SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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CHEMICAL

Valid To: January 31, 2028 Certificate Number: 6206.01

In recognition of the successful completion of the A2LA evaluation process accreditation is granted to this laboratory to perform the following chemical tests identified on the analytes noted below:

Soil:

Analyte(s)	Test Method(s)	Reference Method(s)
Acid Neutralizing Value for Liming Materials Calcium Carbonate Equivalent	TM SOIL 024-01	AOAC 955.01 Modified
Alcohols in Soil and Leachates by Capillary Gas Chromatograph Cyclohexanone Iso-Butanol Methanol n-Butanol Pyridine	TM GC 075-10	EPA 1311, SW-846 Extraction, EPA 8015D Modified
Analysis of BTEX/in Soil Samples Using SHS-GC/MSD + FID Benzene Ethylbenzene m/p-Xylene o-Xylene Toluene	TM ORG 001-10	SW 846, EPA 5021A/8260B Method A108.0-1/CCME-CWS-PHCS-TIER 1 Modified

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Analyte(s)	Test Method(s)	Reference Method(s)
Atterberg Limits of Soils Atterberg Limits	TM SOIL 050-10	ASTM D4318-Modified
Barium in Soil by ICP Barium Extractable Barium Fusion Barium Soluble	TM METAL 060-10	Alberta Environment/British Columbia Environmental Laboratory Manual/ASTM D4503/APHA 3120B Modified
Bulk Density and Specific Gravity of "As-Received" Samples Bulk Density	TM PREP 016-10	American Society of Agronomy No. 9, Part 1, Method 13-2 Modified
CaCO3 (Lime) Requirement in Soil by Sikora Buffer Lime Requirement - Soil	TM SOIL 060-10	Soil Sci. Soc. Am. J. 70: 474-486. Modified
Calcium Carbonate in Soil by Dual pH Calcium Carbonate	TM SOIL 133-10	J. Ashworth, COM. SOIL SCI PLANT SCI 28, 841-848, 1997 Modified
Cyanide in Aqueous Solutions by Continuous Flow Colorimetry Cyanide, SAD Cyanide, Total Cyanide, WAD Cyanide, Water Soluble	TM WET 053-10	NAQUADAT NO. 06608L/Method 335.3/APHA 4500-CN- I/ APHA 4500-CN-C Modified
Dean Stark Analysis in Soil and Sludge Oil Fraction Solids Fraction Water Fraction	TM OIL 027-10	ACOSA REF. METHOD Modified
EOX in Soil/Waste Extractable Organic Halogens	TM OIL 500-90	EPA 9023 Modified

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Analyte(s)	Test Method(s)	Reference Method(s)
Exchangeable Cations and Cation Exchange Capacity (CEC) In Soil by Ammonium Acetate Extraction Ammonium C.E.C. Calcium Magnesium Potassium Sodium	TM METAL 053-10	MSS Method 3.32/APHA 3120 B/ APHA 4500-NH3 G Modified
Extractable Ammonium and Nitrate in Soil by Continuous Flow Colorimetry Ammonium Nitrate	TM WET 016-10	MSS Method 4.35/APHA 4500-NH3 G/MSS Method 6.3 Modified
Extractable Macro Nutrients in Soil by ICP Calcium Magnesium Sodium	TM METAL 054-10	MSS Method 4.51/APHA 3120 B Modified
Extractable Micro Nutrients in Soil by ICP Copper Iron Manganese Zinc	TM METAL 073-10	MSS Method 4.65/APHA 3120B Modified
Extractable Nitrate, Phosphate and Potassium in Soils by Continuous Flow Colorimetry Nitrate Phosphorus Potassium	TM WET 018-10	SSMA Method 6.3/APHA 4500-P D/ Method 19103 565 Modified
Elemental Sulfur in Soil by ICP	TM METAL 084-10	In house method
Extractable Sulfur as Sulfate in Soils by ICP Sulfate	TM METAL 083-10	MSS Method 4.47/ APHA 3120B Modified
Flash Point in Liquid and Soil Samples by Penske-Martens Closed Cup Tester Flash Point	TM OIL 025-10	ASTM D93 Modified
Hot Water Soluble Boron in Soil by ICP Boron	TM METAL 059-10	MSS Method 4.61/APHA 3120B Modified

