



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

ELEMENT MATERIALS TECHNOLOGY CANADA INC.
2712-37 Ave NE Calgary
Alberta Canada T1Y 5L3
Ha Du Phone: 403-291-2022
Email: ha.du@element.com

CHEMICAL

Valid To: January 31, 2022

Certificate Number: 6206.02

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 noted analytes below:

Oil

<u>Analyte</u>	<u>Test Method</u>	<u>Reference Method(s)</u>
Analysis of Polychlorinated Biphenyls (PCBs) by GC/ECD Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242 Aroclor 1248 Aroclor 1254 Aroclor 1260 Aroclor 1262 Aroclor 1268 Total PCB	TM PCB 004-50	EPA 3580 Mod EPA 8082 Mod

<u>Analyte</u>	<u>Test Method</u>	<u>Reference Method(s)</u>
Acid Herbicides by HPLC/MSD Bromoxynil Clopyralid Dicamba 2,4-Dichlorophenoxyacetic acid (2,4-D) 2,4-Dichlorophenoxybutyric acid (2,4-DB) Dichloroprop Dinoseb Imazapyr MCPA MCPB	TM PEST 006-50	EPA 555/8321 Mod

Analyte	Test Method	Reference Method(s)
Acid Herbicides by HPLC/MSD (cont) Mecoprop (MCP) Picloram 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T) 2,4,5-Trichlorophenoxypropionic acid (2,4,5-TP)	TM PEST 006-50	EPA 555/8321 Mod
Alcohols by Capillary Gas Chromatograph 1-Butanol 2-Butanol Ethanol 2-Methyl-1-Propanol (Isobutanol) 2-Methyl-2-Propanol (tert-Butyl alcohol) 1-Pentanol 1-Propanol (Propanol) 2-Propanol (Isopropanol)	TM ALC 001-50	EPA 8015 Mod
Analysis of C6-C16 Compounds, VH/VPH, F1, and F2 by Headspace GC/MS/FID Benzene Ethylbenzene F1: C6-C10 Hexane Methyl tert-butyl ether (MTBE) Styrene Toluene Volatile Petroleum Hydrocarbons (VPH) m/p-Xylene o-Xylene	TM BTX 005-50	EPA 5021/8260/CCME-CWS-PHCS- TIER 1 Mod
Analysis of Chlorinated Phenolics by In Situ Acetylation and GC/MS 2-Chlorophenol 3-Chlorophenol 4-Chloro-3-methylphenol 4-Chlorophenol 2,3-Dichlorophenol 2,4 & 2,5-Dichlorophenol 2,6-Dichlorophenol 3,4-Dichlorophenol 3,5-Dichlorophenol Pentachlorophenol 2,3,4,5-Tetrachlorophenol 2,3,4,6-Tetrachlorophenol	TM PCP 003-50	EPA 3650/1653/3510/8041 Mod

<u>Analyte</u>	<u>Test Method</u>	<u>Reference Method(s)</u>
Analysis of Chlorinated Phenolics by In Situ Acetylation and GC/MS (cont) 2,3,5,6-Tetrachlorophenol 2,3,4-Trichlorophenol 2,3,5-Trichlorophenol 2,3,6-Trichlorophenol 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol 3,4,5-Trichlorophenol	TM PCP 003-50	EPA 3650/1653/3510/8041 Mod
Analysis of Polychlorinated Biphenyls (PCBs) by GC/ECD Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242 Aroclor 1248 Aroclor 1254 Aroclor 1260 Aroclor 1262 Aroclor 1268 Total PCB	TM PCB 004-50	EPA 3540/8082 Mod
Analysis of Polynuclear Aromatic Hydrocarbons (PAHs) by GC/MS Acenaphthene Acenaphthylene Acridine Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(g,h,i)perylene Benzo(j)fluoranthene Benzo(k)fluoranthene Chrysene Dibenzo(a,h)anthracene Fluoranthene Fluorene Indeno(1,2,3-c,d)pyrene 1-Methylnaphthalene 2-Methylnaphthalene Naphthalene Phenanthrene Pyrene Quinoline	TM PAH 004-50	EPA 3540/8270 Mod

