

DETAILED SPECIFICATION TO BE CAPTURED ON SBD 3.1**1. ADMINISTRATIVE REQUIREMENTS**

The Department reserves the right to request further information regarding the undermentioned criteria. Failure of a bidder to submit further clarification and or documentation within 7 calendar days from the request date or as specifically indicated shall result in the quotation offer being disqualified from further consideration.

No	Criteria	Requirement
1	Companies must be registered with National Treasury's Central Supplier Database.	Provide proof of print out from CSD.
2	Tax compliant with SARS (to be verified through CSD and SARS).	Tax compliant status
3	SBD 1, SBD 3.1, SBD 3.3, SBD 4, SBD 6.1	Complete, sign, submit SBD 1, SBD 3.1 SBD 3.3, SBD 4, SBD 6.1

2. EVALUATION CRITERIA**2.1 Mandatory criteria**

Is the Mandatory Requirement applicable? Please indicate: Yes

- If yes provide details below.

*Bidders are required to comply with the following listed below. Failure to comply with the criteria stated hereunder **shall** result in the quotation offer being disqualified from further consideration.*

No	Criteria	Requirement
1.	Details with photos of all data loggers and sensors to be supplied	Brochures
2.	A manufacturer Certificate of compliance or Letter of distribution	Attach letter or certificate.
3	Bidders are to fully comply with all requirements on Annexure A-Detailed specifications.	Tick Yes to indicate full compliance

Points awarded for Price and Specific Goals

The 80/20-point system will be used in evaluating all request below R1 million.

Evaluation element	Weighting (Points)
SPECIFIC GOALS	20
PRICE	80
Total	100

2.2 Detailed specification - Annexure A

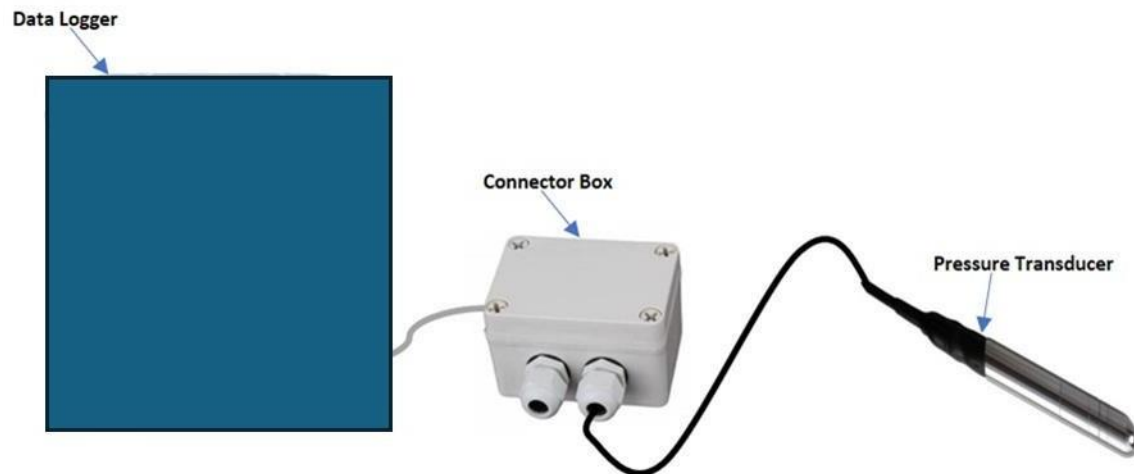
4.2.1 The details of the Specification details shall be captured on the SBD 3.1 as contained below

N.B: The following list of requirements must be complied to and confirmed failure to comply then your bid will be deemed to be non-compliant and will be disqualified.

Next to each specification a block is provided for the bidder to complete the following by indicating as below

- a. Offered equipment / item to specification - ☐ **Y** or ☐ 
- b. Offered equipment / item not to specification - ☐ **N** or ☐ **X**

A typical DWS set up of a data logger and sensor combination looks similar to the image below.



NOTE: The details below must be fully completed. Items that do not fully comply will not be accepted. (Only under Item B is the N/A symbol accepted). Brochures must be attached for each item quoted.

