

CERTIFICATE OF ANALYSIS

REPORTED TO Newell Regional Services Corporation
P.O. Box 638
Brooks, AB T1R 1B6

ATTENTION Ryan Melrose

PO NUMBER 3565

PROJECT Winter Analysis 2019

PROJECT INFO Water Treatment Plant

WORK ORDER 0020105

RECEIVED / TEMP REPORTED 2020-02-04 08:53 / 5°C
2020-02-19 16:08

COC NUMBER No Number

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO 17025:2005 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks



You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry



It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve



Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

If you have any questions or concerns, please contact me at sgulenchyn@caro.ca

Authorized By:

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TEST RESULTS

REPORTED TO PROJECT Newell Regional Services Corporation
Winter Analysis 2019

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2020-02-19 16:08

Analyte	Result	RL	Units	Analyzed	Qualifier
Header #1 WTP Winter Analysis (0020105-01) Matrix: Water Sampled: 2020-02-03 13:00					
Acid Herbicides					
2,4,5-T	< 0.10	0.10	µg/L	2020-02-15	
2,4-D	< 0.10	0.10	µg/L	2020-02-15	
Dicamba	< 0.10	0.10	µg/L	2020-02-15	
Dinoseb	< 0.10	0.10	µg/L	2020-02-15	
MCPA	< 0.20	0.20	µg/L	2020-02-15	
Picloram	< 0.10	0.10	µg/L	2020-02-15	
Surrogate: 2,4-DCAA	112	60-126	%	2020-02-15	
Anions					
Bromate	< 0.010	0.010	mg/L	2020-02-05	
Chlorate	< 0.50	0.50	mg/L	2020-02-05	CST2
Chloride	16.6	0.10	mg/L	2020-02-05	
Chlorite	< 0.50	0.50	mg/L	2020-02-05	CST2
Fluoride	0.19	0.10	mg/L	2020-02-05	
Nitrate (as N)	< 0.010	0.010	mg/L	2020-02-05	
Nitrite (as N)	< 0.010	0.010	mg/L	2020-02-05	
Sulfate	60.8	1.0	mg/L	2020-02-05	
Calculated Parameters					
Chloramines	0.260	0.0400	mg/L	N/A	
Total Trihalomethanes	0.0262	0.00970	mg/L	N/A	
Hardness, Total (as CaCO3)	184	0.541	mg/L	N/A	
Solids, Total Dissolved	176	1.63	mg/L	N/A	
Chlorinated Phenols					
2-Chlorophenol	< 0.10	0.10	µg/L	2020-02-09	
3 & 4-Chlorophenol	< 0.10	0.10	µg/L	2020-02-09	
4-Chloro-3-Methylphenol	< 0.50	0.50	µg/L	2020-02-09	
2,3-Dichlorophenol	< 0.20	0.20	µg/L	2020-02-09	
2,4 & 2,5-Dichlorophenol	< 0.20	0.20	µg/L	2020-02-09	
2,6-Dichlorophenol	< 0.20	0.20	µg/L	2020-02-09	
3,4-Dichlorophenol	< 0.20	0.20	µg/L	2020-02-09	
3,5-Dichlorophenol	< 0.20	0.20	µg/L	2020-02-09	
2,3,4-Trichlorophenol	< 0.50	0.50	µg/L	2020-02-09	
2,3,5-Trichlorophenol	< 0.50	0.50	µg/L	2020-02-09	
2,3,6-Trichlorophenol	< 0.50	0.50	µg/L	2020-02-09	
2,4,5-Trichlorophenol	< 0.50	0.50	µg/L	2020-02-09	
2,4,6-Trichlorophenol	< 0.50	0.50	µg/L	2020-02-09	
3,4,5-Trichlorophenol	< 0.50	0.50	µg/L	2020-02-09	
2,3,4,5 & 2,3,5,6-Tetrachlorophenol	< 0.50	0.50	µg/L	2020-02-09	
2,3,4,6-Tetrachlorophenol	< 0.50	0.50	µg/L	2020-02-09	
Pentachlorophenol	< 0.50	0.50	µg/L	2020-02-09	
Surrogate: 2,4-Dibromophenol	73	60-130	%	2020-02-09	

