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South African National Accreditation System

CERTIFICATE OF ACCREDITATION

In terms of section 22(2) (b) of the Accreditation for Conformity Assessment, Calibration and Good Laboratory Practice Act, 2006 (Act 19 of 2006), read with sections 23(1), (2) and (3) of the said Act, I hereby certify that:-

X-LAB EARTH SCIENCE (PTY) LTD

Co. Reg. No.: 2007/007046/07

Facility Accreditation Number: **T0775**

is a South African National Accreditation System accredited facility provided that all conditions and requirements are complied with

This certificate is valid as per the scope as stated in the accompanying schedule of accreditation, Annexure "A", bearing the above accreditation number for

CHEMICAL ANALYSIS

The facility is accredited in accordance with the recognised International Standard

ISO/IEC 17025:2017

The accreditation demonstrates technical competency for a defined scope and the operation of a quality management system

While this certificate remains valid, the Accredited Facility named above is authorised to use the relevant accreditation symbol to issue facility reports and/or certificates

Mr M Phaloane
Acting Chief Executive Officer

Effective Date: 29 February 2024
Certificate Expires: 28 February 2029

ANNEXURE A

SCHEDULE OF ACCREDITATION

Facility Number: **T0775**

Permanent Address of Laboratory:

X-Lab Sciences
2 Samantha Street
Strydom Park
Randburg
2169

Technical Signatories:

Mrs T Tagari (All Methods)
Mr R Maleka (All Methods)
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Issue No.: 09
Date of Issue: 25 January 2024
Expiry Date: 28 February 2029

Material or Products Tested	Type of Tests / Properties Measured, Range of Measurement	Standard Specifications, Techniques / Equipment Used
CHEMICAL		
Water (Ground, surface drinking, waste, leachates, Total recoverable, as received and dissolved metals)	ICP-OES: Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Fe, K, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Se, Si, Sn, Sr, Ti, Tl, V, Zn, Cu	ME-AN-027 Based on USEPA 200.2 USEPA 200.7 APHA 3120
Solid type samples such as sediments, sludges and soils (with the exception of silica)	Recoverable Metals by Aqua Regia by ICP-OES: Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Se, Sn, Sr, Ti, Tl, V, Zn	ME-AN-027 Based on USEPA 200.2 USEPA 200 7.7 APHA3120
Filters	Recoverable Metals by Aqua Regia by ICP-OES: Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Se, Si, Sn, Sr, Ti, Tl, V, Zn	ME-AN-027 Based on NIOSH Methods 7301 2003 & 7082:1994 and US EPA 200.7:1994 APHA 3120
Water (Potable, ground, surface, industrial waste, leachates and industrial suitability)	Determination of pH @ 25°C	ME-AN-016 Based on APHA 4500-H+B
	Determination of Electrical Conductivity @ 25°C	ME-AN-007 Based on APHA 2510 B
	Determination of Solids – Total Suspended @ 105°C	ME-AN-009 Based on APHA 2540 D
	Determination of Solids – Total Dissolved @105°C	ME-AN-011 Based on APHA 2540 C

	Determination of Alkalinity – Total Carbonate, Bicarbonate and Hydroxide as $CaCO_3$ plus Carbonate and Hydroxide as Individual Species	ME-AN-001 Based on APHA 2320
	Determination of Hardness – Total, Calcium and Magnesium by calculation from ICP-OES Results	ME-AN-013 Based on APHA 2340 B
	Determination of Fluoride by ISE	ME-AN-021 Based on APHA 4500-FC
	Cation – Anion Balance by Calculation using results from ICP-OES, Alkalinity and Anion analysis	ME-AN-012 Based on 1030 E
Water (Potable, ground, surface , air filters, industrial waste, leachates and industrial suitability)	Anions – Fluoride, Chloride, Nitrite, Nitrate, and Sulphate	ME-AN-014 Based on APHA 4110B, NIOSH 7903, NIOSH 6013 and RADIELLO F1, Radiello J1, Radiello K1
Water (Potable, ground surface, industrial waste, leachates and industrial suitability)	Ammonia by Continuous Flow Analyser	ME-AN-032 Based on ISO 11732:2005 (E) & APHA 4500-NH3
	Total Cyanide by Continuous Flow Analyser	ME-AN-031 Based on ISO 14403:2002 (E) ASTM D6696-10
	Total Nitrogen by Continuous Flow Analyser	ME-AN-033 Based on ISO 29441:2010 (E) & APHA 4500-N
	Total Kjehldahl Nitrogen (Calculation from total Nitrogen by CFA & Nitrate/Nitrite by IC	ME-AN-037 Based on ISO 29441:2010 (E) & APHA 4110
	Free Cyanide by Continuous Flow Analyser	ME-AN-054-Based on ISO 14403:2002(E)
	WAD Cyanide by Continuous Flow Analyser	ME-AN-055 Based on ASTM D4374
Water (Potable, ground, surface, industrial waste and industrial suitability)	Volatile Organic Compounds by GC MS Purge & Trap (Including BTEX, THM,MTBE & TAME)	ME-AN-034 Based on :USEPA 5030C & USEPA 8260C
	Total Recoverable Petroleum Hydro-Carbons by GC FID (TPH/TRH including Bandings)	ME-AN-035 Based on USEPA 8015
	PAH by GC MS	ME-AN-036 Based on USEPA 8270
	Determination of Poly Chlorinated Biphenyls by GC MS	ME-AN-038 Based on USEPA 689 USEPA 3510C, USEPA 3550C
Solid type samples such as sediments, sludges and soil	Volatile Organic Compounds by GC MS Purge & Trap (including BTEX, THM,MTBE & TAME)	ME-AN-034 Based on USEPA 5035A & USEPA 8260C
	Total Recoverable Petroleum Hydro-carbons by GC FID (TPH/TRH including bandings)	ME-AN-035 Based on USEPA 8015

