group (TMG), particularly the Peninsula and Skurweberg formations that form the escarpments. These form deep fractured rock aquifers (Peninsula and Nardouw [Skurweberg and Rietvlei formations] Aquifers) that are often confined and high yielding with good water quality. Sediments eroded from these formations (particularly from the softer Malmesbury Group) were deposited in the western and coastal portion of the catchment to form the Bredasdorp Group, Sandveld Group and Quaternary age deposits. These sand deposits form major primary sedimentary aquifers which can be extremely high yielding but are vulnerable to contamination due to their unconfined nature and high infiltration rates.

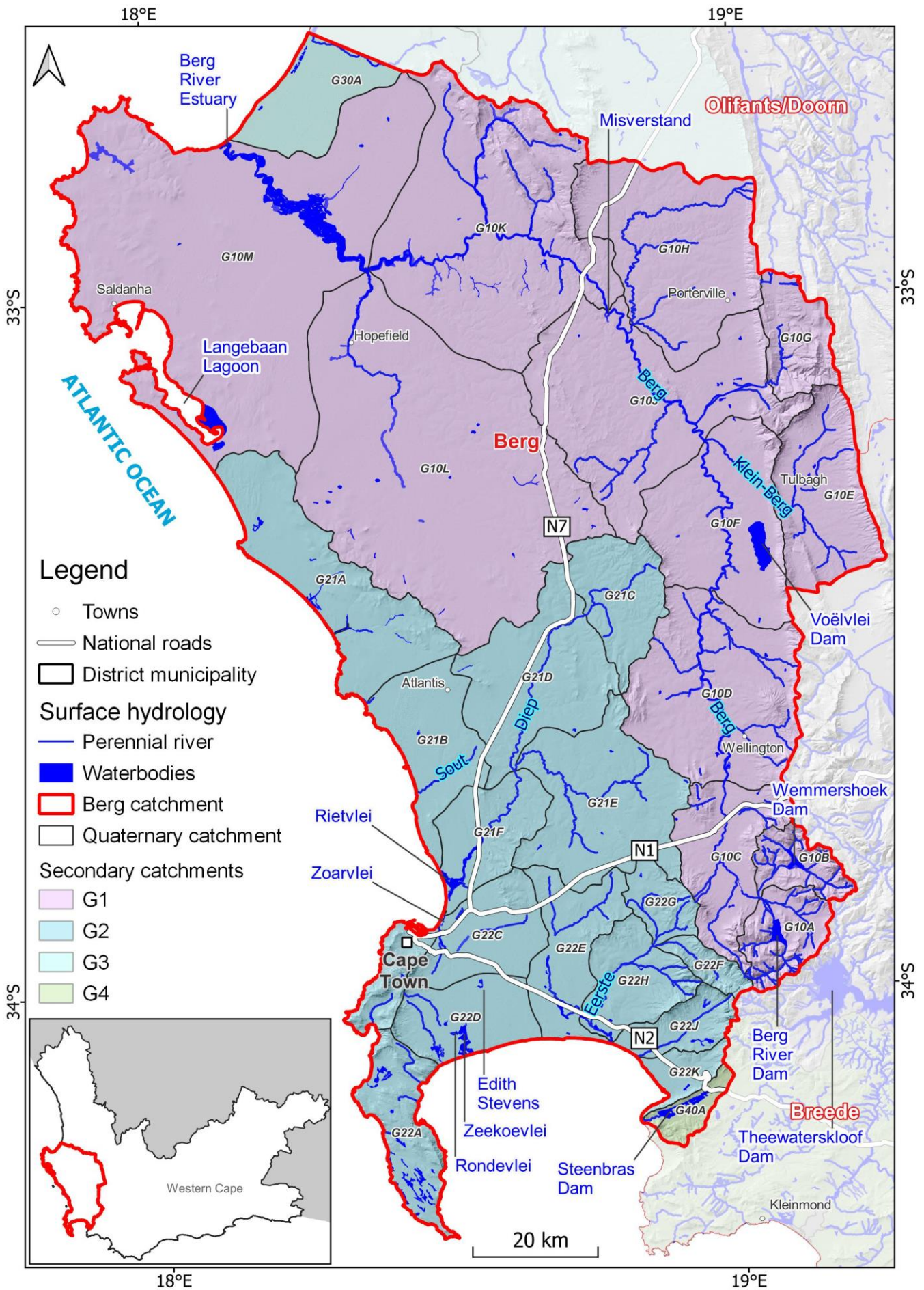


Figure 1: Locality map of the Berg catchment and preliminary extent of the study area. A broader study area extent will be considered to ensure that all GRUs are adequately evaluated (GRUs do not necessarily follow surface water catchment boundaries).

DURATION OF STUDY

The duration of the study is 24 months from date of commencement, which was in February 2022. Hence, the study completion date is end February 2024.

The study is scheduled according to the 8 steps described above with each step follow on the previous step in sequence.

PROJECT TEAM

Umvoto South Africa (Pty) Ltd will be the Professional Service Provide (PSP) and will be responsible for the execution of the study under the auspices of the DWS CD: WEM. A Project Management Committee (PMC), including members from various directorates of the DWS, was established to provide guidance and technical input. The NWA also requires that the PMC be supported by a stakeholder group with an interest in the study area. Key stakeholders were identified and will form a Project Steering Committee (PSC).

