



NORTH COAL LIMITED
ATTN: Bill Arling
652 F Sparwood Drive
PO Box 576
Sparwood BC V0B 2G0

Date Received: 19-MAR-21
Report Date: 01-APR-21 16:06 (MT)
Version: FINAL

Client Phone: 250-423-8854

Certificate of Analysis

Lab Work Order #: L2568715
Project P.O. #: NOT SUBMITTED
Job Reference: 18CANA02
C of C Numbers:
Legal Site Desc:

Patryk Wojciak, B.Sc., P.Chem.
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2568715-1	L2568715-2	L2568715-3	L2568715-4	L2568715-5
		Description	SURFACE WATE	SURFACE WATE	SURFACE WATE	SURFACE WATE	SURFACE WATE
		Sampled Date	17-MAR-21	17-MAR-21	17-MAR-21	17-MAR-21	17-MAR-21
		Sampled Time	14:50	16:30	17:20	15:45	15:00
		Client ID	MICH-39.1	MICH-33.8	MICH-13.0	AND1	DUPLICATE
Grouping	Analyte						
WATER							
Physical Tests	Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	<5.0	
	Hardness (as CaCO3) (mg/L)	547	378	213	143	551	
	Total Suspended Solids (mg/L)	6.1	3.1	7.3	3.3	3.9	
	Total Dissolved Solids (mg/L)	685 ^{DLHC}	431 ^{DLHC}	252 ^{DLHC}	155 ^{DLHC}	705 ^{DLHC}	
	Turbidity (NTU)	0.51	0.66	4.07	0.43	0.49	
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	218	182	155	131	222	
	Ammonia as N (mg/L)	0.0282	0.0054	0.0088	<0.0050	0.0054	
	Bicarbonate (HCO3) (mg/L)	266 ^{DLHC}	223	187	160	271	
	Bromide (Br) (mg/L)	<0.25 ^{DLHC}	<0.050	<0.050	<0.050	<0.050	
	Carbonate (CO3) (mg/L)	<5.0 ^{DLHC}	<5.0	<5.0	<5.0	<5.0	
	Chloride (Cl) (mg/L)	2.9	2.91	2.57	<0.50	3.37	
	Conductivity (EC) (uS/cm)	960	691	407	258	969	
	Fluoride (F) (mg/L)	<0.10 ^{DLHC}	0.130	0.082	0.244	0.080	
	Hydroxide (OH) (mg/L)	<5.0 ^{DLHC}	<5.0	<5.0	<5.0	<5.0	
	Nitrate (as N) (mg/L)	2.09 ^{DLHC}	1.33	0.314	0.157	2.36	
	Nitrite (as N) (mg/L)	0.0081 ^{DLHC}	0.0022	0.0020	0.0011	0.0043	
	Total Kjeldahl Nitrogen (mg/L)	0.606	0.223	0.192	0.073	0.379	
	pH (pH)	8.27	8.27	8.29	8.23	8.28	
	Orthophosphate-Dissolved (as P) (mg/L)	0.0020	0.0037	0.0062	0.0013	0.0015	
	Phosphorus (P)-Total (mg/L)	<0.0020 ^{DLHC}	0.0055	0.0059	<0.0020	<0.0020	
	Sulfate (SO4) (mg/L)	268	209	78.2	21.8	346	
	Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	0.77	0.68	0.82	<0.50	0.75
Total Organic Carbon (mg/L)		0.90	0.68	0.88	0.53	0.74	
Total Metals	Aluminum (Al)-Total (mg/L)	0.0135	0.0339	0.0971	0.0124	0.0126	
	Antimony (Sb)-Total (mg/L)	0.00015	0.00011	<0.00010	<0.00010	0.00014	
	Arsenic (As)-Total (mg/L)	0.00017	0.00024	0.00022	0.00042	0.00019	
	Barium (Ba)-Total (mg/L)	0.0674	0.0771	0.136	0.0222	0.0669	
	Beryllium (Be)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
	Boron (B)-Total (mg/L)	0.035	0.020	<0.010	<0.010	0.034	
	Cadmium (Cd)-Total (mg/L)	0.0000244	0.0000157	0.0000402	0.0000086	0.0000264	
	Calcium (Ca)-Total (mg/L)	136	102	65.4	45.7	133	
	Chromium (Cr)-Total (mg/L)	0.00026	0.00023	0.00025	0.00030	0.00020	
	Cobalt (Co)-Total (mg/L)	0.00096	0.00014	<0.00010	<0.00010	0.00093	
	Copper (Cu)-Total (mg/L)	0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Iron (Fe)-Total (mg/L)	0.019	0.038	0.071	<0.010	0.016	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L2568715-6	L2568715-7			
Description	SURFACE WATE	SURFACE WATE			
Sampled Date	17-MAR-21	17-MAR-21			
Sampled Time	17:30	10:00			
Client ID	FIELD BLANK	TRIP BLANK			
Grouping	Analyte				
WATER					
Physical Tests	Colour, True (CU)	<5.0	<5.0		
	Hardness (as CaCO3) (mg/L)	<0.50	<0.50		
	Total Suspended Solids (mg/L)	<3.0	<3.0		
	Total Dissolved Solids (mg/L)	<10	<10		
	Turbidity (NTU)	<0.10	<0.10		
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	<2.0	<2.0		
	Ammonia as N (mg/L)	<0.0050	0.0089 ^{RRV}		
	Bicarbonate (HCO3) (mg/L)	<5.0	<5.0		
	Bromide (Br) (mg/L)	<0.050	<0.050		
	Carbonate (CO3) (mg/L)	<5.0	<5.0		
	Chloride (Cl) (mg/L)	<0.50	<0.50		
	Conductivity (EC) (uS/cm)	<2.0	<2.0		
	Fluoride (F) (mg/L)	<0.020	<0.020		
	Hydroxide (OH) (mg/L)	<5.0	<5.0		
	Nitrate (as N) (mg/L)	<0.0050 ^{HTD}	<0.0050 ^{HTD}		
	Nitrite (as N) (mg/L)	<0.0010	<0.0010		
	Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050		
	pH (pH)	5.52	5.46		
	Orthophosphate-Dissolved (as P) (mg/L)	<0.0010	<0.0010		
	Phosphorus (P)-Total (mg/L)	<0.0020	<0.0020		
	Sulfate (SO4) (mg/L)	<0.30	<0.30		
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	<0.50	<0.50		
	Total Organic Carbon (mg/L)	<0.50	<0.50		
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0030	<0.0030		
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010		
	Arsenic (As)-Total (mg/L)	<0.00010	<0.00010		
	Barium (Ba)-Total (mg/L)	<0.00010	<0.00010		
	Beryllium (Be)-Total (mg/L)	<0.000020	<0.000020		
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050		
	Boron (B)-Total (mg/L)	<0.010	<0.010		
	Cadmium (Cd)-Total (mg/L)	<0.0000050	<0.0000050		
	Calcium (Ca)-Total (mg/L)	<0.050	<0.050		
	Chromium (Cr)-Total (mg/L)	<0.00010	<0.00010		
	Cobalt (Co)-Total (mg/L)	<0.00010	<0.00010		
	Copper (Cu)-Total (mg/L)	<0.00050	<0.00050		
	Iron (Fe)-Total (mg/L)	<0.010	<0.010		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L2568715-1 SURFACE WATE 17-MAR-21 14:50 MICH-39.1	L2568715-2 SURFACE WATE 17-MAR-21 16:30 MICH-33.8	L2568715-3 SURFACE WATE 17-MAR-21 17:20 MICH-13.0	L2568715-4 SURFACE WATE 17-MAR-21 15:45 AND1	L2568715-5 SURFACE WATE 17-MAR-21 15:00 DUPLICATE
Grouping	Analyte					
WATER						
Total Metals	Lead (Pb)-Total (mg/L)	<0.000050	<0.000050	0.000080	<0.000050	<0.000050
	Lithium (Li)-Total (mg/L)	0.0162	0.0112	0.0059	0.0021	0.0176
	Magnesium (Mg)-Total (mg/L)	60.5	38.0	18.2	9.54	58.9
	Manganese (Mn)-Total (mg/L)	0.00770	0.00248	0.00241	0.00016	0.00713
	Mercury (Hg)-Total (mg/L)	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
	Molybdenum (Mo)-Total (mg/L)	0.000868	0.000806	0.000665	0.000886	0.000855
	Nickel (Ni)-Total (mg/L)	0.0115	0.00279	0.00052	<0.00050	0.0112
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)	1.53	0.94	0.66	0.24	1.48
	Selenium (Se)-Total (mg/L)	0.00709	0.00529	0.00216	0.00173	0.00722
	Silicon (Si)-Total (mg/L)	2.15	1.96	2.23	1.44	2.15
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	17.5	11.0	5.10	0.807	17.1
	Strontium (Sr)-Total (mg/L)	0.439	0.319	0.180	0.161	0.430
	Sulfur (S)-Total (mg/L)	121	76.1	28.4	7.76	128
	Thallium (Tl)-Total (mg/L)	0.000012	<0.000010	<0.000010	0.000030	0.000014
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.00030	0.00075	0.00194	<0.00030	<0.00030
	Uranium (U)-Total (mg/L)	0.00250	0.00172	0.000736	0.000784	0.00249
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	0.00079	<0.00050	<0.00050
	Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	LAB	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	<0.0010	0.0033	0.0831	<0.0010	<0.0010
	Antimony (Sb)-Dissolved (mg/L)	0.00014	<0.00010	<0.00010	<0.00010	0.00014
	Arsenic (As)-Dissolved (mg/L)	0.00015	0.00019	0.00018	0.00047	0.00016
	Barium (Ba)-Dissolved (mg/L)	0.0711	0.0798	0.133	0.0235	0.0693
	Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Dissolved (mg/L)	0.032	0.018	<0.010	<0.010	0.032
	Cadmium (Cd)-Dissolved (mg/L)	0.0000273	0.0000206	0.0000434	0.0000088	0.0000216
	Calcium (Ca)-Dissolved (mg/L)	121	89.0	55.8	41.2	122
	Chromium (Cr)-Dissolved (mg/L)	0.00015	0.00015	0.00020	0.00023	0.00014
	Cobalt (Co)-Dissolved (mg/L)	0.00086	<0.00010	<0.00010	<0.00010	0.00087
	Copper (Cu)-Dissolved (mg/L)	<0.00020	0.00040	0.00035	<0.00020	<0.00020
	Iron (Fe)-Dissolved (mg/L)	<0.010	<0.010	0.043	<0.010	<0.010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2568715-6	L2568715-7		
		Description	SURFACE WATE	SURFACE WATE		
		Sampled Date	17-MAR-21	17-MAR-21		
		Sampled Time	17:30	10:00		
		Client ID	FIELD BLANK	TRIP BLANK		
Grouping	Analyte					
WATER						
Total Metals	Lead (Pb)-Total (mg/L)		<0.000050	<0.000050		
	Lithium (Li)-Total (mg/L)		<0.0010	<0.0010		
	Magnesium (Mg)-Total (mg/L)		<0.0050	<0.0050		
	Manganese (Mn)-Total (mg/L)		<0.00010	<0.00010		
	Mercury (Hg)-Total (mg/L)		<0.0000050	<0.0000050		
	Molybdenum (Mo)-Total (mg/L)		<0.000050	<0.000050		
	Nickel (Ni)-Total (mg/L)		<0.00050	<0.00050		
	Phosphorus (P)-Total (mg/L)		<0.050	<0.050		
	Potassium (K)-Total (mg/L)		<0.10	<0.10		
	Selenium (Se)-Total (mg/L)		<0.000050	<0.000050		
	Silicon (Si)-Total (mg/L)		<0.050	<0.050		
	Silver (Ag)-Total (mg/L)		<0.000010	<0.000010		
	Sodium (Na)-Total (mg/L)		<0.050	<0.050		
	Strontium (Sr)-Total (mg/L)		<0.00020	<0.00020		
	Sulfur (S)-Total (mg/L)		<0.50	<0.50		
	Thallium (Tl)-Total (mg/L)		<0.000010	<0.000010		
	Tin (Sn)-Total (mg/L)		<0.00010	<0.00010		
	Titanium (Ti)-Total (mg/L)		<0.00030	<0.00030		
	Uranium (U)-Total (mg/L)		<0.000010	<0.000010		
	Vanadium (V)-Total (mg/L)		<0.00050	<0.00050		
	Zinc (Zn)-Total (mg/L)		<0.0030	<0.0030		
	Zirconium (Zr)-Total (mg/L)		<0.00030	<0.00030		
Dissolved Metals	Dissolved Mercury Filtration Location		FIELD	FIELD		
	Dissolved Metals Filtration Location		FIELD	FIELD		
	Aluminum (Al)-Dissolved (mg/L)		<0.0010	<0.0010		
	Antimony (Sb)-Dissolved (mg/L)		<0.00010	<0.00010		
	Arsenic (As)-Dissolved (mg/L)		<0.00010	<0.00010		
	Barium (Ba)-Dissolved (mg/L)		<0.00010	<0.00010		
	Beryllium (Be)-Dissolved (mg/L)		<0.000020	<0.000020		
	Bismuth (Bi)-Dissolved (mg/L)		<0.000050	<0.000050		
	Boron (B)-Dissolved (mg/L)		<0.010	<0.010		
	Cadmium (Cd)-Dissolved (mg/L)		<0.0000050	<0.0000050		
	Calcium (Ca)-Dissolved (mg/L)		<0.050	<0.050		
	Chromium (Cr)-Dissolved (mg/L)		<0.00010	<0.00010		
	Cobalt (Co)-Dissolved (mg/L)		<0.00010	<0.00010		
	Copper (Cu)-Dissolved (mg/L)		<0.00020	<0.00020		
	Iron (Fe)-Dissolved (mg/L)		<0.010	<0.010		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2568715-1	L2568715-2	L2568715-3	L2568715-4	L2568715-5
		Description	SURFACE WATE				
		Sampled Date	17-MAR-21	17-MAR-21	17-MAR-21	17-MAR-21	17-MAR-21
		Sampled Time	14:50	16:30	17:20	15:45	15:00
		Client ID	MICH-39.1	MICH-33.8	MICH-13.0	AND1	DUPLICATE
Grouping	Analyte						
WATER							
Dissolved Metals	Lead (Pb)-Dissolved (mg/L)		<0.000050	<0.000050	0.000071	<0.000050	<0.000050
	Lithium (Li)-Dissolved (mg/L)		0.0214	0.0120	0.0066	0.0023	0.0204
	Magnesium (Mg)-Dissolved (mg/L)		59.7	37.7	17.9	9.68	60.1
	Manganese (Mn)-Dissolved (mg/L)		0.00663	0.00133	0.00244	<0.00010	0.00664
	Mercury (Hg)-Dissolved (mg/L)		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)		0.000906	0.000770	0.000608	0.000928	0.000904
	Nickel (Ni)-Dissolved (mg/L)		0.0110	0.00268	0.00053	<0.00050	0.0112
	Phosphorus (P)-Dissolved (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)		1.61	0.97	0.70	0.25	1.60
	Selenium (Se)-Dissolved (mg/L)		0.00814	0.00579	0.00243	0.00189	0.00838
	Silicon (Si)-Dissolved (mg/L)		2.21	1.91	2.23	1.46	2.24
	Silver (Ag)-Dissolved (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)		17.1	11.0	5.06	0.887	17.4
	Strontium (Sr)-Dissolved (mg/L)		0.444	0.319	0.179	0.168	0.447
	Sulfur (S)-Dissolved (mg/L)		124	74.4	27.3	7.79	125