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Header #1 WTP Winter Analysis (0020105-01) Matrix: Water Sampled: 2020-02-03 13:00, Continued					
Chlorinated Phenols, Continued					
Surrogate: 2,4,6-Tribromophenol	73	60-130	%	2020-02-09	
General Parameters					
Alkalinity, Total (as CaCO ₃)	149	2.0	mg/L	2020-02-06	
Bicarbonate (HCO ₃)	182	2.0	mg/L	2020-02-06	
Carbonate (CO ₃)	< 2.0	2.0	mg/L	2020-02-06	
Hydroxide (OH)	< 2.0	2.0	mg/L	2020-02-06	
Ammonia, Total (as N)	0.071	0.050	mg/L	2020-02-07	
Carbon, Total Organic	1.65	0.50	mg/L	2020-02-06	
Chlorine, Total	1.79	0.02	mg/L	2020-02-05	HT2
Chlorine, Free	1.53	0.02	mg/L	2020-02-05	HT2
Colour, True	< 5.0	5.0	CU	2020-02-06	
Conductivity (EC)	441	2.0	µS/cm	2020-02-11	
Cyanide, Total	< 0.0020	0.0020	mg/L	2020-02-06	
Nitritotriacetic Acid	< 0.20	0.20	mg/L	2020-02-06	
pH	7.33	0.10	pH units	2020-02-06	HT2
Sulfide, Total	< 0.020	0.020	mg/L	2020-02-05	
Turbidity	< 0.10	0.10	NTU	2020-02-04	
Haloacetic Acids					
Monochloroacetic Acid	< 0.0020	0.0020	mg/L	2020-02-11	
Monobromoacetic Acid	< 0.0020	0.0020	mg/L	2020-02-11	
Dichloroacetic Acid	0.0112	0.0020	mg/L	2020-02-11	
Trichloroacetic Acid	0.0136	0.0020	mg/L	2020-02-11	
Dibromoacetic Acid	< 0.0020	0.0020	mg/L	2020-02-11	
Total Haloacetic Acids (HAA5)	0.0248	0.00200	mg/L	N/A	
Surrogate: 2-Bromopropionic Acid	111	70-130	%	2020-02-11	
Microbiological Parameters					
Microcystin, total	0.16	0.14	µg/L	2020-02-10	
Miscellaneous Herbicides					
Glyphosate	< 0.050	0.050	mg/L	2020-02-14	
Miscellaneous Organics					
N-Nitrosodimethylamine	0.0020	0.0010	µg/L	2020-02-05	
Pesticides, Herbicides, and Fungicides					
Alachlor	< 0.100	0.100	µg/L	2020-02-15	
Aldrin	< 0.006	0.006	µg/L	2020-02-15	
Atrazine and metabolites	< 0.100	0.100	µg/L	2020-02-15	
Azinphos-methyl	< 0.200	0.200	µg/L	2020-02-15	
alpha-BHC	< 0.010	0.010	µg/L	2020-02-15	
beta-BHC	< 0.050	0.050	µg/L	2020-02-15	

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Header #1 WTP Winter Analysis (0020105-01) | Matrix: Water | Sampled: 2020-02-03 13:00, Continued

Pesticides, Herbicides, and Fungicides, Continued

delta-BHC	< 0.050	0.050	µg/L	2020-02-15	
gamma-BHC (Lindane)	< 0.050	0.050	µg/L	2020-02-15	
Bromacil	< 0.100	0.100	µg/L	2020-02-15	
Bromoxynil	< 0.200	0.200	µg/L	2020-02-15	
Butachlor	< 0.020	0.020	µg/L	2020-02-15	
Captan	< 0.100	0.100	µg/L	2020-02-15	
Chlordane (cis + trans)	< 0.050	0.050	µg/L	2020-02-15	
Chlorothalonil	< 0.050	0.050	µg/L	2020-02-15	
Chlorpyrifos	< 0.010	0.010	µg/L	2020-02-15	
Cyanazine	< 0.100	0.100	µg/L	2020-02-15	
DDT, Total	< 0.010	0.010	µg/L	2020-02-15	
Deltamethrin	< 0.100	0.100	µg/L	2020-02-15	
Diazinon	< 0.020	0.020	µg/L	2020-02-15	
Dichlorvos	< 0.100	0.100	µg/L	2020-02-15	
Diclofop-methyl	< 0.100	0.100	µg/L	2020-02-15	
Dieldrin	< 0.010	0.010	µg/L	2020-02-15	
Dimethoate	< 0.200	0.200	µg/L	2020-02-15	
Disulfoton	< 0.100	0.100	µg/L	2020-02-15	
Diuron	< 0.200	0.200	µg/L	2020-02-15	
Endosulfan I + II	< 0.010	0.010	µg/L	2020-02-15	
Endosulfan sulfate	< 0.050	0.050	µg/L	2020-02-15	
Endrin	< 0.020	0.020	µg/L	2020-02-15	
Endrin aldehyde	< 0.020	0.020	µg/L	2020-02-15	
Endrin ketone	< 0.020	0.020	µg/L	2020-02-15	
Fenchlorphos (Ronnell)	< 0.100	0.100	µg/L	2020-02-15	
Heptachlor	< 0.010	0.010	µg/L	2020-02-15	
Heptachlor epoxide	< 0.010	0.010	µg/L	2020-02-15	
Linuron	< 0.050	0.050	µg/L	2020-02-15	
Malathion	< 0.100	0.100	µg/L	2020-02-15	
Methoxychlor	< 0.050	0.050	µg/L	2020-02-15	
Methyl parathion	< 0.100	0.100	µg/L	2020-02-15	
Metolachlor	< 0.100	0.100	µg/L	2020-02-15	
Metribuzin	< 0.200	0.200	µg/L	2020-02-15	
Parathion	< 0.100	0.100	µg/L	2020-02-15	
Pentachloronitrobenzene	< 0.100	0.100	µg/L	2020-02-15	
Permethrin	< 0.010	0.010	µg/L	2020-02-15	
Phorate	< 0.100	0.100	µg/L	2020-02-15	
Prometon	< 0.300	0.300	µg/L	2020-02-15	
Prometryne	< 0.100	0.100	µg/L	2020-02-15	
Simazine	< 0.200	0.200	µg/L	2020-02-15	
Sulfotep	< 0.100	0.100	µg/L	2020-02-15	
Tebuthiuron	< 0.200	0.200	µg/L	2020-02-15	