PUBLIC MEETINGS

Six PSC meetings will be held during the study, with the first meeting scheduled for 02 August 2022. The PSC is representative of all major sectors and interests within the study area and are encouraged to provide strategic advice and guidance. Comments can be sent to the Stakeholder Engagement Office, DWS Study Project Manager or the PSP team for Technical Enquiries.

PROJECT PLAN AND PROGRESS

	STEP	OUTCOME	STATUS
PHASE 1	Inception	<ul style="list-style-type: none"> Scope of work Capacity building programme Expenditure schedule & projections Stakeholder engagement planning 	Complete
PHASE 2	Data collection and collation	<ul style="list-style-type: none"> Collate, review and analyse all available, relevant data and literature pertaining to the project area in the form of a desktop assessment. 	Complete
PHASE 3	Step 1	Initiate Groundwater Reserve Study <ul style="list-style-type: none"> Complete a review of available information and data to determine the process and detail of the assessment and determination Identify relevant stakeholders to be included in the project. 	Complete
	Step 2	Water RU Delineation <ul style="list-style-type: none"> Determine eco-regions, delineate aquifer specific groundwater related RUs (GRUs), select study sites. 	In progress
	Step 3	Ecological Status and Reference Conditions per RU <ul style="list-style-type: none"> Determine the reference conditions, Present Ecological Status (PES), Ecological Importance (EI) and Ecological Sensitivity (ES) of each of the selected study sites. 	Not Started
	Step 4	Determine BHN and EWR <ul style="list-style-type: none"> Determine the groundwater component of the BHN and EWR for all GRUs delineated in the study area, supported by the ecological findings of the gazetted Water Resource Classes and RQOs. 	Not Started
	Step 5	Operational Scenarios & Socio-economic <ul style="list-style-type: none"> Review current and future operational scenarios and its socio-economic and ecological consequences. 	Not Started
	Step 6	Evaluate scenarios with Stakeholders <ul style="list-style-type: none"> Evaluate the scenarios with stakeholders where the outcome of Step 3 – Step 5 will be presented, evaluated, adjusted and agreed upon. 	Not Started
	Step 7	Monitoring Programme <ul style="list-style-type: none"> Design an appropriate monitoring programme by taking into account the hydraulic characteristics and the status of identified water resources. 	Not Started
	Step 8	Gazette & implement Reserve <ul style="list-style-type: none"> Gazetting template will be drafted, based on the results of the study 	Not Started

GLOSSARY

Basic Human Need (BHN):

The least amount of water required to satisfy basic water requirements; this is currently set at 25 ℓ/person/d.

Classification:

The classification system prescribed under the NWA provides guidelines on how to set appropriate levels of protection for water resources by taking into consideration the social and economic needs of competing interests by all who rely on the water resources.

Ecological Water Requirements:

The quantity and quantity of water of that resource that is required to maintain the said water resource in its assigned ecological category.

Groundwater Allocation:

That volume of groundwater that can be allocated for use after consideration of the Reserve and RQOs.

Resource Directed Measures:

A term used but not defined by the NWA. The objective of Resource Directed Measures (RDM) is to facilitate the proactive protection (for use) of the country's water resources, in line with sustainability principles. The NWA recognises the need to develop and use the country's water resources to grow. However, the Act also recognises that our water resources should not be used to the detriment of future users. RDM hence strives to ensure that the water resources are afforded a level of protection that will assure a sustainable level of development for the future. To this end, RDM comprises three main interrelated components, namely:

- Classification
- Reserve
- Resource Quality Objectives.

Resource Quality Objectives:

A term used but not defined by the NWA. Resource Quality Objectives (RQOs) are used to put the Classification and Reserve into practice by specifying conditions that will ensure that the Class is not compromised and the Reserve can be met. Resource quality may relate to critical flows, groundwater levels and quality that must be maintained. The objectives are to articulate goals and provide numerical and narrative descriptors of quality, quantity, habitat and biotic conditions as a basis from which management actions can be implemented for the sustainable use of all water resources. RQOs must be based on DWS policy statements and methodologies and aligned with the National Water Resource Strategy.

Significant Water Resources:

A term used but not defined by the National Water Act (1998). It relates to the size of the water resource rather than its importance. A resource is deemed to be significant if it is large enough to warrant its own Reserve determination.

The Reserve:

The NWA describes the Reserve as the quantity and quality of water required to satisfy basic human needs and to protect aquatic ecosystems, in order to secure ecological sustainable management of significant water resources. The Reserve, therefore, consists of two distinct components: (1) basic human needs (BHNs) and (2) the ecological water requirements (EWRs). The BHN component secures a basic water supply, as prescribed under the Water Services Act, 1997 (Act No 108 of 1997), for people who are now or who will, in the reasonably near future, be relying upon; taking water from; or being supplied from, the relevant water resource. The EWR component refers to the quantity, quality and variable flow required to protect aquatic ecosystem of the water resource and the sustainable management thereof.