	Thallium (Tl)-Dissolved (mg/L)		0.000012	<0.000010	<0.000010	0.000035	0.000012
	Tin (Sn)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)		<0.00030	<0.00030	0.00200	<0.00030	<0.00030
	Uranium (U)-Dissolved (mg/L)		0.00287	0.00190	0.000807	0.000905	0.00286
	Vanadium (V)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Dissolved (mg/L)		0.0016	0.0011	<0.0010	0.0017	0.0017
	Zirconium (Zr)-Dissolved (mg/L)		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Aggregate Organics	Chemical Oxygen Demand (mg/L)		<10	<10	<10	<10	<10
Volatile Organic Compounds	Acetone (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
	Acrolein (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
	Acrylonitrile (mg/L)		<0.020	<0.020	<0.020	<0.020	<0.020
	Benzene (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Bromobenzene (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bromochloromethane (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bromodichloromethane (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Bromoform (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Bromomethane (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	2-Butanone (MEK) (mg/L)		<0.020	<0.020	<0.020	<0.020	<0.020
	n-Butylbenzene (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	sec-Butylbenzene (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	tert-Butylbenzene (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L2568715-6 SURFACE WATE 17-MAR-21 17:30 FIELD BLANK	L2568715-7 SURFACE WATE 17-MAR-21 10:00 TRIP BLANK		
Grouping	Analyte				
WATER					
Dissolved Metals	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050		
	Lithium (Li)-Dissolved (mg/L)	<0.0010	<0.0010		
	Magnesium (Mg)-Dissolved (mg/L)	<0.0050	<0.0050		
	Manganese (Mn)-Dissolved (mg/L)	<0.00010	<0.00010		
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050		
	Molybdenum (Mo)-Dissolved (mg/L)	<0.000050	<0.000050		
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	<0.00050		
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050		
	Potassium (K)-Dissolved (mg/L)	<0.10	<0.10		
	Selenium (Se)-Dissolved (mg/L)	<0.000050	<0.000050		
	Silicon (Si)-Dissolved (mg/L)	<0.050	<0.050		
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010		
	Sodium (Na)-Dissolved (mg/L)	<0.050	<0.050		
	Strontium (Sr)-Dissolved (mg/L)	<0.00020	<0.00020		
	Sulfur (S)-Dissolved (mg/L)	<0.50	<0.50		
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010		
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010		
	Titanium (Ti)-Dissolved (mg/L)	<0.00030	<0.00030		
	Uranium (U)-Dissolved (mg/L)	<0.000010	<0.000010		
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050		
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	<0.0010		
	Zirconium (Zr)-Dissolved (mg/L)	<0.00030	<0.00030		
Aggregate Organics	Chemical Oxygen Demand (mg/L)	<10	<10		
Volatile Organic Compounds	Acetone (mg/L)	<0.050	<0.050		
	Acrolein (mg/L)	<0.050	<0.050		
	Acrylonitrile (mg/L)	<0.020	<0.020		
	Benzene (mg/L)	<0.00050	<0.00050		
	Bromobenzene (mg/L)	<0.0010	<0.0010		
	Bromochloromethane (mg/L)	<0.0010	<0.0010		
	Bromodichloromethane (mg/L)	<0.00050	<0.00050		
	Bromoform (mg/L)	<0.00050	<0.00050		
	Bromomethane (mg/L)	<0.0010	<0.0010		
	2-Butanone (MEK) (mg/L)	<0.020	<0.020		
	n-Butylbenzene (mg/L)	<0.0010	<0.0010		
	sec-Butylbenzene (mg/L)	<0.0010	<0.0010		
	tert-Butylbenzene (mg/L)	<0.0010	<0.0010		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L2568715-1 SURFACE WATE 17-MAR-21 14:50 MICH-39.1	L2568715-2 SURFACE WATE 17-MAR-21 16:30 MICH-33.8	L2568715-3 SURFACE WATE 17-MAR-21 17:20 MICH-13.0	L2568715-4 SURFACE WATE 17-MAR-21 15:45 AND1	L2568715-5 SURFACE WATE 17-MAR-21 15:00 DUPLICATE
Grouping	Analyte					
WATER						
Volatile Organic Compounds	Carbon disulfide (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Carbon tetrachloride (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Chlorobenzene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Dibromochloromethane (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Chloroethane (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Chloroform (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Chloromethane (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	2-Chlorotoluene (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	4-Chlorotoluene (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	1,2-Dibromo-3-chloropropane (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Ethylene dibromide (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Dibromomethane (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	cis-1,4-Dichloro-2-butene (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	trans-1,4-Dichloro-2-butene (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	1,2-Dichlorobenzene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	1,3-Dichlorobenzene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	1,4-Dichlorobenzene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Dichlorodifluoromethane (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	1,1-Dichloroethane (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	1,2-Dichloroethane (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	1,1-Dichloroethene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	cis-1,2-Dichloroethene (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	trans-1,2-Dichloroethene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Methylene chloride (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	0.0016
	1,2-Dichloropropane (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	1,3-Dichloropropane (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	2,2-Dichloropropane (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	1,1-Dichloropropene (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	cis-1,3-Dichloropropene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	trans-1,3-Dichloropropene (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Ethanol (mg/L)	<0.20	<0.20	<0.20	<0.20	0.33
	Ethyl methacrylate (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Ethylbenzene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Hexachlorobutadiene (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	2-Hexanone (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Iodomethane (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Isopropylbenzene (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L2568715-6 SURFACE WATE 17-MAR-21 17:30 FIELD BLANK	L2568715-7 SURFACE WATE 17-MAR-21 10:00 TRIP BLANK			
Grouping	Analyte				
WATER					
Volatile Organic Compounds	Carbon disulfide (mg/L)	<0.0010	<0.0010		
	Carbon tetrachloride (mg/L)	<0.00050	<0.00050		
	Chlorobenzene (mg/L)	<0.00050	<0.00050		
	Dibromochloromethane (mg/L)	<0.00050	<0.00050		
	Chloroethane (mg/L)	<0.0010	<0.0010		
	Chloroform (mg/L)	<0.00050	<0.00050		
	Chloromethane (mg/L)	<0.0010	<0.0010		
	2-Chlorotoluene (mg/L)	<0.0010	<0.0010		
	4-Chlorotoluene (mg/L)	<0.0010	<0.0010		
	1,2-Dibromo-3-chloropropane (mg/L)	<0.0010	<0.0010		
	Ethylene dibromide (mg/L)	<0.00050	<0.00050		
	Dibromomethane (mg/L)	<0.00050	<0.00050		
	cis-1,4-Dichloro-2-butene (mg/L)	<0.0050	<0.0050		
	trans-1,4-Dichloro-2-butene (mg/L)	<0.0050	<0.0050		
	1,2-Dichlorobenzene (mg/L)	<0.00050	<0.00050		
	1,3-Dichlorobenzene (mg/L)	<0.00050	<0.00050		
	1,4-Dichlorobenzene (mg/L)	<0.00050	<0.00050		
	Dichlorodifluoromethane (mg/L)	<0.00050	<0.00050		
	1,1-Dichloroethane (mg/L)	<0.00050	<0.00050		
	1,2-Dichloroethane (mg/L)	<0.0010	<0.0010		
	1,1-Dichloroethene (mg/L)	<0.00050	<0.00050		
	cis-1,2-Dichloroethene (mg/L)	<0.0010	<0.0010		
	trans-1,2-Dichloroethene (mg/L)	<0.00050	<0.00050		
	Methylene chloride (mg/L)	<0.0010	<0.0010		
	1,2-Dichloropropane (mg/L)	<0.00050	<0.00050		
	1,3-Dichloropropane (mg/L)	<0.0010	<0.0010		
	2,2-Dichloropropane (mg/L)	<0.0010	<0.0010		
	1,1-Dichloropropene (mg/L)	<0.0010	<0.0010		
	cis-1,3-Dichloropropene (mg/L)	<0.00050	<0.00050		
	trans-1,3-Dichloropropene (mg/L)	<0.0010	<0.0010		
	Ethanol (mg/L)	<0.20	<0.20		
	Ethyl methacrylate (mg/L)	<0.0050	<0.0050		
	Ethylbenzene (mg/L)	<0.00050	<0.00050		
	Hexachlorobutadiene (mg/L)	<0.0010	<0.0010		
	2-Hexanone (mg/L)	<0.0050	<0.0050		
	Iodomethane (mg/L)	<0.0010	<0.0010		
	Isopropylbenzene (mg/L)	<0.0010	<0.0010		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L2568715-1 SURFACE WATE 17-MAR-21 14:50 MICH-39.1	L2568715-2 SURFACE WATE 17-MAR-21 16:30 MICH-33.8	L2568715-3 SURFACE WATE 17-MAR-21 17:20 MICH-13.0	L2568715-4 SURFACE WATE 17-MAR-21 15:45 AND1	L2568715-5 SURFACE WATE 17-MAR-21 15:00 DUPLICATE
Grouping	Analyte					
WATER						
Volatile Organic Compounds	p-Isopropyltoluene (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	4-Methyl-2-pentanone (MIBK) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Methyl-t-butyl ether (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	n-Propylbenzene (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Styrene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	1,1,1,2-Tetrachloroethane (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	1,1,2,2-Tetrachloroethane (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Tetrachloroethylene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Toluene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	1,2,3-Trichlorobenzene (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	1,2,4-Trichlorobenzene (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	1,3,5-Trichlorobenzene (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	1,1,1-Trichloroethane (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	1,1,2-Trichloroethane (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Trichloroethene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Trichlorofluoromethane (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	1,2,3-Trichloropropane (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	1,2,4-Trimethylbenzene (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	1,3,5-Trimethylbenzene (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Vinyl chloride (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	o-Xylene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	m+p-Xylenes (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Xylenes (mg/L)	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Surrogate: 4-Bromofluorobenzene (%)	81.3	79.0	77.5	78.6	78.5	
Surrogate: 3,4-Dichlorotoluene (%)	125.7	128.4	118.1	123.7	124.8	
Surrogate: 1,4-Difluorobenzene (%)	97.5	96.6	96.2	95.0	96.2	
Hydrocarbons	EPH10-19 (ug/L)	<100	<100	<100	<100	<100
	EPH19-32 (ug/L)	<100	<100	<100	<100	<100
	Surrogate: 2-Bromobenzotrifluoride (%)	89.1	77.5	85.5	87.8	80.1

