

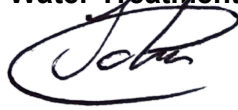


	Technical Specification	Unique Identifier	
		Revision	0
		No of page	1 of 6
		Lethabo Power Station	

<p>Title: Technical Specification and Evaluation criteria for supply of the following instrumentation</p> <ol style="list-style-type: none"> 1. Humidity and Relative air humidity analyzer 2. Magnetic stirrer with hot plate 3. Potable Conductivity after cation removal and Degassed Conductivity after cation removal analyzer 4. Potable Hydrogen dew point analyser 5. Potable conductivity meter (Boiler Lab) 6. Infrared thermometer 7. UV/VIS Spectrophotometer 8. Water Chiller suitable for use with ICP-OES Instrument 9. COD Reactor Block 10. UPS (Uninterruptible Power Supply) Unit 11. Electronic Analytical Balance 12. INLINE TUBE EXTRACTION FAN 13. Benchtop Alkalinity and conductivity analyzer 14. Portable Turbidity meter 15. Portable conductivity meter (WTP) 16. Portable DO (dissolved oxygen) meter 17. Portable COD (chemical oxygen demand) meter 18. Portable Sulfuric Acid concentration meter 19. Portable Sodium Hydroxide Concentration meter 20. Portable SDI (silt density index) meter 21. Peristaltic chemical dosing pumps 22. FOG (Fuel, Oil and Grease) Analyzer 	<p>Document type:</p> <p>Technical Specification and Evaluation criteria</p>
<p>Compiled by:</p> <p>Senior Chemist Chemistry</p> <p>Chemical Services</p> <p> 05-03-2026</p> <p>Senior Supervisor Chemistry</p> <p>Chemical Services</p> <p> 05-03-2026</p> <p>Supported by:</p> <p>Engineer Prof Engineering</p>	

	Technical Specification	Unique Identifier	
		Revision	0
		No of page	1 of 6
		Lethabo Power Station	

Water Treatment Plant



2026/03/06

	Technical Specification	Unique Identifier	
		Revision	0
		No of page	1 of 6
		Lethabo Power Station	

CONTENTS

	Page
1. TECHNICAL SPECIFICATION.....	4
2. FUNCTIONALITY: (TECHNICAL EVALUATION)	13
3. TECHNICAL EVALUATION SCORING METHODOLOGY: SUPPLY OF INSTRUMENTATION	15
3. TECHNICAL ITEMS TO BE REQUESTED WITH TENDER (List of items)	17

	Technical Specification	Unique Identifier	
		Revision	0
		No of page	1 of 6
		Lethabo Power Station	

1. TECHNICAL SPECIFICATION

1.1	Material	Specification
	1) Potable Relative air humidity analyzer	<p>Application: for determination of humidity and air temperature in ventilation ducts with precise calculation of dew point, wet bulb temperature and absolute humidity.</p> <p>Specification:</p> <p>Humidity and temperature probe with Bluetooth Humidity measurement range 0 to 100% relative humidity Relative humidity accuracy $\pm 2\%$ Temperature of up to 70°C Temperature accuracy $\pm 5^{\circ}\text{C}$ Instrument must be equipped with air velocity measurements.</p> <p>Power requirements:</p> <p>Use of batteries/ rechargeable</p> <p>Safety:</p> <p>certified intrinsically safe for use in hazardous environments. IP 66 / NEMA 4X</p>
	2) Magnetic stirrer with hot plate	<p>Application and description</p> <p>Aluminium magnetic stirrer with a hot plate Adjustable electronic motor speed control with speed feedback. The top should be constructed from high chemical resistance material Continuous variable heat control by means of energy regulator. Heater indication lamp Front panel on and off switch</p> <p>Specification:</p> <p>Speed range (rpm): 60 – 2000 Temperature range: up to 420°C</p>

	Technical Specification	Unique Identifier	
		Revision	0
		No of page	1 of 6
		Lethabo Power Station	