Table 1: Specification Compliance Requirements schedule

A Data Logger Requirements		Y/N
1	The user can connect to the data logger wirelessly or by comms cable using a laptop	
2	The user is able to configure the logger for various logging and data transmission periods	
3	The user can configure the sensor to three decimals	
4	The user can download data from the logger on site	
5	The logger is IP68 Rated, compact with internal modem and battery	
6	The logger can transmit data via GSM and GPRS	
7	High and low alarms can be set by the user on site and remotely	
8	The data logger can be configured to transmit Alarms to a server AND a sms to another cellphone number	
9	The data logger must be a single unit with an internal user replaceable battery/ batteries	
10	The internal battery must work for at least 2 years, recording data every 12 minutes and transmitting every 4 hours	
11	The logger can be configured to transmit data to the Pretoria Head Office server Zednet WaterCore	
12	Hard copies/ electronic copies of all manuals related to wiring, data retrieval and configuration of the data logger will be supplied	
13	2 day in-person training on the assembly, configuration and downloading of the data from the data logger	

B Connector/Junction Box Requirements		Y or N or N/A
1	The pre-wired connector box must be IP68 Rated	
2	If no connector box is needed, the connection between the sensor and data logger must be IP68 Rated	

C Pressure Sensor Requirements		Y/N
1	The pressure sensor measures within 0.1% of the Full Measuring Scale (FMS)	
2	The pressure sensor is a 4-20mA sensor	

D Radar Sensor Requirements		Y/N
1	The radars sensor measures within 0.1% of the Full Measuring Scale (FMS) within 2mm	
2	The radar sensor is a 4-20mA sensor	

E Contact Gauge Requirements		Y/N
1	The probe of the contact gauge is sealed from direct exposure to elements but open to water exposure	

4.2.2 Compact Data Logger IP68 capable of measuring a 4-20 mA pressure sensor and pulse sensor with internal battery, internal GSM/GPRS modem ☐

a. Application: ☐

The GSM data logging system would be installed at remote gauging stations and used for secondary real-time or backup data collection applications where water levels and rainfall is measured.

b. Design and technical details: ☐

The equipment shall be designed to function satisfactorily under the following conditions:

- Operating temperature range: -20°C to 50°C;
- Relative humidity: 100%;

Real time clock:

- The data loggers shall be equipped with battery backed hardware real time clock system.
- The real time clock system shall provide time (24-hour system) and date information.

c. Memory: ☐

The data loggers shall be provided with the following types of memory systems:

- The memory size: 512K.
- Recording Interval programmable between 1 minute and 1 hour.
- Data storage: Rotating store

d. Power supply: ☐

- Each data logger shall be provided with an internal source that would prevent equipment shutdown or loss of data when the main battery is either disconnected for a short period or exchanged. (± 12 minutes)
- Power for all the sensors will be derived from the internal main battery via the data logger for at least 2 years at an interval of 12 minutes and transmitting 4 hourly.
- The logger must have low power consumption on standby mode.
- The battery MUST be standard and easily purchased from any dealer selling batteries in South Africa. The batteries should be easily changed without the need to solder it.
- The data logger must be reverse polarity protected.

- e. Input functions and interfacing: ☐
- Programmable Input range: 0 - 40m
 - Resolution: $\pm 0.1\%$.
 - In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. Sufficient warm-up and stabilization time for sensors must be controlled by the logger.
 - Full calibration procedures shall be provided for each sensor
 - Input connectors for sensors shall be clearly labelled, shall be polarized to prevent mismatching of connectors and shall be configured so that no damage can occur if a unit is accidentally or intentionally connected to the wrong input channel. Each connector shall make provision for all the necessary signal lines, earth, 0V and 12V (switched) supplied lines.
- f. Enclosure and Housing: ☐
- Only compact data loggers will be accepted, therefore all electronic components, wiring, etc., will be inside the logger housing.
 - The data logger shall be designed to operate without degradation under dusty or condensing conditions experienced at sites.
 - The housing shall be manufactured of corrosion resistant material.
 - The data logger / communication unit housing shall not exceed the following dimensions:

- Height:	less than 200 mm;
- Width:	less than 200 mm;
- Depth:	less than 150 mm.
- g. SIM Card Compatibility and Replacement: ☐
- The data logger will permit the fitting and replacement of the SIM card by the user if needed. It should support all current forms of SIM cards in common use by GSM operators if needed.
- h. Transmission of Data: ☐
- The data logger will be programmed to initiate data transmission hourly, daily, weekly or monthly at a user selected time.
 - Data to be transmitted will be all data, which has not been previously sent, or, at the particular date and time.
 - Advanced channel profile and threshold alarms.
 - The Data Logger must also be able to be set up so that SMS alarms can be sent directly to pre-programmed cell phone numbers.