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L2568715-6 SURFACE WATE 17-MAR-21 17:30 FIELD BLANK	L2568715-7 SURFACE WATE 17-MAR-21 10:00 TRIP BLANK		
Grouping	Analyte				
WATER					
Volatile Organic Compounds	p-Isopropyltoluene (mg/L)	<0.0010	<0.0010		
	4-Methyl-2-pentanone (MIBK) (mg/L)	<0.0050	<0.0050		
	Methyl-t-butyl ether (mg/L)	<0.00050	<0.00050		
	n-Propylbenzene (mg/L)	<0.0010	<0.0010		
	Styrene (mg/L)	<0.00050	<0.00050		
	1,1,1,2-Tetrachloroethane (mg/L)	<0.0010	<0.0010		
	1,1,2,2-Tetrachloroethane (mg/L)	<0.00050	<0.00050		
	Tetrachloroethylene (mg/L)	<0.00050	<0.00050		
	Toluene (mg/L)	<0.00050	<0.00050		
	1,2,3-Trichlorobenzene (mg/L)	<0.0010	<0.0010		
	1,2,4-Trichlorobenzene (mg/L)	<0.0010	<0.0010		
	1,3,5-Trichlorobenzene (mg/L)	<0.0010	<0.0010		
	1,1,1-Trichloroethane (mg/L)	<0.00050	<0.00050		
	1,1,2-Trichloroethane (mg/L)	<0.00050	<0.00050		
	Trichloroethene (mg/L)	<0.00050	<0.00050		
	Trichlorofluoromethane (mg/L)	<0.0010	<0.0010		
	1,2,3-Trichloropropane (mg/L)	<0.00050	<0.00050		
	1,2,4-Trimethylbenzene (mg/L)	<0.0010	<0.0010		
	1,3,5-Trimethylbenzene (mg/L)	<0.0010	<0.0010		
	Vinyl chloride (mg/L)	<0.00050	<0.00050		
	o-Xylene (mg/L)	<0.00050	<0.00050		
	m+p-Xylenes (mg/L)	<0.00050	<0.00050		
	Xylenes (mg/L)	<0.00071	<0.00071		
	Surrogate: 4-Bromofluorobenzene (%)	77.5	77.8		
	Surrogate: 3,4-Dichlorotoluene (%)	118.5	126.9		
	Surrogate: 1,4-Difluorobenzene (%)	95.4	95.1		
Hydrocarbons	EPH10-19 (ug/L)	<100	<100		
	EPH19-32 (ug/L)	<100	<100		
	Surrogate: 2-Bromobenzotrifluoride (%)	89.3	92.6		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Qualifiers for Individual Parameters Listed:			
Qualifier	Description		
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).		
HTD	Hold time exceeded for re-analysis or dilution, but initial testing was conducted within hold time.		
RRV	Reported Result Verified By Repeat Analysis		