		<p>Stirrer capacity: 5L Power supply: 230v/50HZ Power rating @230V : 600W Plate size: 190 mm × 190 mm Material: ceramic corrosion resistance/ 304 stainless steel</p> <p>Power requirements:</p> <p>External AC to DC converter. Voltage and Frequency (Hz) selected automatically, 100–240 volts, 50–60 Hz. RSA power</p>
	<p>3) Potable Conductivity after cation removal and Degassed Conductivity after cation removal analyzer</p>	<p>Application: Monitoring specific conductivity, cation conductivity after a cation exchanger and Degassed conductivity after a reboiler in water-steam cycle. pH calculation of pH and alkalizing agents based on conductivity measurements</p> <p>system should be mounted on a stainless-steel panel that is on a movable trolley.</p> <p>Reboiler should be enclosed</p> <p>Specifications:</p> <p>conductivity measurements from 0.055 uS/cm to 1000 uS/cm</p> <p>Calculation of pH value in the range from pH 7.5 to 11.5.</p> <p>Calculate alkalizing reagent concentration.</p> <p>Accuracy: accuracy of ± 1%</p> <p>Temperature compensation:</p> <p>Power requirements:</p> <p>External AC to DC converter. Voltage and Frequency (Hz) selected automatically, 100–240 volts, 50–60 Hz. RSA power</p> <p>Safety:</p> <p>certified intrinsically safe for use in hazardous environments.</p> <p>IP 66 / NEMA 4X</p> <p>No data loss after power failure, all data is saved in non-volatile memory.</p> <p>Overvoltage protection of in- and outputs.</p>

	Technical Specification	Unique Identifier	
		Revision	0
		No of page	1 of 6
		Lethabo Power Station	

		Galvanic separation of measuring inputs and signal outputs.
	4) Potable Hydrogen dew point analyser	<p>Application: Potable hygrometer for quick reliable dew point and trace moisture content measurements in a power hydrogen cooled generator. Instrument must be reliable and accurate.</p> <p>Specification</p> <ul style="list-style-type: none"> • measurement ranges available from -100 °C to +20 °C dewpoint, with good repeatability • Calibration Certificate traceable to National & International Humidity Standards • Accuracy ± 2 °C (± 3.6 °F) dewpoint • Integral calculator to display pressure dewpoints. Gauge pressure can be entered in kPa • Temperature compensated for operating range • Sample Flow Rate independent <p>Power supply:</p> <p>Rechargeable battery for stand-alone operation with operation time of more than >24 hours</p> <ul style="list-style-type: none"> • 220VAC 50Hz for recharging • 9 V DC battery • Charging time more than 100 hrs <p>Safety:</p> <p>certified intrinsically safe for use in hazardous environments. IP 66 / NEMA 4X</p>
	5) Potable conductivity meter (inline sampling)	<p>Application: for measurements of specific conductivity in pure water and ultrapure.</p> <p>Specification:</p>

	Technical Specification	Unique Identifier	
		Revision	0
		No of page	1 of 6
		Lethabo Power Station	

		<p>Conductivity sensor /probe that has integrated pH probe Conductivity measurements range 0.055- 30 mS/cm Accuracy $\pm 2\%$ Adjustable sample flow rate with sample cell Temperature compensation</p> <p>Panel</p> <p>Instrument to be mounted on the panel with cast aluminium case</p> <p>Power requirements:</p> <p>Rechargeable battery for stand-alone operation with operation time of more than >24 hours · 220VAC 50Hz for recharging · Li-ion battery · Charging time 6 h</p> <p>Safety: certified intrinsically safe for use in hazardous environments. IP 66 / NEMA 4X</p> <p>No data loss after power failure, all data is saved in non-volatile memory. Overvoltage protection of in- and outputs. Galvanic separation of measuring inputs and signal outputs.</p>
	6) Infrared thermometer	<p>Infrared Thermometer with automatic dew point calculation/ relative air humidity</p> <p>application</p> <p>Surface temperature measurement Core temperature measurement with penetration probe Humidity measurements Process monitoring</p> <p>Specification</p> <p>Temperature range: up to 500 °C Temperature accuracy: ± 2 °C Relative humidity measurement range: 1% to 99% Response time: < 10 s</p>

	Technical Specification	Unique Identifier	
		Revision	0
		No of page	1 of 6
		Lethabo Power Station	