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Analyte(s)	Test Method(s)	Reference Method(s)
Leachable BTEX in Solids and Waste by GC/PID + FID with headspace analyzer Benzene Ethylbenzene m/p-xylene o-xylene Toluene	TM WET 033-10	SW-846, EPA1311, 5021A/8260B Modified
Metals in Soil, Sludge, Sediment and Oily Waste by ICP MS Antimony Arsenic Barium Beryllium Bismuth Boron Cadmium Chromium Cobalt Copper Iron Lead Lithium Mercury Molybdenum Nickel Selenium Silver Strontium Thallium Tin Titanium Uranium Vanadium Zinc Zirconium	TM METAL 077-10 TM METAL 081-10	BCMOE SALM/EPA Method 200.8/EPA 1311 TCLP/Special Waste Extraction Procedure Modified
Metals in Soil, Sludge, Sediment and Oily Waste by ICP OES Aluminum Calcium Iron Magnesium Manganese	TM METAL 077-10	BCMOE SALM Modified

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Analyte(s)	Test Method(s)	Reference Method(s)
Metals in Soil, Sludge, Sediment and Oily Waste by ICP OES (cont.) Phosphorous Potassium Silicon Sodium Sulfur	TM METAL 077-10	BCMOE SALM Modified
Organic Matter in Soil by Loss on Ignition	TM SOIL 019-10	MSS Method 3.8 Modified
Paint Filter Test Free Liquids - Waste	TM SOIL 130-10	SW846 EPA 9095B Modified
Particle Size Analysis by Wet Sieve	TM SOIL 121-10	ASTM C117 Modified
Particle Size Analysis of Soil by Dry Sieve	TM SOIL 032-10	MSS Method 55.4 Modified
Particle Size Analysis of Soil by Hydrometer	TM SOIL 120-10	MSS Method 55.3 Modified
pH and Electrical Conductivity in Soil/pH in Soil by 0.01M Calcium Chloride pH (0.01 M CaCl2) pH (1:2 Water/Soil)	TM SOIL 001-10 TM SOIL 021-10	MSS Method 4.11 & 4.12/3.11 Modified
pH and Electrical Conductivity in Soil: Water E.C. (1:2 water)	TM SOIL 001-10	MSS Method 4.11/4.12 Modified
Phenol in Aqueous Solutions by Continuous Flow Colorimetry Phenols, Total	TM WET 058-10	APHA 5530D Modified
Salinity, pH and EC of Field-Moist Soils Ammonium Calcium Chloride EC Extract Magnesium	TM SOIL 129-10	SSMA. 2008. pp. 161-168 Modified

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Analyte(s)	Test Method(s)	Reference Method(s)
Salinity, pH and EC of Field-Moist Soils (cont.) Nitrate + Nitrite pH Potassium Sodium Sulfur	TM SOIL 129-10	SSMA. 2008. pp. 161-168 Modified
Sodium Adsorption Ratio (SAR), pH and EC in Soil by Saturated Paste Ammonium Calcium Chloride EC Magnesium Nitrate + Nitrite pH Potassium Saturated Paste Extract Saturation Percentage Sodium Sulfur	TM SOIL 022-10	SSMA CH.15 Modified
Soil Moisture Content % Moisture	TM PREP 003-10	Martin R. Carter & E.G. Gregorich. Soil Sampling and Methods of Analysis, 2008. Method 4.4, Sample Moisture Content Modified
Volatile Organic Compounds in Solids and Leachate by Gas Chromatography / Mass Spectrometry (GC/MS): Capillary Column Technique 2-Butanone (MEK) 2-Nitropropane Acetone Benzene Carbon disulfide Ethyl Acetate Ethyl Benzene Ethyl Ether m&p-Cresol m&p-Xylene Methyl-2-Pentanone (MIBK) Nitrobenzene o-Cresol o-Xylene Toluene	TM GC 070-10	EPA 1311, SW-846 Extraction, EPA 8260B Modified, EPA 5021A Modified