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Pesticides, Herbicides, and Fungicides, Continued

Temephos (Abate)	< 0.500	0.500	µg/L	2020-02-15	
Terbufos	< 0.100	0.100	µg/L	2020-02-15	
Triallate	< 0.100	0.100	µg/L	2020-02-15	
Trifluralin	< 0.200	0.200	µg/L	2020-02-15	
Surrogate: Tributyl Phosphate	127	50-140	%	2020-02-15	
Surrogate: 4-chloro-3-nitrobenzotrifluoride	122	50-140	%	2020-02-15	

Polycyclic Aromatic Hydrocarbons (PAH)

Acenaphthene	< 0.050	0.050	µg/L	2020-02-09	
Acenaphthylene	< 0.200	0.200	µg/L	2020-02-09	
Acridine	< 0.050	0.050	µg/L	2020-02-09	
Anthracene	< 0.010	0.010	µg/L	2020-02-09	
Benz(a)anthracene	< 0.010	0.010	µg/L	2020-02-09	
Benzo(a)pyrene	< 0.010	0.010	µg/L	2020-02-09	
Benzo(b+j)fluoranthene	< 0.050	0.050	µg/L	2020-02-09	
Benzo(g,h,i)perylene	< 0.050	0.050	µg/L	2020-02-09	
Benzo(k)fluoranthene	< 0.050	0.050	µg/L	2020-02-09	
2-Chloronaphthalene	< 0.100	0.100	µg/L	2020-02-09	
Chrysene	< 0.050	0.050	µg/L	2020-02-09	
Dibenz(a,h)anthracene	< 0.010	0.010	µg/L	2020-02-09	
Fluoranthene	< 0.030	0.030	µg/L	2020-02-09	
Fluorene	< 0.050	0.050	µg/L	2020-02-09	
Indeno(1,2,3-cd)pyrene	< 0.050	0.050	µg/L	2020-02-09	
1-Methylnaphthalene	< 0.100	0.100	µg/L	2020-02-09	
2-Methylnaphthalene	< 0.100	0.100	µg/L	2020-02-09	
Naphthalene	< 0.200	0.200	µg/L	2020-02-09	
Phenanthrene	< 0.100	0.100	µg/L	2020-02-09	
Pyrene	< 0.020	0.020	µg/L	2020-02-09	
Quinoline	< 0.050	0.050	µg/L	2020-02-09	
Surrogate: Acridine-d9	49	50-140	%	2020-02-09	S02
Surrogate: Naphthalene-d8	87	50-140	%	2020-02-09	
Surrogate: Perylene-d12	84	50-140	%	2020-02-09	

Total Metals

Aluminum, total	0.291	0.0050	mg/L	2020-02-08	
Antimony, total	< 0.00020	0.00020	mg/L	2020-02-08	
Arsenic, total	0.00079	0.00050	mg/L	2020-02-08	
Barium, total	0.0860	0.0050	mg/L	2020-02-08	
Boron, total	0.0281	0.0050	mg/L	2020-02-08	
Cadmium, total	0.000017	0.000010	mg/L	2020-02-08	
Calcium, total	42.2	0.20	mg/L	2020-02-08	
Chromium, total	< 0.00050	0.00050	mg/L	2020-02-08	
Copper, total	0.00071	0.00040	mg/L	2020-02-08	