		Power requirements Use of batteries/ rechargeable Safety certified intrinsically safe for use in hazardous environments. IP 66 / NEMA 4X
	7) UV/VIS Spectrophotometer	Wavelength measuring range: Vis Min 30 nm and max 1100 nm UV Min 190 nm and max 320 nm Lamp type: Tungsten halogen lamp, UV lamp or Xenon flash lamp Spectral Bandwidth: 1.8 nm to 4 nm Screen Display: touch screen colour display Cell size compatibility: 10,20,30 mm rectangular cells and 16mm round cell Power Supply: 220-240V DC
	8) Water Chiller suitable for use with ICP-OES Instrument	Nominal cooling Capacity: Min 1.4kW to 1.5kW Water temperature outlet: Min 16°C and Max 22°C Water Pressure: 3.5 Bar Water Flow: Min 10 l/Min and Max 12 l/Min Power Supply: 220-240V DC
	9) COD Reactor	Sample Capacity: 25 Vials Temperature heating range: Min 30°C and Max 170°C with variable temperature control function and display Power supply: 220-230 V
	10) UPS (Uninterruptible Power Supply) Unit	UPS Type: Online UPS Power Output: 6kVA
	11) Electronic Analytical Balance	Capacity: 0-200g Readability: Min 0.0001g Repeatability: ±0.1mg Linearity Deviation: 0.2mg or better Stabilization time: <5 seconds Weighing pan: 8-10 cm Power supply: 220-240V Balance glass/plastic housing dimensions: 340x215x350 mm Stability function: level indicator and Level key knob to adjust the balance level.

	Technical Specification	Unique Identifier	
		Revision	0
		No of page	1 of 6
		Lethabo Power Station	

		The balance to be supplied with a Calibration certificates from an ISO 17025 accredited laboratory
	12) INLINE TUBE EXTRACTION FAN (for use with ICP-OES)	Power requirements: 130-150W Power Supply: 220-230V Wind Flow: 900-1000 m3/h Pressure: min 380Pa but <400Pa Revolution: min 2600rpm but <3000rpm
	13) Benchtop Alkalinity and conductivity analyzer	Titration Types: Potentiometric amperometry, colorimetric Titration Modes: Sample, blank, sample with blank Parameter: mV/pH, Conductivity, Temperature Resolution: mV/pH: ± 0.1 mV / ± 0.001 pH, Conductivity: ± 0.5 % of reading Sample Stand: can accommodate 12 beakers, auto titrator Power Requirements (Voltage): 240 V Languages: English (must) and other Electrode: Robust pH meter suitable water application (7-50°C), conductivity probe. Burette: must have burette for titrant (NH3) Operating Interface: must have operating interface and able to store data. Calibration Curves Display: be able to display calibration curves
	14) Portable Turbidity meter (hand-held)	Application: Portable instrument designed for field and/or lab use to measure different types of water includes but not limited to raw, clarified, portable, de-ionised, cooling water and wastewater Specification: Turbidity Light Detector: Infrared LED Turbidity Range: 0 to 4000 NTU Accuracy: ± 5 % Operating temperature: 0-50 °C Power requirements: Use of batteries/ rechargeable

	Technical Specification	Unique Identifier	
		Revision	0
		No of page	1 of 6
		Lethabo Power Station	

	15) Portable conductivity meter (Hand-held)	<p>Application: for measurements of specific conductivity in pure water and ultrapure.</p> <p>Specification:</p> <p>Accessories: Conductivity sensor /probe</p> <p>Conductivity measurements range: 0.055 μS/cm - 30 mS/m Accuracy: \pm 2%</p> <p>Panel/casing: Water and dust proof casing</p> <p>Power requirements: Use of batteries / rechargeable</p>
	16) Portable DO (dissolved oxygen) meter: hand-held	<p>Specifications: Range: from 0-20 ppm</p> <p>Panel/casing: Dust and waterproof</p> <p>Power requirements: Use batteries or rechargeable</p> <p>Accessories: Probe and cable</p> <p>Accuracy: +- 1.5 %</p> <p>Temperature range: -5 °C- 50 °C</p>
	17) Portable COD (chemical oxygen demand) meter; hand-held	<p>Application: Measure the amount of oxygen required for the oxidation of all the organic compounds present in the water sample. Testing of organic matter wastewater output as biochemical oxygen demand (BOD) or chemical oxygen demand (COD)</p> <p>Specification:</p> <ul style="list-style-type: none"> • Enclosure robust, compact, watertight, and dustproof • Measuring Range: 50-2000 mg/L • Temperature range: 0-150°C

	Technical Specification	Unique Identifier	
		Revision	0
		No of page	1 of 6
		Lethabo Power Station	

