

TERMS OF REFERENCE FOR A SOLICITED WRC PROJECT

Theme: Water Availability

Title: Design or enhance the Water Research Observatory (WRO) database to accommodate all RDM-generated data and information, including metadata, from 1999 onwards.

ToR:

1. Rationale for the Study

The DWS is responsible for implementing Chapter 3 of the National Water Act. This chapter is dedicated to the determination of Resource Directed Measures, which comprise water resource classification (management class, as informed, among other things, by ecological category results), Reserve determination (including environmental flow requirements), and Resource Quality Objectives (chemical and/or numerical) as key components in managing a water resource to meet a desired management class. All of these high-level stages involve extensive data collection, leading to Reserve determination at significant cost. The process is central to water resource development and ensures the sustainable provision of water for human and environmental needs as a priority. The Act requires the Minister to determine the Reserve before water use authorisation can be approved, in order to avoid the degradation of ecosystem services downstream. Many rivers in the country have had their Reserves determined since the methods were developed more than 20 years ago. However, most, if not all, of the data and information collected are not readily available or securely stored in a dedicated database where metadata and all related information can be accessed when required. This challenge became more prominent during the update of the 2014 PES/EIS project, completed in March 2026. The study teams struggled to access data, if it was available at all, because it remains with experts (service providers) contracted by the DWS and/or WRC to conduct historical studies and Reserve determinations. Arising from the challenges experienced during the 2026 updated PES/EIS report, the DWS, in consultation with the WRC, agreed on the urgent need to develop or enhance existing big data software, such as the Water Research Observatory, to harvest RDM data dating back to 1999 and store it for all water resource types as defined in the NWA. The process will also include capacity building for dedicated DWS staff who will continue to harvest the remaining data and information generated through Reserve determinations, classifications, and RQO-related activities, and who will sustain the database. Therefore, the costing of operations and maintenance will form part of the database enhancement or development. If this opportunity to consolidate the data is delayed, the risk of paying again for data that has already been paid for will intensify over time, together with the loss of institutional memory.

2. Main Objective

The overall aim of the call is to enhance or develop a reliable database not only for archiving data, but also for applying analytical intelligence as part of the broader digital transformation going forward. The database should be accessible to managers, service providers, academics and other stakeholders who require such data for decision-making, including in WULA, EIA and other similar authorisation processes.

Specific Objectives

- Revisit all data sources, including spreadsheets, software and models, as well as methods and guidelines developed from as far back as 1999 to date, including metadata.

- Harvest as much data and information as possible generated over the years from Reserve determinations, water resource classifications and Resource Quality Objectives, for the purpose of developing appropriate specifications for the WRO and capturing them in the database.
- Test the artificial intelligence capabilities of the WRO to handle and provide assessments and reporting as required by the client from time to time, including during updates of PES/EIS.
- Build the capacity of dedicated DWS staff to continue data consolidation, and the operation and maintenance of the WRO or any selected alternative database.

4. Deliverables

The following are some of the deliverables expected from the project:

1. A compendium of decision-support documents related to methods, procedures, models, software and guidelines developed through DWS/WRC-funded projects.
2. Data and metadata harvested from documents produced since the initiation of the RDM studies.
3. An enhanced WRO big data platform, tested with internal and external clients for data accessibility, assessment and reporting where necessary.
4. DWS staff trained in the use and maintenance of the WRO.

Budget: R1 000 000

Year 1: R300 000

Duration: 3 years