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Water (Inorganic):

Analyte(s)	Test Method(s)	Reference Method(s)
Ammonia-N in Aqueous Solutions by Continuous Flow Colorimetry Ammonium	TM WET 008-10	APHA 4500 NH3-G/EPA 1311 Modified
Anions in Aqueous Solutions by Ion Chromatography Bromate Bromide Chlorate Chloride Chlorite Fluoride Iodide Nitrate Nitrite Phosphate Sulfate	TM WET 012-10	APHA 4110 B/EPA 1311/Special Waste Extraction Procedure Modified
Biological Oxygen Demand in Waters and Wastewaters by Incubation BOD CBOD	TM WET 044-10	APHA 5210B Modified
Chemical Oxygen Demand in Water and Wastewater by Block Digestion COD	TM WET 050-10	APHA 5220 D Modified
Chloride in Aqueous Solutions by Colorimetric Analysis Chloride	TM WET 100-10	APHA 4500Cl E Modified
Cyanide in Aqueous Solutions by Continuous Flow Colorimetry Cyanide - Dissolved Cyanide - SAD Cyanide - Total Cyanide - WAD	TM WET 053-10	NAQUADAT 06608L/EPA 335.3/APHA 4500-CN C/APHA 4500-CN-I/EPA 1311/Special Waste Extraction Procedure Modified
Dissolved Oxygen in Water and Wastewater by Titration COD	TM WET 022-10	APHA 4500-O C, Modified

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Analyte(s)	Test Method(s)	Reference Method(s)
Dissolved Solids Fixed Dissolved Solids Total Dissolved Solids Volatile Dissolved Solids	TM WET 055-10	APHA 2540C/APHA 2540 E Modified
Filterable Residue in Oilfield Water, Gravimetric Dissolved Solids - Ignited at 550 °C Dissolved Solids - Dried at 110 °C	TM WQ 035b-90	APHA 2540 C/APHA 2540 E Modified
Hexavalent Chromium in Aqueous Solutions by Colorimetric Discrete Analyzer Chromium (Hexavalent)	TM WET 075-10	APHA 3500CR B/EPA 1311 Modified
Measurement of pH in Water and Wastewater at 15°C pH	TM WET 104-10	APHA, 4500H+ B, Modified
Mercury in Aqueous Solutions by Cold Vapour Atomic Fluorescence Mercury - Dissolved Mercury - Extractable Mercury - Total	TM METAL 063-10	EPA Method 245.5 /APHA 3112B Modified
Metals in Aqueous Solutions by ICP-OES Total Calcium Total Iron Total Magnesium Total Manganese Total Phosphorus Total Potassium Total Silicon Total Sodium Total Sulfur	TM METAL 080-10	British Columbia Environmental Lab Manual (2009) - Digestion for Total Metals in Water - Prescriptive/EPA 200.8/APHA 3125B Modified
Metals in Aqueous Solutions by ICP-OES Dissolved Barium (High) Dissolved Calcium Dissolved Iron (High) Dissolved Magnesium Dissolved Manganese (High) Dissolved Phosphorus Dissolved Potassium Dissolved Silicon Dissolved Sodium	TM METAL 080-10	APHA 3120B/APHA 3030 F Modified