		<ul style="list-style-type: none"> • Cell size compartment: 16mm round cell • Light Source: UV LED <p>Power supply:</p> <p>Rechargeable battery Powered from a battery pack and battery charger power supply supplied with the field meter.</p>
	18) Portable Sulfuric Acid concentration meter	<p>Application: To measure acid concentration to verify acid strength during regeneration</p> <p>Specification:</p> <ul style="list-style-type: none"> • Sample suitability: for movable liquid, viscous liquid, volatile liquid, corrosive liquid, high temperature liquid and suspended liquid • Sulfuric acid concentration range: 0.0-100.0%, • Temperature range: 0~99.9°C • Density range: 0.001—99.999g/cm³ • Temperature Compensation Coefficient Range: (0.00001~9.99999)/ °C <p>Power supply:</p> <p>Rechargeable / Batteries</p>
	19) Portable Sodium Hydroxide Concentration meter	<p>Application: Measure caustic strength for Regens verifications</p> <p>Specification:</p> <ul style="list-style-type: none"> • Sample suitability: for movable liquid, viscous liquid, volatile liquid, corrosive liquid, high temperature liquid and suspended liquid • Density resolution for AU-300L, AU-300LM: 0.001g/cm³ • Measurement range: 0.001-99.999g/cm³ • Sodium Hydroxide concentration range: 0.0-100% • density range: 0.001—99.999g/cm³ • temperature range: 0~99.9°C

	Technical Specification	Unique Identifier	
		Revision	0
		No of page	1 of 6
		Lethabo Power Station	

		Power supply: Rechargeable /batteries
	20) Portable SDI (silt density index) meter	Application: Silt density index test for Reverse Osmosis Systems and Ultra Filtration Systems Specification: <ul style="list-style-type: none"> • Membrane Filter Discs for Silt Density Index Testing: 0.45 Micron • Test Kit: performs SDI 5-, 10- and 15-minutes tests with both 100 ml and 500 ml sample size. • Feed pressure range: 240kpa-700 Kpa • Temperature range: 40 °C – 60 °C Accessories: <ul style="list-style-type: none"> • Replacement 50 Micron Filter for the Built-In Pre-Filter Power requirements: Use of batteries/ rechargeable Cover: Dustproof and waterproof
	21) Peristaltic chemical dosing pumps	Application: Peristaltic chemical dosing pumps for emergency dosing of ferric and or poly Specification: Supply power 100-240V 50/60Hz AC Flow range 0.1 - 500 ml/min Speed range 0.01 - 65 RPM Max. discharge pressure 7 bar operating temperature 4 - 45°C Safety: Must have secure mounting for easy integration into pump systems.

	Technical Specification	Unique Identifier	
		Revision	0
		No of page	1 of 6
		Lethabo Power Station	

	22) FOG (Fuel, Oil and Grease) analyzer for effluent water samples	Specification: Power supply: 220-230v/50HZ AC Measurement: infrared wavelength suitable for low concentration Filter size: 1-4 microns Sample suitability: effluent water samples
1.2	Additional Requirements	
	<ul style="list-style-type: none"> The equipment must be calibrated prior delivery (calibration certificates to be provided) Supplier to provide face-to-face training upon delivery/installation of the equipment (letter from OEM confirming training to be provided upon delivery/installation or a letter confirming the supplier has been trained and found competent by the OEM to provide the training) 	

2. FUNCTIONALITY: (TECHNICAL EVALUATION)

EACH INSTRUMENT WILL BE EVALUATION SEPARATORY.

Gatekeeper applicable to the below listed four analysers

The supplier to provide proof that the tendered equipment is certified intrinsically safe for use in hazardous environments and comply to IP 66 / NEMA 4X rating for the following four analysers. No further evaluation will be conducted if the IP 66 / NEMA 4X rating is not indicated on the instrument technical data sheets provided.

- **Potable Relative air humidity analyzer**
- **Potable Conductivity after cation removal and Degassed Conductivity after cation removal analyzer**
- **Potable Hydrogen dew point analyser**
- **Infrared thermometer**

The supplied Equipment must comply with technical specification as listed in section 1.1 (supplier to provide technical Data sheet of the equipment) and 1.2 above The equipment data sheet to contain the following additional information: Technical Data Sheets	40*
---	-----

	Technical Specification	Unique Identifier	
		Revision	0
		No of page	1 of 6
		Lethabo Power Station	