	PAH by GC MS	ME-AN-036 Based on USEPA 8270
	Determination of Poly Chlorinated Biphenyls by GC MS	ME-AN-038 Based on USEPA 689 USEPA 3510C, USEPA 3550C
Tailings, waste rock, sludge and soil	Modified Acid Base Accounting	ME-AN-025 Based on MEND Acid Rock Drainage Prediction Manual, MEND, 1991
	Determination of Paste pH	ME-AN-024 Based on MEND Acid Rock Drainage Prediction Manual,MEND, 1991
Solid, liquids and multiphase wastes	Toxicity Characterization Leachate Procedure	ME-AN-022 Based on USEPA TCLP 1311
Water (Solids Leachates)	Discrete Analyser:	
	Determination of Colour	ME-AN-039 Based on Standard Methods for the examination of water and waste water 18th edition, 1992 Methods 2120C Spectrophotometric Methods
	Determination of Ortho Phosphate	ME-AN-042 Based on USEPA 365.1
	Determination of Hexavalent Chromium	ME-AN-040 Based on APHA 71969,DIN EN ISO23913;2009, APHA 3500Cr-B
	Determination of Ammonia	ME-AN-041-Based on ISBN 011-7516139 & ISO-DIS 15923-1, Radiello I
	Determination of Total Phenols	ME-AN-052 Based on USEPA 420.1
	Determination of Sulphide	ME-AN-056 Based on APHA4500S^{2}-D, Radiello H
	Determination of Nitrite	ME-AN-048-Based on APHA 4500.NO_2-B
	Determination of Chloride	ME-AN-049-Based on APHA 4500.C1
	Determination of Sulphate	ME-AN-046-Based on USEPA 375-4
Stationary Emission Source/Air Emission	Determination of Sulphur Dioxide and Sulphuric Acid from Stationary sources	ME-AN-004 & ME-AN-017 Based on us EPA 6 & 8
	Determination of Dust Fallout by Gravimetric Analysis	ME-AN-062 Based on ASTM D 1739-98 (2017)
	Particulate Matter in Stationary Source by Gravimetric Analysis	ME-AN-059 Based on EN 13284-1, US EPA 5, USEPA 17
	Recoverable Metal by ICP-OES: Ag, As, Ba, Be, Cd, Cr, Co, Cu, Mg, Mn, Ni, P, Pb, Sb, Se, Tl, V, Zn, Hg by CV-AAS	ME-AN-057 Based on US EPA 29, EN 13211, EN 14385

	Hydrogen Halides and Halogens: Hydrogen, Bromide, Hydrogen Chloride, Hydrogen Fluoride, Chorine & Bromine	ME-AN-015 Based on US EPA 26, 26A, EN 1911 (chlorides only)
Volatile Organic Compounds	Volatile Organic Compounds by Thermal Desorption GC-MS (BTEX)	ME-AN-061 Based on US EPA Method TO 017 and NIOSH 2549-VOC, Radiello E1
Ammonia in Emission Sources	Ammonia by DA	ME-AN-063 Based on US EPA CTM 027, Radiello I
Water (Surface, Ground, Potable, Waste, Leachates) Total and dissolved solids- Sediments, Soils, Wastes	Mercury by CV-AAS	ME-AN-068 Based on US EPA 245.7 USEPA 200.2 APHA 3050B NIOSH 7301 EN 13211:2001

Original Date of Accreditation: 01 March 1999

ISSUED BY THE SOUTH AFRICAN NATIONAL ACCREDITATION SYSTEM

Accreditation Manager