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BE-D-L-CCMS-CL	Water	Diss. Be (low) in Water by CRC ICPMS	APHA 3030B/6020A (mod)
Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
BE-T-L-CCMS-CL	Water	Total Be (Low) in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
BR-L-IC-N-CL	Water	Bromide in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
C-DIS-ORG-LOW-CL	Water	Dissolved Organic Carbon	APHA 5310 B-Instrumental
This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.			
The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC. TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.			
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.			
The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC. TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.			
CL-IC-N-CL	Water	Chloride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
COD-T-COL-CL	Water	Chemical Oxygen Demand (COD)	APHA 5220 D Colorimetry
Samples are analyzed using the closed reflux colourimetric method			
COLOUR-TRUE-CL	Water	Colour (True) by Spectrometer	APHA 2120 Color
True Colour is measured spectrophotometrically by comparison to platinum-cobalt standards using the single wavelength method (450 - 465 nm) after filtration of sample through a 0.45 um filter. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment. Concurrent measurement of sample pH is recommended.			
EPH-L-ME-FID-CL	Water	EPH (C10-C19) & EPH (C19-C32)	BC Lab manual
EPH is extracted from water using a hexane micro-extraction technique, with analysis by GC-FID, as per the BC Lab Manual. EPH results include PAHs and are therefore not equivalent to LEPH or HEPH.			
F-IC-N-CL	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
HARDNESS-CALC-CL	Water	Hardness	APHA 2340 B

Reference Information

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-CL	Water	Dissolved Mercury in Water by CVAAS	APHA 3030B/EPA 1631E (mod)
Water samples are filtered (0.45 µm), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
HG-T-CVAA-CL	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
MET-D-CCMS-CL	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)
Water samples are filtered (0.45 µm), preserved with nitric acid, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
MET-T-CCMS-CL	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
MTBE-ADD-CL	Water	MTBE - additional to BTEX	EPA 8260C/5021A
The water sample, with added reagents, is heated in a sealed vial to equilibrium. The headspace from the vial is transferred into a gas chromatograph. MTBE Target compound concentration is measured using mass spectrometry detection.			
NH3-L-F-CL	Water	Ammonia, Total (as N)	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
NO2-L-IC-N-CL	Water	Nitrite in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-L-IC-N-CL	Water	Nitrate in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
P-T-L-COL-CL	Water	Phosphorus (P)-Total	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH/EC/ALK-CL	Water	pH, Conductivity and Total Alkalinity	APHA 4500H,2510,2320
All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed)			
pH measurement is determined from the activity of the hydrogen ions using a hydrogen electrode and a reference electrode.			
Alkalinity measurement is based on the sample's capacity to neutralize acid			
Conductivity measurement is based on the sample's capacity to convey an electric current			
PO4-DO-L-COL-CL	Water	Orthophosphate-Dissolved (as P)	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.			
SO4-IC-N-CL	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TDS-CL	Water	Total Dissolved Solids	APHA 2540 C
A well-mixed sample is filtered through a glass fibre filter paper. The filtrate is then evaporated to dryness in a pre-weighed vial and dried at 180 – 2 °C. The increase in vial weight represents the total dissolved solids (TDS).			
TKN-L-F-CL	Water	Total Kjeldahl Nitrogen	APHA 4500-NORG (TKN)
This analysis is carried out using procedures adapted from APHA Method 4500-Norg D. "Block Digestion and Flow Injection Analysis". Total Kjeldahl Nitrogen is determined using block digestion followed by Flow-injection analysis with fluorescence detection.			
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.			
TURBIDITY-CL	Water	Turbidity	APHA 2130 B-Nephelometer
This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.			
VOC-HS-MS-CL	Water	VOCs in Water	EPA 8260C/5021A

Reference Information

The water sample, with added reagents, is heated in a sealed vial to equilibrium. The headspace from the vial is transferred into a gas chromatograph. VOC Target compound concentrations are measured using mass spectrometry detection.