4.2.3 Sensor for water level measurement: pressure transducer: ceramic or piezo resistive with 4-20ma output; ☐

a. Application: ☐

- The submersible pressure transducer will be used for hydrostatic water level measurement and will be measuring pressure using a vented cable.
- Pressure transducers must be capable of measuring water levels from 0 - 100 m, the range of each transducer being determined by the Department and pre-set in the factory. Typical ranges could be: 0 - 1 m; 0 – 2.5 m; 0 - 5 m; 0 – 10 m; 0 – 20 m, 0 – 30 m and >40 m on request.
- The pressure transducers must have a high reliability and ensure a large range of application for pressure measurement in all fields of water level measurement.

b. Design and technical details: ☐

Pressure Transducer housing:

- The housing must be in an all-sealed enclosure and the pressure port must be vented to the atmosphere using a vented cable.
- The transducer housing must be robust, corrosion-resistant, insensitive to impact and vibration and watertight up to at least 70 m of water column. (>70 m on request).
- The opening to the sensor must be protected by a removable cap to allow for maintenance.
- The transducer housing shall preferably not exceed the following dimensions and weight:
 - Length: 500 mm
 - Diameter: 50 mm
 - Weight: 1 kg
- The transducer housing can be fitted with a watertight plug for connection to the transducer cable.

c. Pressure Transducer sensor: ☐

- The submersible pressure transducer sensor must be based on a piezo-resistive ceramic pressure sensor element.
- The measuring cell must be chemically and thermally resistant.
- The pressure sensor must have a compensated operating temperature range of -5°C to +70°C.
- The sensor should be calibrated, temperature compensated and provide amplified analogue output signals for 4-20mA output.

- The sensor should have a supply voltage of between 9 to 32V and must have reverse polarity protection.
- The sensor must have a response time of maximum 35 ms with a power consumption not exceeding 250mW. Typical sensor warm-up time must not exceed 10 seconds.
- The sensor proof pressure must be two times the rated pressure range. Proof pressure is the maximum pressure which may be applied without causing damage to the sensing element.
- The pressure sensor must have surge immunity according to EN 61000-4-5 for current output devices with cable lengths longer than 10m.

d. Measuring Accuracy of the Pressure Transducer Sensor:

☐

- The sensor's Non-linearity (Best Straight Line fit), hysteresis (maximum output difference at any point within the operating pressure range for increasing and decreasing pressure) and repeatability must be 0.1 % FSO (Full Scale).

e. Vented transducer cable:

☐

- The vented cable is factory fitted to the submersible pressure transducer housing and the length of cable for each submersible pressure transducer are being determined by the Department during procurement.
- The pressure transducer and transducer cable shall be designed to function satisfactorily with a cable length of up to 200 m.
- Flexible with Polyurethane jacketing material for corrosive media and maximum outer diameter 12 mm.
- Double sheathing with interposed tinned copper- braiding shielding with polyester with polyester film to cover the vented tube and all connectors.
- There must be filler between the conductors and vent tube and all conductors must be of tin copper.
- A polyamide pressure-compensation capillary tube for measuring the reference pressure, with an inside diameter of preferably 3 mm, but not less than 1,0 mm.

4.2.4 Sensor for water level measurement using a radar for 15m and 30m range and 4-20 ma output signal ☐

a. Application ☐

- The radar level sensor will be used for water level measurement and will be mounted above the water surface to measure the distance to the water surface and provide the invert for water depth.
- The radar level sensors will be used in locations where a measuring range from 0-15m or 0-30 m would be required.

b. Design and technical details: ☐

Measuring Accuracy of Radar Level Sensor:

Measuring Range:	Up to 15m	Up to 30m
Deviation:	≤ 2mm	≤ 2mm
Beam Angle:	8°	4°
Output Signal:	4-20mA	4-20mA

c. Radar Sensor Housing ☐

- The housing must be in an all-sealed enclosure, and the sensor must have an integrated cable with encapsulated cable gland.
- The housing must be robust, corrosion-resistant and insensitive to minor impact and vibration.
- The housing shall not exceed the following dimensions and weight to allow for installation in existing enclosures:

