DRAFT TERMS OF REFERENCE FOR A DIRECTED WRC PROJECT

KSA 1&2:	**Water Resources and Ecosystems**
THRUST 2:	**Hydrological and Ecosystem Processes**
PROGRAMME 2:	**Data and Hydro-informatics**
TITLE:	**Updating of the 2011 Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS) Database with reference to the Enhancement of the PES & EIS Model/Spreadsheet Database and Specialist Support to the Study Groups.**

Objectives:

General:

Updating South Africa's 2011/2014 PES and EIS Database for Primary, Secondary Catchments on a Sub-Quaternary Reach Scale (SQRS).

Specific:

Enhancement and setting up of the PES & EIS Model/Spreadsheet Database and its supporting User Manual, and consolidation of PES & EIS Reports and Databases. Some specific objectives will include:

1) **Preparing the baseline PES & EIS Model/Spreadsheet with the required overlays using e.g. Excel 365 and Google Earth Pro to:**
   - KML files (landcover information, groundwater status and condition information, mainstems and tributaries, instream wetlands and estuaries in the SQR)
   - establish a metric rating system related to SQR based on the 2011/201 approach.
   - provide guidance on the scientific naming convention for fish and macro invertebrate taxa.
   - ensure that coding of the data complies with internal and external data quality and legal standards for data accreditation requirements.
   - develop a comprehensive User Manual for the updated 2025 PES & EIS Model/Spreadsheet.
   - etc
2) Provide technical support and training to the Study Area Groups on the use of PES & EIS Model/Spreadsheet
3) Review of documents and technical processes related to populating the 2022/2025 PES/EIS Database.
4) Work with a model developer to set parameters for developing a future PES & EIS Modelling system
5) Maintenance of the PES & EIS Database for 12 months after the completion of the study (2025 to 2026)

Background:

The availability of water resources in South Africa is shrinking in terms of quantity and quality due to increasing requirements and the vastly changing land uses. This reality necessitates the close management of natural resources and specifically water resources in a holistic manner and continuously monitoring from source to sea.

Section 24(b) of the Constitution places the responsibility on the government to make *use of reasonable legislative and other measures to protect the environment* (specifically to prevent pollution and ecological degradation, to promote conservation, and to secure ecologically sustainable development). Chapter 3 (Section 14-17) of the

National Water Act (NWA) assigns the right to water use only to (a) basic human needs (BHN) and (b) environmental water requirements (EWR) which together are expressed as the Reserve (the quantity and quality of the freshwater that is required to ensure the maintenance of the natural functioning of the riparian vegetation and the instream biota and habitat.

Chapter 3 of NWA further obligates the government to determine the Class, set Resource Quality Objectives (RQOs), and determine a suite of associated Reserve categories and ecological configurations for significant water resources in the related Sub-Quaternary Reaches (SQRs). This study is largely focusing on the Ecological Water Requirements (EWRs) that are expressed in terms of the Present Ecological State (PES), the water resource's Ecological Importance (EI) and Sensitivity (ES) together expressed as the (EIS). The aim further, is to derive (if not already done by means of higher confidence Reserve studies) the Recommended Ecological Category (REC) at a representative point in a river reach or at a fixed representative point in the water resource. These EWRs parameters (PES, EIS and REC) represent the baseline information set, that is required for various legislative environmental processes, and they must be regularly updated.

Therefore, the main objective of this study is to assist the updating of the 2011/2014 PES & EIS Database by enhancing the Model/Spreadsheet that curated information for the main rivers in 1946 Quaternary Catchments in South Africa, and to provide specialist/technical support to the five (5) Study Area Groups that will collect the information. The five (5) Study Area Groups will focus largely on primary, secondary and quaternary catchments and should include the significant water resources in the proclaimed **strategic water resource areas** on sub-quaternary reaches (SQRs) level which include the associated lotic wetlands i.e. floodplain wetlands, channelled valley bottoms and estuaries situated in the SQR. The wetlands database will be addressed in detail where e.g. seeps, unchanneled valley bottoms, pans and lakes that are not connected to a river. A standardised approach for obtaining and reflecting the latter mentioned information will be provided, assessed and the approach agreed upon during the inception phase.

Proposals are therefore invited for a Specialist/Technical PES & EIS Model/Spreadsheet developer to enhance the PES & EIS Model/Spreadsheet for curating the information that will be collected by the Study Area Groups that are described in Table 1 of the associated TOR. The Model/Spreadsheet developer will also provide guidance and technical support to the five (5) Study Groups as well as consolidating their Databases and technical reports into a single report and PES & EIS Database. The recommended software for the Model/Spreadsheet enhancement is the *Excel 365* and *Google Earth Pro 5*.

The work of the Model/Spreadsheet developer will largely run simultaneously and synchronously with the five (5) Study Area Groups that will update the 2011/2014 PES & EIS Database. A budget of R500 000.00 must allocated for capacity building over the duration of the study.

Suggested Deliverables with suggestive target dates:

1. Guidance report on the approach to updating the PES & EIS Database – September 2022
2. Technical Report 1 on the support to the Study Area Groups on the use of PES & EIS Model/Spreadsheet – October 2022
3. Review and Training report on populating the 2022/2025 PES/EIS Database – November 2022.
4. Interim Report with updated database, PES & EIS Model/Spreadsheet and GIS maps - 2023.
5. Technical Report 2 on the support to the Study Area Groups on the use of PES & EIS Model/Spreadsheet - 2023
6. Capacity Building Report for the Main Users of the PES/EIS Database (2024)
7. Proposed Coding for future PES & EIS system - 2024
8. Consolidated Print-Ready Final Report, User Manual and Updated Integrated PES/EIS Database and GIS maps (2025).
9. Maintenance of the PES & EIS Database for 12 months after the completion of the study (2025 to 2026)
10. A close-out report on the 2025 PES & EIS Database (2026)

Timeframes: **2022 to 2026**

Total Budget: **R2 565 000.00**

Budget Breakdown

YEAR 1	760 000
YEAR 2	827 000
YEAR 3	578 000
YEAR 4	400 000
TOTAL	**2 565 000**