XYLENES-CALC-CL Water Sum of Xylene Isomer Concentrations CALCULATION
Calculation of Total Xylenes

Total Xylenes is the sum of the concentrations of the ortho, meta, and para Xylene isomers. Results below detection limit (DL) are treated as zero. The DL for Total Xylenes is set to a value no less than the square root of the sum of the squares of the DLs of the individual Xylenes.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

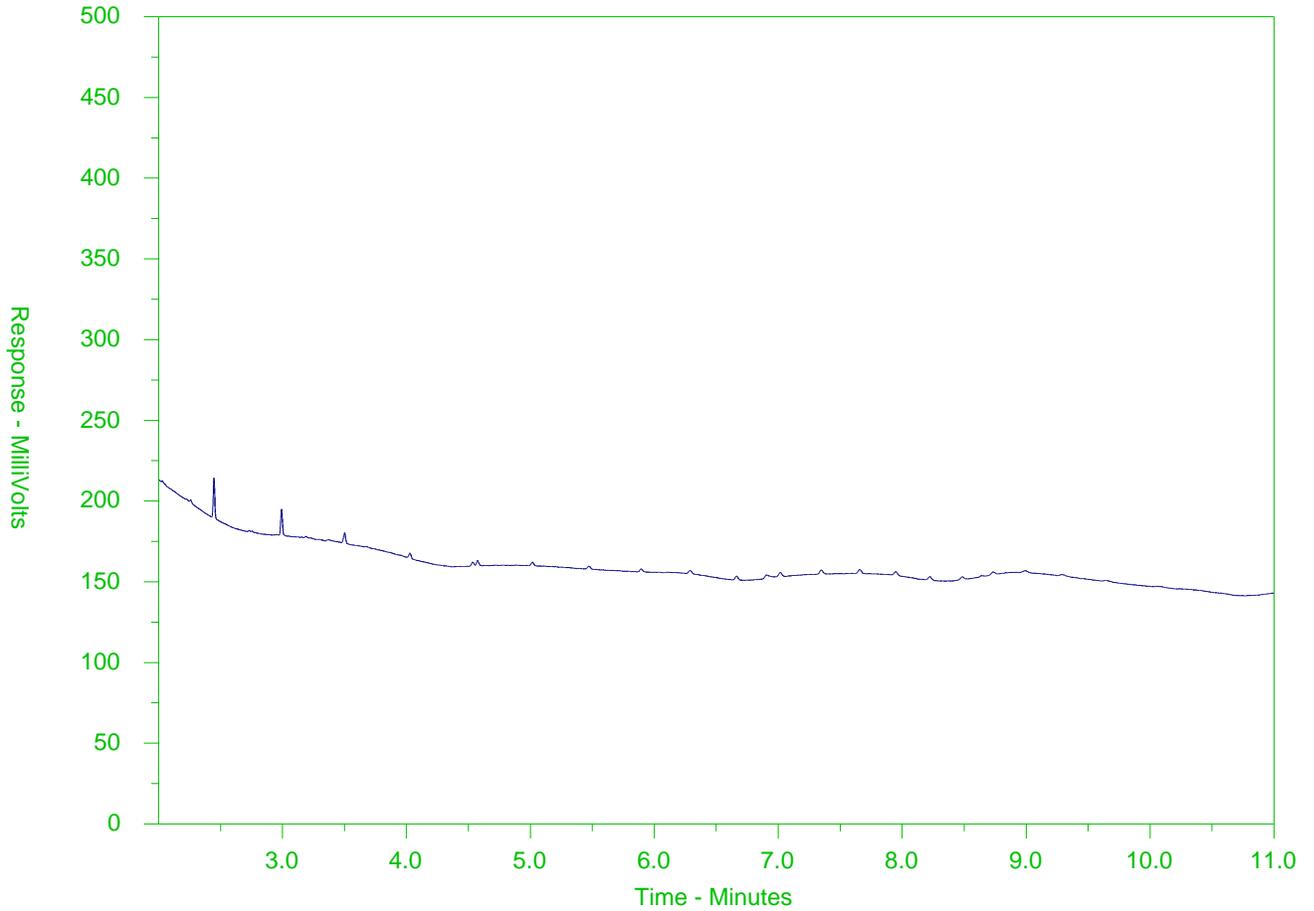
Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

BC EPH HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2568715-1
 Client Sample ID: MICH-39.1



← EPH10-19 →		← EPH19-32 →	
nC10	nC19	nC32	
174°C	330°C	467°C	
346°F	626°F	873°F	
← Gasoline →		← Motor Oils/ Lube Oils/ Grease →	
← Diesel/ Jet Fuels →			

The BC EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

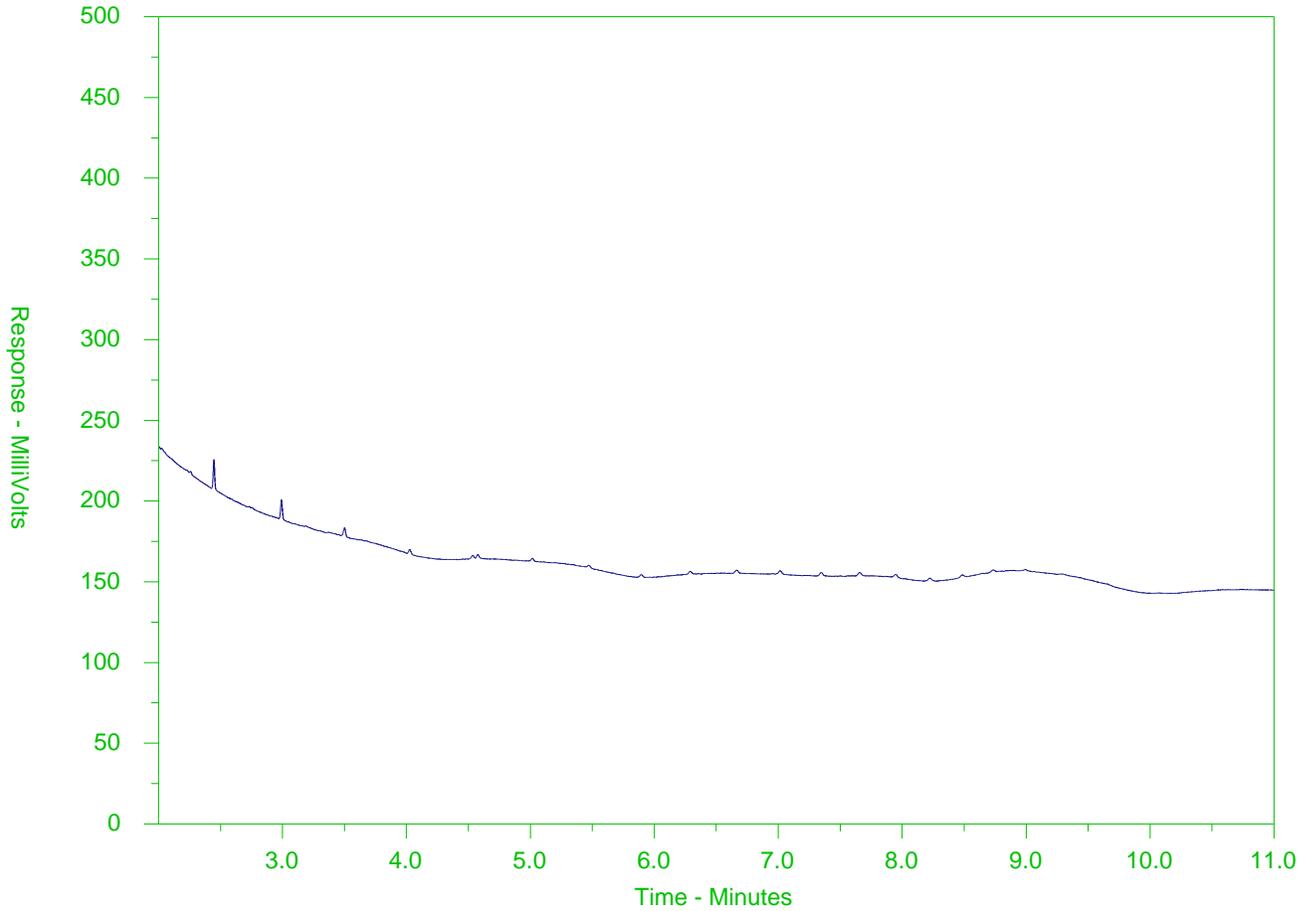
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Note: This chromatogram was produced using GC conditions that are specific to the ALS Canada EPH method. Refer to the ALS Canada EPH Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