<u>Analyte</u>	<u>Test Method</u>	<u>Reference Method</u>
Carbamates by HPLC/MSD Aldicarb Bendiocarb Carbaryl Carbofuran Propoxur (Baygon)	TM PEST 007-50	EPA 8318 Mod
Extractable Hydrocarbons in Water and CCME/BCMELP Hydrocarbons in Soil (Benchmark and Alternative Method) by GC/FID F2: C10-C16 F3: C16-C34 F4: C34-C50 F4HTGC: C34+ Hydrocarbons (or >C34) Extractable Petroleum Hydrocarbons (EPH) C10-C19 Extractable Petroleum Hydrocarbons (EPH) C19-C32 Light Extractable Petroleum Hydrocarbons (LEPH) Heavy Extractable Petroleum Hydrocarbons (HEPH) SASK C11-C22 SASK C23-C60 SASK Total (C11-C60) TEH (C11-C40+)	TM CCME 004-50 Alt. Method	CCME-CWS-PHCS-TIER 1 Mod
Glycol Analysis by HPLC/MSD Diethylene glycol Ethylene glycol Propylene glycol Tetraethylene glycol Triethylene glycol	TM GLY 001-50	EPA 8321 Mod
Pesticides by GC/MSD Alachlor Butylate Chloroprotham Dicofop-methyl EPTC (Eptam) Hexazinone Metolachlor Metribuzin Prometon Prometryn Pronamide (Propyzamide) Propazine Triallate Trifluralin	TM PEST 012-50	EPA 8081 Mod

<u>Analyte</u>	<u>Test Method</u>	<u>Reference Method</u>
Pesticides by GC/MSD (cont) Aldrin alpha-BHC beta-BHC gamma-BHC (Lindane) alpha-Chlordane gamma-Chlordane Chlorothalonil 2,4'-DDD 4,4'-DDD 2,4'-DDE 4,4'-DDE 2,4'-DDT 4,4'-DDT Dieldrin Endosulfan I Endosulfan II Endosulfan sulfate Endrin Heptachlor Heptachlor epoxide Methoxychlor Mirex cis-Permethrin trans-Permethrin Propachlor	TM PEST 012-50	EPA 8081 Mod
Pesticides by GC/MSD Azinphos-methyl Chlorpyrifos Diazinon Dimethoate Malathion Parathion Phorate Terbufos	TM PEST 012-50	EPA 8141 Mod
Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method F2: C10-C16 F3: C16-C34 F4: C34-C50 F4G: Gravimetric Heavy Hydrocarbons F4HTGC: C34+ Hydrocarbons (or >C34)	TM CCME 004-50	CCME-CWS-PHCS-TIER 1

<u>Analyte</u>	<u>Test Method</u>	<u>Reference Method</u>
Sterilant Scan by HPLC/MSD Atrazine Bromacil Cyanazine Desethylatrazine Desisopropylatrazine Didesalkylatrazine Diuron Linuron Metoxuron Simazine Tebuthiuron	TM PEST 004-50	AENV A119.0 Mod
Sulfolane, Diisopropanolamine, and Other Alkanoamines by HPLC/MSD Diethanolamine Diisopropanolamine Ethanolamine Methyldiethanolamine Sulfolane Triethanolamine	TM SULF 001-50	EPA 8321 Mod

Waste

<u>Analyte</u>	<u>Test Method</u>	<u>Reference Method</u>
Analysis of C6-C16 Compounds, VH/VPH, F1, and F2 by Headspace GC/MSD/FID Leachable Benzene Leachable Ethylbenzene Leachable Toluene Leachable Xylenes	TM BTX 005-50 WI TCLP 002-50	EPA 1311/8260 Mod