Length: 150 mm

Diameter: 100 mm

Weight: 1.5 kg (without integral cable)

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d. Radar Sensor ☐

- The sensor should allow for maintenance free operation and make use of 80 GHz technology.
- The sensor should be unaffected by ambient conditions and provide very good signal focussing to allow for versatile installation positions.
- The sensor must have a two-wire configuration with output signals for 4-20mA output.
- The sensor should have an operating voltage of between 12 to 35V DC.
- The sensor must be able to achieve a stable output reading with a typical sensor warm-up time of 15 seconds.
- Bluetooth interface, version 5.0 with 25 range
- Operating voltage 12 – 35 V DC

e. Radar Sensor Mounting Equipment ☐

- The radar sensor shall be supplied with a standard stainless steel mounting bracket from the Original Equipment Manufacturer (OEM).
- The system shall include an OEM-manufactured L-shaped stainless steel mounting arm measuring 300 mm × 2000 mm, designed to provide adequate beam path clearance.
- The mounting arm shall be capable of swinging to the side to facilitate maintenance and shall be designed to withstand both wind loads and the dead weight
- The standard OEM mounting bracket shall allow for easy and secure attachment to the mounting arm.

4.2.5 Bi-directional communications cable with USB serial port ☐

- The user must be able to use this cable to connect to, configure and download data from the data logger described in 4.2.2.

4.2.6 2-day in-person training on assembly, configuration and downloading data from the data logger ☐

- The training date will be agreed upon by the supplier and end user after the delivery of all the items.
- The training venue will be at departmental premises in Potchefstroom or Boskop, North West province.
- The documentation related to the training and all software products must be shared electronically prior to the training date.
- The training must be facilitated by a person knowledgeable and experienced in all the technical aspects of the instrumentation.
- The training will involve installation of all necessary software and drivers on all technical personnel laptops.
- The facilitator must demonstrate how to connect the data logger to the various sensors, configurations and downloading.
- One outcome of the training is that the senior technical personnel must be able to demonstrate how to assemble, configure and download data from the data logger.
- A second outcome is that the less experienced personnel must be able to demonstrate how to download data from the data logger.
- The training will involve basic fault finding.
- A pdf attendance certificate must be provided for each candidate who attended the full 2-day in-person training.

Table 2: Table of Quantities

NO.	DESCRIPTION	QUANTITY	PRICE
4.2.2	Compact Data Logger IP68 with connector box (wired to each channel) with three channels of which two channels are dedicated 4-20 mA and one channel for pulse measurement (rainfall), have an internal battery and internal modem	15	
4.2.3 (a)	Sensor for Water Level Measurement: Pressure Transducer: ceramic or piezo resistive with 4-20mA Output (0-1m range) With 5 m length vented cable	2	
4.2.3 (b)	Sensor for Water Level Measurement: Pressure Transducer: ceramic or piezo resistive with 4-20mA Output (0-5m range) With 5 m length vented cable	6	
4.2.3 (c)	Sensor for Water Level Measurement: Pressure Transducer: ceramic or piezo resistive with 4-20mA Output (0-5m range) With 10 m length vented cable	1	
4.2.3 (d)	Sensor for Water Level Measurement: Pressure Transducer: ceramic or piezo resistive with 4-20mA Output (0-5m range) With 30 m length vented cable	1	
4.2.3 (e)	Sensor for Water Level Measurement: Pressure Transducer: ceramic or piezo resistive with 4-20mA Output (0-10m range) With 10 m length vented cable	3	
4.2.3 (f)	Sensor for Water Level Measurement: Pressure Transducer: ceramic or piezo resistive with 4-20mA Output (0-20m range) With 25 m length vented cable	1	
4.2.3 (g)	Sensor for Water Level Measurement: Pressure Transducer: ceramic or piezo resistive with 4-20mA Output (0-30m range) With 30 m length vented cable	1	
4.2.4 (a)	Sensor for Water Level Measurement: Radar range maximum of 15m with 4-20mA Output with mounting arm	1	
4.2.4 (b)	Sensor for Water Level Measurement: Radar range maximum of 30m with 4-20mA Output with mounting arm	1	
4.2.5	Bidirectional communication cables with USB serial port for ITEM NR 4.2.2	4	
4.2.6	2-day in-person training on assembling, configuring and downloading data from the data logger and sensors	1	
	TOTAL COST		