BC EPH HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2568715-2
 Client Sample ID: MICH-33.8



← EPH10-19 →		← EPH19-32 →	
nC10	nC19	nC32	
174°C	330°C	467°C	
346°F	626°F	873°F	
← Gasoline →		← Motor Oils/ Lube Oils/ Grease →	
← Diesel/ Jet Fuels →			

The BC EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

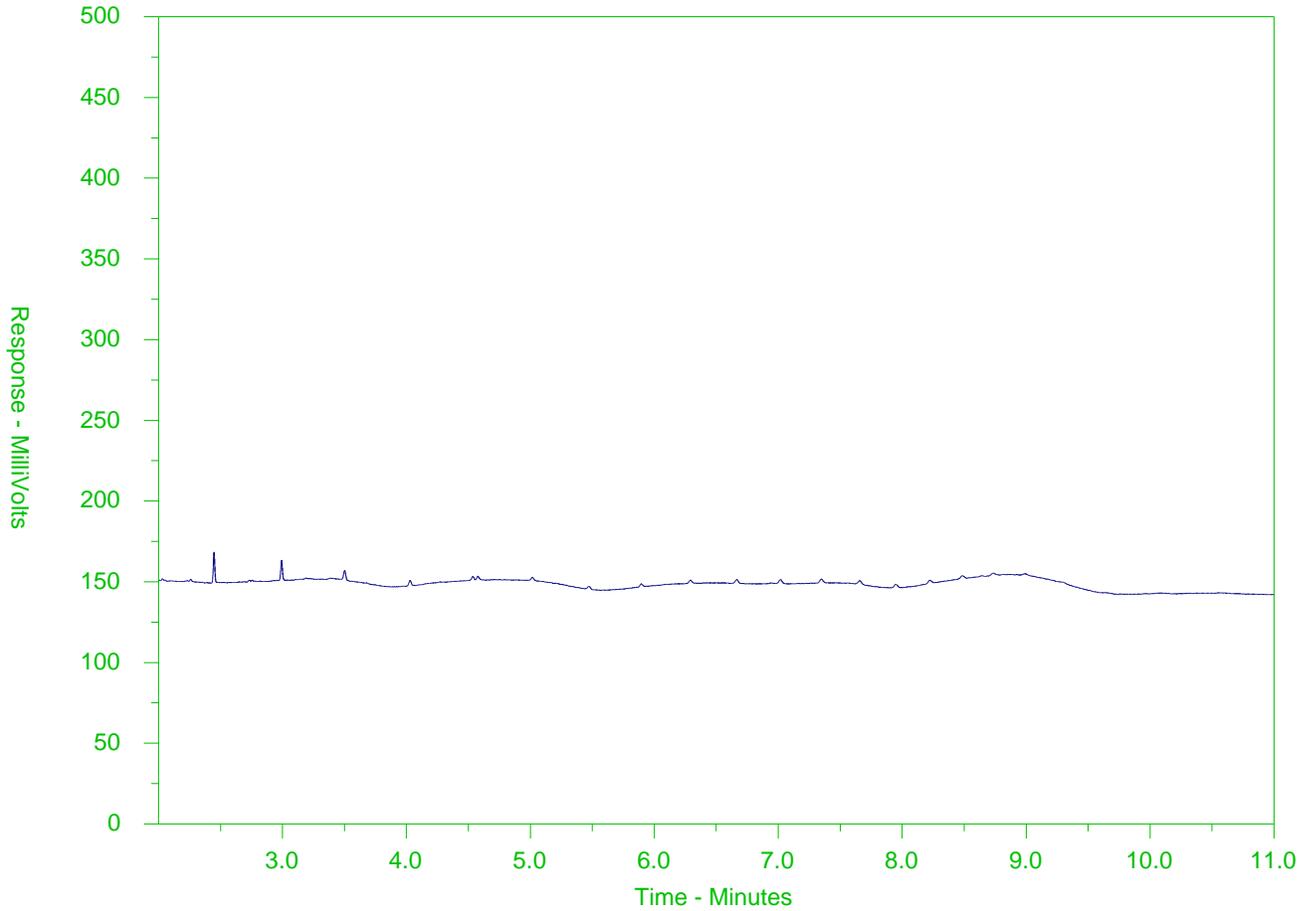
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Note: This chromatogram was produced using GC conditions that are specific to the ALS Canada EPH method. Refer to the ALS Canada EPH Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

BC EPH HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2568715-3
 Client Sample ID: MICH-13.0



← EPH10-19 →		← EPH19-32 →	
nC10	nC19	nC32	
174°C	330°C	467°C	
346°F	626°F	873°F	
← Gasoline →	← Motor Oils/ Lube Oils/ Grease →		
← Diesel/ Jet Fuels →			