<u>Analyte</u>	<u>Test Method</u>	<u>Reference Method</u>
Volatile Organic Compounds by GC/MS: Capillary Column Technique Acetone (2-Propanone) Acetonitrile Acrylonitrile Allyl chloride Benzene Bromobenzene Bromochloromethane Bromodichloromethane Bromoform Bromomethane 2-Butanone (MEK) n-Butylbenzene sec-Butylbenzene tert-Butylbenzene Carbon disulfide Carbon tetrachloride Chlorobenzene Chlorodibromomethane Chloroethane 2-Chloroethyl vinyl ether Chloroform (Trichloromethane) Chloromethane 2-Chlorotoluene 4-Chlorotoluene 1,2-Dibromo-3-chloropropane Dibromochloromethane 1,2-Dibromoethane (Ethylene dibromide) Dibromomethane cis-1,4-Dichloro-2-butene trans-1,4-Dichloro-2-butene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Dichlorodifluoromethane 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethene (1,1-Dichloroethylene) cis-1,2-Dichloroethene (cis-1,2-Dichloroethylene) trans-1,2-Dichloroethene (trans-1,2-Dichloroethylene) Dichloromethane (Methylene chloride) 1,2-Dichloropropane 1,3-Dichloropropane 2,2-Dichloropropane 1,1-Dichloropropene cis-1,3-Dichloropropene trans-1,3-Dichloropropene Ethyl methacrylate	TM VOC 003-50	EPA 5035/8260 Mod



<u>Analyte</u>	<u>Test Method</u>	<u>Reference Method</u>
Volatile Organic Compounds by GC/MS: Capillary Column Technique (cont.) Ethylbenzene Hexachlorobutadiene Hexachloroethane 2-Hexanone Iodomethane Isopropylbenzene p-Isopropyltoluene Methacrylonitrile Methyl methacrylate Methyl tertiary-butyl ether (MTBE) 4-Methyl-2-pentanone (MIBK) Naphthalene Pentachloroethane Propionitrile n-Propylbenzene Styrene 1,1,1,2-Tetrachloroethane 1,1,2,2-Tetrachloroethane Tetrachloroethene (Tetrachloroethylene) Toluene 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene 1,1,1-Trichloroethane Trichlorofluoromethane Trichloroethene (Trichloroethylene) 1,1,2-Trichloroethane 1,2,3-Trichloropropane 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Vinyl chloride m/p-Xylene o-Xylene	TM VOC 003-50	EPA 5035/8260 Mod

Water

<u>Analyte</u>	<u>Test Method</u>	<u>Reference Method</u>
Acid Herbicides by HPLC/MSD Bromoxynil Clopyralid Dicamba 2,4-Dichlorophenoxyacetic acid (2,4-D) 2,4-Dichlorophenoxybutyric acid (2,4-DB) Dichloroprop Dinoseb	TM PEST 006-50	EPA 555/8321 Mod

<u>Analyte</u>	<u>Test Method</u>	<u>Reference Method</u>
Acid Herbicides by HPLC/MSD (cont.) Imazapyr MCPA MCPB Mecoprop (MCPB) Picloram 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T) 2,4,5-Trichlorophenoxypropionic acid (2,4,5-TP)	TM PEST 006-50	EPA 555/8321 Mod
Acid-Extractable Organics (Naphthenic Acids) in Water by FTIR Naphthenic Acid	TM NAS 001-50	Scott et al. Chemosphere 73 (2008) 1258-1264/doi:10.1016/j.scitotenv.2010.08.013 Mod
Alcohols by Capillary Gas Chromatograph 1-Butanol 2-Butanol Ethanol Methanol 2-Methyl-1-propanol (Isobutanol) 2-Methyl-2-propanol (tert-Butyl alcohol) 1-Pentanol (Pentanol) 1-Propanol (Propanol) 2-Propanol (Isopropanol)	TM ALC 001-50	EPA 8015 Mod
Analysis of C6-C16 Compounds, VH/VP, F1, and F2 by Headspace GC/MS/FID Benzene Ethylbenzene F1: C6-C10 F2: C10-C16 Hexane Methyl t-butyl ether (MTBE) Styrene Toluene Volatile Petroleum Hydrocarbons m/p-Xylene o-Xylene	TM BTX 005-50	EPA 5021/8260 Mod