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Analyte(s)	Test Method(s)	Reference Method(s)
Metals in Aqueous Solutions by ICP-OES (cont.) Dissolved Sulfur Hardness - Calculation Sodium Absorption Ratio – Calculation Extractable Calcium Extractable Iron Extractable Magnesium Extractable Manganese Extractable Phosphorus Extractable Potassium Extractable Silicon Extractable Sodium Extractable Sulfur	TM METAL 080-10	APHA 3120B/APHA 3030 F Modified
Molybdate Reactive Silica in Water by Spectrophotometer Reactive Silica	TM WET 091-10	APHA 4500 SIO2 F Modified
Orthophosphate in Water by Colorimetric Discrete Analyzer /Total and Dissolved Phosphorus in Water by Smartchem Colorimetric Discrete Analyzer Orthophosphate (SRP) Total Dissolved Phosphorus Total Phosphorus	TM WET 073-10 TM WET 099-10	APHA 4500 P-F/APHA, 4500-P B/APHA, 4500-P F Modified
pH, Electrical Conductivity and Total and Phenolphthalein Alkalinity in Water by PCTitrate Auto Titrator Alkalinity (pH 4.5) Electrical Conductivity pH	TM WET 001-10	APHA 2320 B/APHA, 2510 B/ APHA 4500H+ B Modified
Phenol in Aqueous Solutions by Continuous Flow Colorimetry Phenols	TM WET 058-10	APHA 5530 D/EPA 1311 Modified

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Analyte(s)	Test Method(s)	Reference Method(s)
TOC, DOC, TIC, DIC, and TC in Water and Wastewater by High-Temperature Combustion Carbon-Dissolved Inorganic Carbon-Dissolved Nonpurgeable Organic Carbon-Total Carbon-Total Inorganic Carbon-Total Nonpurgeable Organic	TM WET 020-10	APHA 5310B
Total and Free Chlorine in Water by Spectrophotometer Free Chlorine Total Chlorine	TM WET 068-10	APHA 4500CL G Modified
Total Nitrogen in Water and Wastewater by High-Temperature Combustion Dissolved Kjeldahl Nitrogen Dissolved Nitrogen Total Kjeldahl Nitrogen Total Nitrogen	TM WET 040-10	ISO/TR 11905:1997(E) Modified
Total Oil & Grease in Water by Gravimetric Analysis Total Oil and Grease	TM OIL 065-10	EPA 1664 Modified
Total Sulfide in Aqueous Solutions by Automated Gas Dialysis Sulfide	TM WET 057-10	APHA 4500 S2-E Modified
Total Suspended Solids in Water and Wastewater Dried at 104° C Fixed Suspended Solids Total Suspended Solids Volatile Suspended Solids	TM WET 056-10	APHA 2540 D/APHA 2540 E Modified
Trace Metals in Aqueous Solutions by ICP-MS Total Aluminum Total Antimony Total Arsenic Total Barium Total Beryllium Total Bismuth Total Boron Total Cadmium Total Chromium	TM METAL 081-10	British Columbia Environmental Lab Manual (2009) - Digestion for Total Metals in Water - Prescriptive/EPA 200.8/APHA 3125B Modified

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Analyte(s)	Test Method(s)	Reference Method(s)
Trace Metals in Aqueous Solutions by ICP-MS (cont.) Dissolved Aluminum Dissolved Antimony Dissolved Arsenic Dissolved Barium Dissolved Beryllium Dissolved Bismuth Dissolved Boron Dissolved Cadmium Dissolved Chromium Dissolved Cobalt Dissolved Copper Dissolved Iron Dissolved Lead Dissolved Lithium Dissolved Molybdenum Dissolved Nickel Dissolved Selenium Dissolved Silver Dissolved Strontium Dissolved Thallium Dissolved Tin Dissolved Titanium Dissolved Uranium Dissolved Vanadium Dissolved Zinc Dissolved Zirconium Extractable Aluminum Extractable Antimony Extractable Arsenic Extractable Barium Extractable Beryllium Extractable Boron Extractable Cadmium Extractable Chromium Extractable Cobalt Extractable Copper Extractable Iron Extractable Lead Extractable Lithium Extractable Molybdenum Extractable Nickel Extractable Selenium Extractable Silver Extractable Strontium Extractable Thallium Extractable Tin	TM METAL 081-10	British Columbia Environmental Lab Manual (2009) - Digestion for Total Metals in Water - Prescriptive/EPA 200.8/APHA 3125B Modified