The BC EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

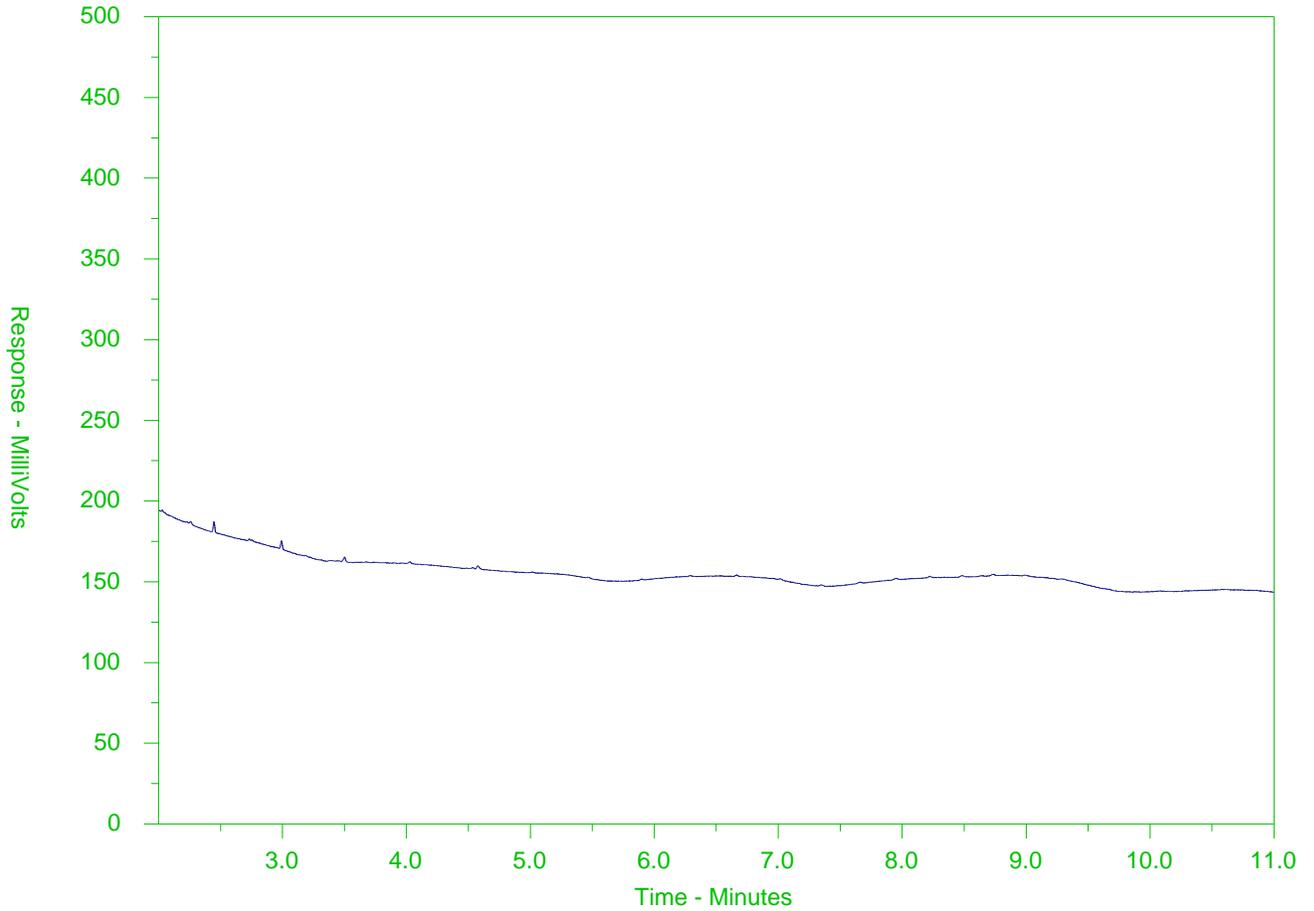
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Note: This chromatogram was produced using GC conditions that are specific to the ALS Canada EPH method. Refer to the ALS Canada EPH Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

BC EPH HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2568715-4
 Client Sample ID: AND1



← EPH10-19 →		← EPH19-32 →	
nC10	nC19	nC29	nC32
174°C	330°C	427°C	467°C
346°F	626°F	813°F	873°F
← Gasoline →		← Motor Oils/ Lube Oils/ Grease →	
← Diesel/ Jet Fuels →			

The BC EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

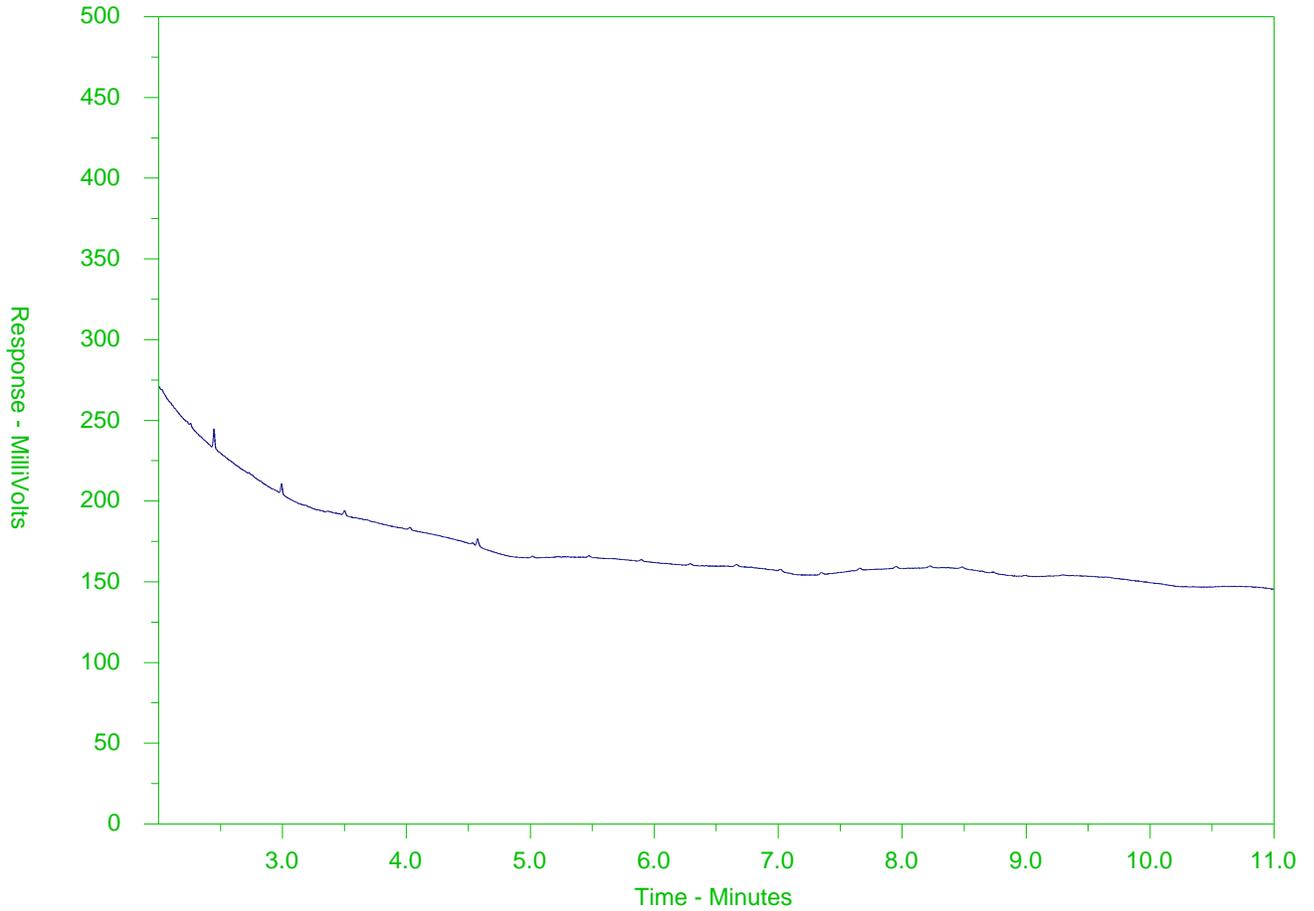
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Note: This chromatogram was produced using GC conditions that are specific to the ALS Canada EPH method. Refer to the ALS Canada EPH Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

BC EPH HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2568715-5
 Client Sample ID: DUPLICATE



← EPH10-19 →		← EPH19-32 →	
nC10	nC19	nC29	nC32
174°C	330°C	427°C	467°C
346°F	626°F	813°F	873°F
← Gasoline →		← Motor Oils/ Lube Oils/ Grease →	
← Diesel/ Jet Fuels →			