<ul style="list-style-type: none"> Detailed specifications for each piece of equipment offered. Include model number, manufacturer, dimensions, power requirements. Include environmental operating requirements such as temperature, humidity Details of user interface and accessories required. 	
Original Equipment Manufacturer (OEM) to be accredited to ISO 9001 (provide accreditation certificate)	10
<p>Suppliers must provide after sales technical support (if supplier is not OEM, supply letter from OEM confirming after sales support which includes maintenance and calibration)</p> <p>If supplier is an OEM, provide Manufacture's declaration letter for the equipment or analyser</p> <p>Letters provided by OEM and Non-OEM should cover the following:</p> <ul style="list-style-type: none"> Warranty duration and coverage (please specify). Recommended list of critical spare parts. Availability of spare parts and consumables in the country/lead time of spares. Suggested maintenance schedule of the equipment Obsolescence statement indicating the expected product lifecycle and confirming the number of years the offered equipment will remain supported and available from the date of delivery 	30*
<ul style="list-style-type: none"> Provide three (3) Contactable and verifiable client references of previous supply of same or similar instruments for the same or similar sample matrices. (each reference must be contacted and verified successfully before they are accepted as valid). Include contact details for verification. If supplied to Eskom please provide valid order numbers 	20

	Technical Specification	Unique Identifier	
		Revision	0
		No of page	1 of 6
		Lethabo Power Station	

3. TECHNICAL EVALUATION SCORING METHODOLOGY: SUPPLY OF INSTRUMENTATION

			SCORING GUIDELINES						
Percentage		0	5	10	15	20	30	40	
40*	3.1	Equipment to be supplied does not comply to technical specification as listed in section1.1 and 1.2 above	-	-	-			Equipment to be supplied comply to technical specification as listed in section1.1 and 1.2 above	
10*	3.2	Original Equipment Manufacturer is not accredited to ISO 9001 or any other recognized international standard	-	Original Equipment Manufacturer is accredited to ISO 9001 or any other recognized international standard	-	-	-	-	
30*	3.3	After sale technical support, not offered. No letter provided from OEM confirming after sales support	-	-	-	-	After sales technical support is offered, if supplier not OEM please supply letter from OEM confirming after sale support.	-	
20	3.7	Contactable references for the same	X1 Contactable references for the	X2 Contactable references for the same	-	3 or more Contactable references for the	-	-	

	Technical Specification	Unique Identifier	
		Revision	0
		No of page	1 of 6
		Lethabo Power Station	

		instrument not supplied.	same instrument supplied	instrument supplied		same instrument supplied.		
--	--	--------------------------	--------------------------	---------------------	--	---------------------------	--	--

REQUIREMENT	SCORE (%)	REMARKS
Technical specification	Min 70%	Those marked with * are compulsory

Proposals will be required to meet an 70% functionality qualifying score plus all the compulsory aspects in order to be evaluated further and proposals that fail to achieve the minimum qualifying score for functionality will be disqualified.

FUNCTIONALITY: The review will be done by all relevant Supervisors.

	Technical Specification	Unique Identifier	
		Revision	0
		No of page	1 of 6
		Lethabo Power Station	

3. TECHNICAL ITEMS TO BE REQUESTED WITH TENDER (List of items)

List of returnable documents	Mandatory for Evaluation	Mandatory for points allocation	Mandatory for tender award
<p>Copy of valid intrinsically safe for use in hazardous environments certificate IP 66 / NEMA 4X compliance</p> <p>Only applicable to:</p> <ul style="list-style-type: none"> • Potable Relative air humidity analyzer • Potable Conductivity after cation removal and Degassed Conductivity after cation removal analyzer • Potable Hydrogen dew point analyser • Infrared thermometer 	Yes	Yes	Yes
Equipment Technical Data Sheet with technical specification	Yes	Yes	Yes
Original Equipment Manufacturer (OEM) certificate of accreditation to ISO 9001	Yes	Yes	Yes
Minimum of 3 x Contactable and Verifiable references with same instrument with comparable sample matrices	Yes	Yes	Yes
<p>Suppliers must provide after sales technical support (if supplier is not OEM, supply letter from OEM confirming after sales support which includes maintenance and calibration)</p> <p>If supplier is an OEM, provide Manufacture's declaration letter for the equipment or analyser</p>	Yes	Yes	Yes

	Technical Specification	Unique Identifier	
		Revision	0
		No of page	1 of 6
		Lethabo Power Station	

Supplier to provide face-to-face training upon delivery/installation of the equipment (letter from OEM confirming training will be provided upon delivery/installation or a letter confirming the supplier has been trained and found competent by the OEM to provide the training)	Yes	Yes	Yes
---	-----	-----	-----

Additional Required information:

Training Plan

- Scope and duration of training to be provided.
- Whether training is on-site or off-site.
- Training materials, manuals, and certifications (if any).

Installation, Operation, and Maintenance Manuals

- Full technical manuals to be supplied with the equipment.
- Installation instructions, calibration procedures, troubleshooting.