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Trace Metals in Aqueous Solutions by ICP-MS (cont.) Extractable Titanium Extractable Uranium Extractable Vanadium Extractable Zinc Extractable Zirconium Total Cobalt Total Copper Total Iron Total Lead Total Lithium Total Manganese Total Molybdenum Total Nickle Total Selenium Total Silver Total Strontium Total Thalium Total Thorium Total Tin Total Titanium Total Uranium Total Vanadium Total Zinc Total Zirconium	TM METAL 081-10	British Columbia Environmental Lab Manual (2009) - Digestion for Total Metals in Water - Prescriptive/EPA 200.8/APHA 3125B Modified
Trace Metals in Aqueous Solutions by ICP-OES	TM METAL 081-10	EPA 200.8/APHA 3125B Modified
True and Apparent Color in Water by Visual Comparison Color	TM WET 025-10	APHA 2120B Modified
Turbidity in Water and Wastewater by Nephelometric Method Turbidity	TM WET 064-10	APHA 2130B Modified
UV Absorbance and Transmittance in Water and Waste Water by Spectrophotometer UV Absorbance and Transmittance	TM WET 035-10	APHA 5910B Modified

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Water (Organic):

Analyte(s)	Test Method(s)	Reference Method(s)
Microtox 15 Minute, Multiple Concentration, Acute, Static EC50 Bioassay	TM Bio 037-10	EPS 1/RM/24 Modified Microtox EC 50 (15 min)

Petroleum Crudes and Natural Gas:

Analyte(s)	Test Method(s)	Reference Method(s)
Absolute and Relative Density and API Gravity: Digital Density Meter	TM OIL 050-90	ASTM D4052 Density, Relative Density, Modified/ASTM D5002 Modified
Acid Number by Catalytic Thermometric Titration	TM OIL 245-90	ASTM D8045
Acid Number by Potentiometric Titration	TM OIL 241-90	ASTM D664 Modified
Asphaltenes Content of Crude Oil, Condensate and Bitumen Asphaltene	TM OIL 200-90	Syncrude Method 5.1 Modified
Carbon Residue: Microcarbon Method Micro Carbon Residue	TM OIL 135-90	ASTM D4530
Compositional Gas Analysis Natural gas: N2, CO2, C1-C10+, He, H2, H2S Density, Gross Heating Value, Pseudocritical Pressure and Temperature, Relative Molecular Mass (Total and C7+) and Vapour Pressure (C5+)	TM GAS 023-90	GPA 2286 Modified GPA 2261 Modified
D86 Atmospheric Distillation	TM OIL 150-90	ASTM D86 Modified
Dynamic Viscosity and Density of Liquids by Stabinger Viscometer Absolute Viscosity Density Kinematic Viscosity	TM OIL 145-90	ASTM D7042 Modified
Extended Gas Analysis GPA 2286: N2, CO2, C1-C15+, He, H2	TM GAS 028-90	GPA 2286 Modified
Flash and Fire Points by Cleveland Open Cup Tester Flash Point	TM OIL 170-90	ASTM D92 Modified