Analyte	Test Method	Reference Method
Analysis of Chlorinated Phenolics by In Situ Acetylation and GC/MS 2-Chlorophenol 3-Chlorophenol 4-Chloro-3-methylphenol 4-Chlorophenol 2,3-Dichlorophenol 2,4 & 2,5-Dichlorophenol 2,6-Dichlorophenol 3,4-Dichlorophenol 3,5-Dichlorophenol Pentachlorophenol 2,3,4,5-Tetrachlorophenol 2,3,4,6-Tetrachlorophenol 2,3,5,6-Tetrachlorophenol 2,3,4-Trichlorophenol 2,3,5-Trichlorophenol 2,3,6-Trichlorophenol 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol 3,4,5-Trichlorophenol	TM PCP 003-50	EPA 1653/8041 Mod
Analysis of Polychlorinated Biphenyls (PCBs) by GC/ECD Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242 Aroclor 1248 Aroclor 1254 Aroclor 1260 Aroclor 1262 Aroclor 1268 Total PCB	TM PCB 004-50	EPA 3150/8082 Mod
Analysis of Polynuclear Aromatic Hydrocarbons (PAHs) by GC/MS Acenaphthene Acenaphthylene Acridine Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(g,h,i)perylene Benzo(j)fluoranthene Benzo(k)fluoranthene Chrysene Dibenzo(a,h)anthracene Fluoranthene Fluorene	TM PAH 004-50	EPA 3510/8270 Mod

<u>Analyte</u>	<u>Test Method</u>	<u>Reference Method</u>
Analysis of Polynuclear Aromatic Hydrocarbons (PAHs) by GC/MS (cont.) Indeno(1,2,3-c,d)pyrene 1-Methylnaphthalene 2-Methylnaphthalene Naphthalene Phenanthrene Pyrene Quinoline	TM PAH 004-50	EPA 3510/8270 Mod
Carbamates by HPLC/MSD Aldicarb Bendiocarb Carbaryl Carbofuran Propoxur (Baygon)	TM PEST 007-50	EPA 8318 Mod
Determination of Haloacetic Acids in Water by Liquid-Liquid Micro Extraction, Methylation, and GC/ECD Monobromoacetic acid (MBAA) Monochloroacetic acid (MCAA) Bromochloroacetic acid (BCAA) Dibromoacetic acid (DBAA) Dichloroacetic acid (DCAA) Trichloroacetic acid (TCAA)	TM HAA 001-50	EPA 552.3



<u>Analyte</u>	<u>Test Method</u>	<u>Reference Method</u>
Extractable Hydrocarbons in Water and CCME/BCMOE Hydrocarbons in Soil (Benchmark and Alternative Method) by GC/FID F2: C10-C16 F3: C16-C34 F3+: C34+ F4: C34-C50 Extractable Petroleum Hydrocarbons (EPH) C10-C19 Extractable Petroleum Hydrocarbons (EPH) C19-C32 Light Extractable Petroleum Hydrocarbons (LEPH) Heavy Extractable Petroleum Hydrocarbons (HEPH)	TM CCME 004-50	EPA 3510/CCME-CWS-PHCS-TIER 1 Mod
Glycol Analysis by HPLC/MSD Diethylene glycol Ethylene glycol Propylene glycol Tetraethylene glycol Triethylene glycol	TM GLY 001-50	EPA 8321 Mod
Glyphosates by HPLC/MSD Glyphosate	TM PEST 011-50	EPA 8321 Mod
Microcystins Analysis by ELISA Method	TM ELI 001-50	Envriologix Quantiplate Kit for Microcystins



<u>Analyte</u>	<u>Test Method</u>	<u>Reference Method</u>
Pesticides by GC/MSD Alachlor Butylate Chloroprotham Diclofop-methyl EPTC Hexazinone Metolachlor Metribuzin Prometon Prometryn Pronamide (Propyzamide) Propazine Triallate Trifluralin Aldrin alpha-BHC beta-BHC delta-BHC gamma-BHC (Lindane) alpha-Chlordane gamma-Chlordane Chlorothalonil 2,4'-DDD 4,4'-DDD 2,4'-DDE 4,4'-DDE 2,4'-DDT 4,4'-DDT Dieldrin Endosulfan I Endosulfan II Endosulfan sulfate Endrin Heptachlor 16 ASB_JA_LAP-Scope- Template_v2_2020-05-14 Heptachlor epoxide Methoxychlor Mirex cis-Permethrin trans-Permethrin Propachlor	TM PEST 012-50	EPA 8081 Mod