The BC EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

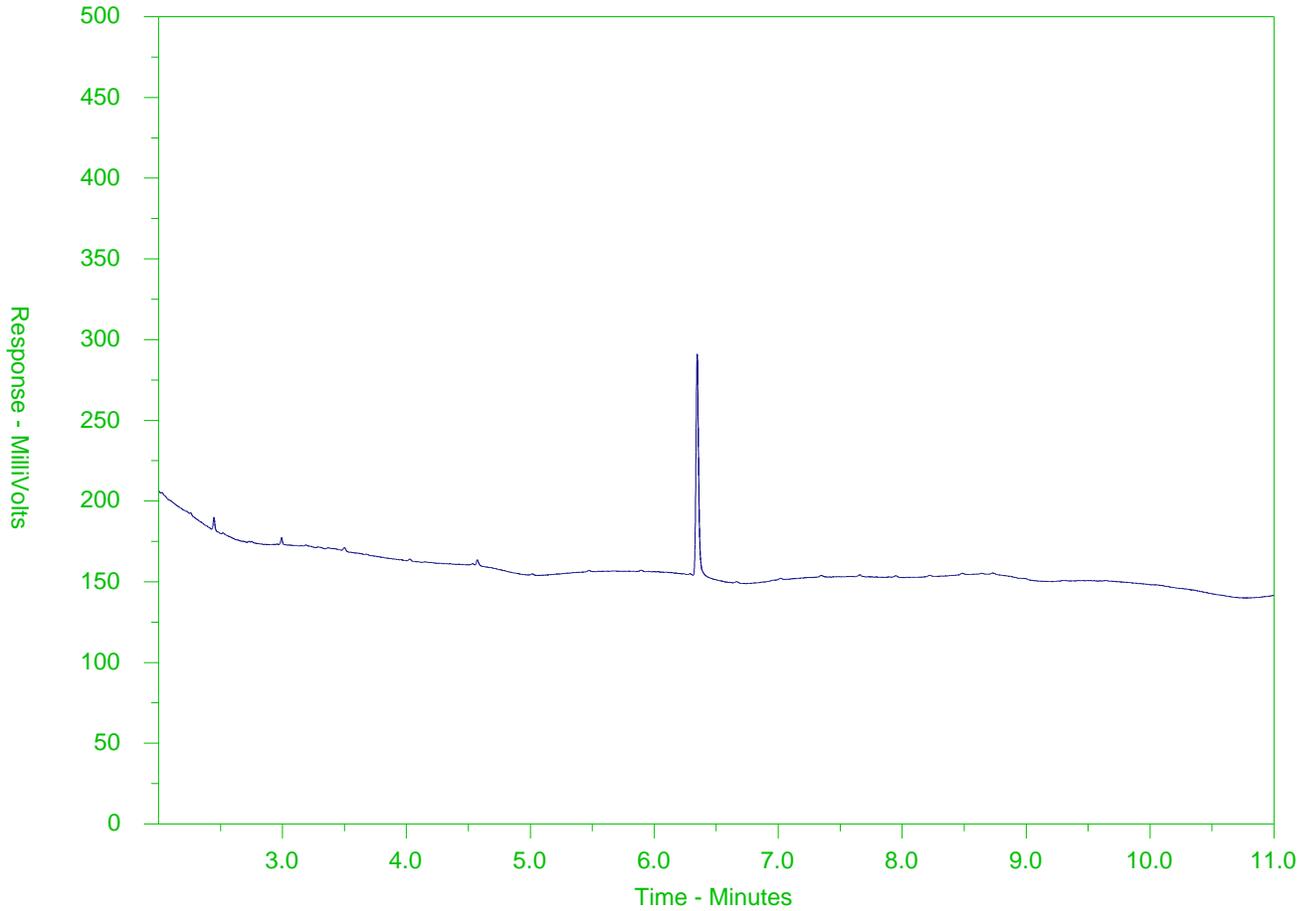
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Note: This chromatogram was produced using GC conditions that are specific to the ALS Canada EPH method. Refer to the ALS Canada EPH Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

BC EPH HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2568715-6
 Client Sample ID: FIELD BLANK



← EPH10-19 →		← EPH19-32 →	
nC10	nC19	nC32	
174°C	330°C	467°C	
346°F	626°F	873°F	
← Gasoline →		← Motor Oils/ Lube Oils/ Grease →	
← Diesel/ Jet Fuels →			

The BC EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

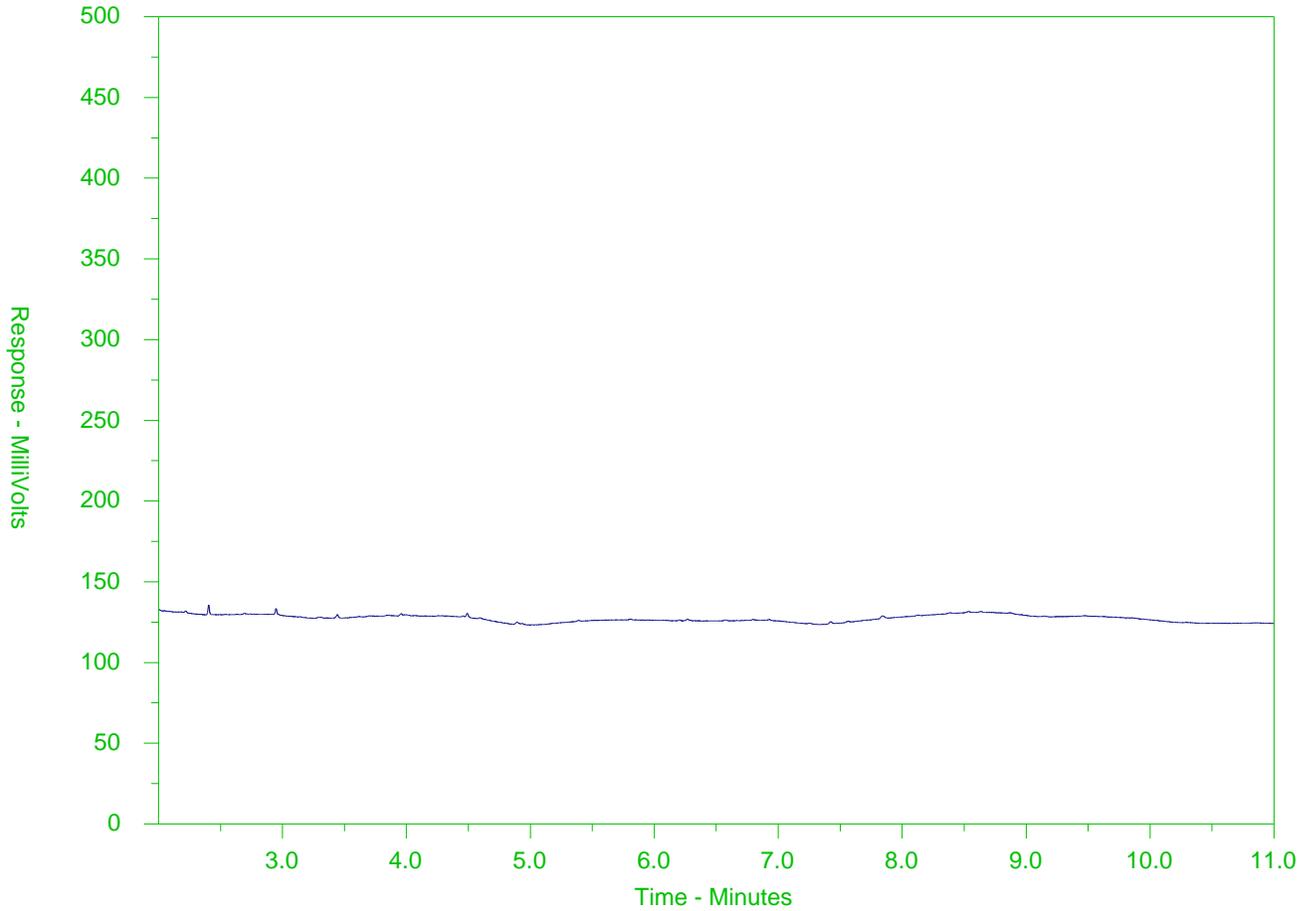
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Note: This chromatogram was produced using GC conditions that are specific to the ALS Canada EPH method. Refer to the ALS Canada EPH Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

BC EPH HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2568715-7
 Client Sample ID: TRIP BLANK



← EPH10-19 →		← EPH19-32 →	
nC10	nC19	nC32	
174°C	330°C	467°C	
346°F	626°F	873°F	
← Gasoline →	← Diesel/ Jet Fuels →		← Motor Oils/ Lube Oils/ Grease →

The BC EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Note: This chromatogram was produced using GC conditions that are specific to the ALS Canada EPH method. Refer to the ALS Canada EPH Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