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Analyte(s)	Test Method(s)	Reference Method(s)
Flash Point of Petroleum Oils and Lubricants Flash Point - Closed Cup	TM OIL 171-90	ASTM D93 Modified
High Pressure Liquid Compositional Analysis N2, CO2, H2S, C1-C30+, Benzene, Toluene, Ethylbenzene & p+m Xylene, o-Xylene, 1,2,4 Trimethylbenzene, Cyclopentane, Methylcyclopentane, Cyclohexane, Methylcyclohexane, Density, Relative Molecular Mass and Gas Equivalent Factor	TM GAS 015-90	In-House Method
Hydrogen Sulfide and Mercaptan Sulfur in Liquid Hydrocarbon: by Potentiometric Titration Hydrogen Sulfide Mercaptan as Sulfur	TM GAS 025-90	UOP 163 Modified
Light Ends Characterization by Direct Injection N2, CO2, C1 – C4, iC4, nC4	TM GAS 273-90	GPA 2177 Modified
Low Pressure Liquid Composition Analysis H2S, C1-C30+, Benzene, Toluene, Ethylbenzene & p+m Xylene, o-Xylene, 1,2,4 Trimethylbenzene, Cyclopentane, Methylcyclopentane, Cyclohexane, Methylcyclohexane, Density, Relative Molecular Mass and Gas Equivalent Factor	TM GAS 016-90	ASTM D2887 Modified
Metals and Organic Phosphorus in Light Crude Oil by ICP Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron	TM OC 100-90	ASTM D5708A Modified Canadian Association of Petroleum Producers: Test Method for Determination of Organo-Phosphorus in Volatile Distillates of Crude Oil by ICP-OES, Oct 6, 2006 Modified

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Analyte(s)	Test Method(s)	Reference Method(s)
Lead Magnesium Manganese Molybdenum Nickel Phosphorus Organo - Phosphorus Potassium Selenium Silver Sodium Strontium Tin Titanium Vanadium Zinc Zirconium		
NGL Analysis by Gas Chromatography N2, CO2, H2S, C1-C12+, Density, Relative Molecular Mass and Gas Equivalent Factor	TM GAS 009-90	ASTM D2163 Modified
Organic Chloride Content of Crude and Waste Oil Organic Chloride	TM OIL 076-90	ASTM D4929 B Modified
Salt Content in Oil	TM OIL 070-90	In-House Method
Sediment and Water (BS&W) in Crude and Heavy Oil: Centrifuge Method	TM OIL 040-90	ASTM D4007 Modified
Sediment in Crude Oil by Membrane Filtration	TM OIL 242-90	ASTM D4807 Modified CCQTA Test Method for Filterable Solids Measurement in Condensate Procedure C
Total Reduced Sulfur Analysis of Natural Gas: Gas Chromatography/Sulfur Chemiluminescence Detector. Hydrogen sulfide, Carbonyl Sulfide, MethylMercaptan, EthylMercaptan, DimethylSulfide, Carbon Disulfide, i-PropylMercaptan, t-ButylMercaptan, n-PropylMercaptan, MethylEthylSulfide,	TM GAS 014a-90	ASTM D5504

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Analyte(s)	Test Method(s)	Reference Method(s)
s-ButylMercaptan, i-ButylMercaptan, Diethylsulfide, n-ButylMercaptan, Dimethyl disulfide		
Total Sulfur: X-Ray Fluorescence Method	TM OIL 060-90	ASTM D4294 Modified
Vapour Pressure - Automated VPCR - ASTM D 6377 TVP – ASTM D5191	TM OIL 125-90	ASTM D6377 Modified ASTM D5191 Modified
Water Content by Karl Fischer Coulometric Titration	TM OIL 160-90	ASTM D4928 ASTM D6304

Notes:

AOAC: Association of Official Analytical Collaboration
ASTM: American Society for Testing and Materials
APHA: American Public Health Association (Standard Methods for the Examination of Water & Wastewater)
BCMOE: British Columbia Ministry of Environment
CCME-CWS-PHCS Tier 1: Canadian Council of Ministers of the Environment, Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1
EPA: Environmental Protection Agency
GPA: Gas Processors Association
MSS: Manual on Soil Sampling and Methods of Analysis - J.A. McKeague, 1978
SSMA: Soil Sampling and Methods of Analysis, Martin R. Carter, 2008

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Accredited Laboratory

A2LA has accredited

ELEMENT MATERIALS TECHNOLOGY CANADA INC.

Edmonton, Alberta, CANADA

for technical competence in the field of

Chemical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 3rd day of November 2025.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 6206.01
Valid to January 31, 2028

For the tests to which this accreditation applies, please refer to the laboratory's Chemical Scope of Accreditation.

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