<u>Analyte</u>	<u>Test Method</u>	<u>Reference Method</u>
Pesticides by GC/MSD Azinphos-methyl Chlorpyrifos Diazinon Dimethoate Malathion Parathion Phorate Terbufos	TM PEST 012-50	EPA 8141 Mod
Sterilant Scan by HPLC/MSD Atrazine Bromacil Cyanazine Desethylatrazine Desisopropylatrazine Didesalkylatrazine Diuron Linuron Metoxuron Simazine Tebuthiuron	TM PEST 004-50	AENV A119.0 Mod
Sulfolane, Diisopropanolamine, and Other Alkanoamines by HPLC/MSD Diethanolamine Diisopropanolamine Ethanolamine Methyldiethanolamine Sulfolane Triethanolamine	TM SULF 001-50	EPA 8321 Mod



<u>Analyte</u>	<u>Test Method</u>	<u>Reference Method</u>
Volatile Organic Compounds by GC/MS Capillary Column Technique Acetone (2-Propanone) Acetonitrile Acrylonitrile Allyl chloride Benzene Bromobenzene Bromochloromethane Bromodichloromethane Bromoform Bromomethane 2-Butanone (MEK) n-Butylbenzene sec-Butylbenzene tert-Butylbenzene Carbon disulfide Carbon tetrachloride Chlorobenzene Chlorodibromomethane Chloroethane 2-Chloroethyl vinyl ether Chloroform (Trichloromethane) 19 ASB_JA_LAP-Scope- Template_v2_2020-05-14 Chloromethane 2-Chlorotoluene 4-Chlorotoluene 1,2-Dibromo-3-chloropropane Dibromochloromethane 1,2-Dibromoethane (Ethylene dibromide) Dibromomethane cis-1,4-Dichloro-2-butene trans-1,4-Dichloro-2-butene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Dichlorodifluoromethane 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethene (1,1-Dichloroethylene) cis-1,2-Dichloroethene (cis-1,2- Dichloroethylene) Dichloromethane (Methylene chloride) 1,2-Dichloropropane 1,3-Dichloropropane 2,2-Dichloropropane 1,1-Dichloropropene	TM VOC 003-50	EPA 5030/8260 Mod

<u>Analyte</u>	<u>Test Method</u>	<u>Reference Method</u>
Volatile Organic Compounds by GC/MS Capillary Column Technique (cont.) cis-1,3-Dichloropropene trans-1,3-Dichloropropene Ethyl methacrylate Ethylbenzene Hexachlorobutadiene Hexachloroethane 2-Hexanone Iodomethane Isopropyl benzene p-Isopropyltoluene Methacrylonitrile Methyl Methacrylate Methyl tertiary-butyl ether (MTBE) 4-Methyl-2-pentanone (MIBK) Naphthalene Pentachloroethane Propionitrile n-Propylbenzene Styrene 1,1,1,2-Tetrachloroethane 1,1,2,2-Tetrachloroethane Tetrachloroethene (Tetrachloroethylene) Toluene 1,2,3-Trichlorobenzene 20 ASB_JA_LAP-Scope- Template_v2_2020-05-14 1,2,4-Trichlorobenzene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene (Trichloroethylene) Trichlorofluoromethane 1,2,3-Trichloropropane 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Vinyl chloride m/p-Xylene o-Xylene	TM VOC 003-50	EPA 5030/8260 Mod

Food

<u>Test</u>	<u>Test Method(s)</u>	<u>Reference Method(s)</u>
Ash in Food	TM FOOD 001-50	AOAC 923.03 Mod
Bone Particle Size of Meat Samples	TM FOOD 002-50	CFIA FLS-1971-001 Mod
Moisture	TM FOOD 003-50	AOAC 950.46 Mod
Total Fat	TM FOOD 005-50	AOCS Am 5-04 Mod

Key: **AENV:** Alberta Environment
AOAC: Association of Official Analytical Collaboration
AOCS: American Oil Chemist Society
APHA: American Public Health Association (Standard Methods for the Examination of Water and Wastewater)
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
CFIA FLS: Canadian Food Inspection Agency – Food Laboratory Services
EPA: Environmental Protection Agency
JAOAC: Journal of the Association of Official Analytical Chemists





Accredited Laboratory

A2LA has accredited

ELEMENT MATERIALS TECHNOLOGY CANADA INC.

Calgary, 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 18th day of January 2021.

A blue ink signature of the Vice President of Accreditation Services, written over a horizontal line.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 6206.02
Valid to January 31, 2022

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