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Header #1 WTP Winter Analysis (0020105-01) | Matrix: Water | Sampled: 2020-02-03 13:00, Continued

Total Metals, Continued

Iron, total	< 0.010	0.010	mg/L	2020-02-08	
Lead, total	< 0.00020	0.00020	mg/L	2020-02-08	
Magnesium, total	19.0	0.010	mg/L	2020-02-08	
Manganese, total	0.00067	0.00020	mg/L	2020-02-08	
Mercury, total	< 0.000010	0.000010	mg/L	2020-02-06	
Potassium, total	2.16	0.10	mg/L	2020-02-08	
Selenium, total	< 0.00050	0.00050	mg/L	2020-02-08	
Silver, total	< 0.000050	0.000050	mg/L	2020-02-08	
Sodium, total	21.4	0.10	mg/L	2020-02-08	
Uranium, total	0.000764	0.000020	mg/L	2020-02-08	
Zinc, total	< 0.0040	0.0040	mg/L	2020-02-08	

Volatile Organic Compounds (VOC)

Benzene	< 0.5	0.5	µg/L	2020-02-07	S03
Bromodichloromethane	< 6.7	1.0	µg/L	2020-02-07	RA1
Bromoform	1.6	1.0	µg/L	2020-02-07	
Carbon tetrachloride	< 0.5	0.5	µg/L	2020-02-07	
Chlorobenzene	< 1.0	1.0	µg/L	2020-02-07	
Chloroethane	< 2.0	2.0	µg/L	2020-02-07	
Chloroform	23.4	1.0	µg/L	2020-02-07	
Dibromochloromethane	1.1	1.0	µg/L	2020-02-07	
1,2-Dibromoethane	< 0.3	0.3	µg/L	2020-02-07	
Dibromomethane	< 1.0	1.0	µg/L	2020-02-07	
1,2-Dichlorobenzene	< 0.5	0.5	µg/L	2020-02-07	
1,3-Dichlorobenzene	< 1.0	1.0	µg/L	2020-02-07	
1,4-Dichlorobenzene	< 1.0	1.0	µg/L	2020-02-07	
1,1-Dichloroethane	< 1.0	1.0	µg/L	2020-02-07	
1,2-Dichloroethane	< 1.0	1.0	µg/L	2020-02-07	
1,1-Dichloroethylene	< 1.0	1.0	µg/L	2020-02-07	
cis-1,2-Dichloroethylene	< 1.0	1.0	µg/L	2020-02-07	
trans-1,2-Dichloroethylene	< 1.0	1.0	µg/L	2020-02-07	
Dichloromethane	< 3.0	3.0	µg/L	2020-02-07	
1,2-Dichloropropane	< 1.0	1.0	µg/L	2020-02-07	
1,3-Dichloropropene (cis + trans)	< 1.0	1.0	µg/L	2020-02-07	
Ethylbenzene	< 1.0	1.0	µg/L	2020-02-07	
Methyl tert-butyl ether	< 1.0	1.0	µg/L	2020-02-07	
Styrene	< 1.0	1.0	µg/L	2020-02-07	
1,1,2,2-Tetrachloroethane	< 0.5	0.5	µg/L	2020-02-07	
Tetrachloroethylene	< 1.0	1.0	µg/L	2020-02-07	
Toluene	< 1.0	1.0	µg/L	2020-02-07	
1,1,1-Trichloroethane	< 1.0	1.0	µg/L	2020-02-07	
1,1,2-Trichloroethane	< 1.0	1.0	µg/L	2020-02-07	
Trichloroethylene	< 1.0	1.0	µg/L	2020-02-07	

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Header #1 WTP Winter Analysis (0020105-01) Matrix: Water Sampled: 2020-02-03 13:00, Continued					
Volatile Organic Compounds (VOC), Continued					S03
Trichlorofluoromethane	< 1.0	1.0	µg/L	2020-02-07	
Vinyl chloride	< 1.0	1.0	µg/L	2020-02-07	
Xylenes (total)	< 2.0	2.0	µg/L	2020-02-07	
Surrogate: Toluene-d8	38	70-130	%	2020-02-07	
Surrogate: 4-Bromofluorobenzene	85	70-130	%	2020-02-07	
Surrogate: 1,4-Dichlorobenzene-d4	83	70-130	%	2020-02-07	

Sample Qualifiers:

CST2 Subcontracted to AGAT

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

RA1 The Reporting Limit has been raised due to matrix interference.

S02 Surrogate recovery outside of control limits. Data accepted based on acceptable recovery of other surrogates.

S03 The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.

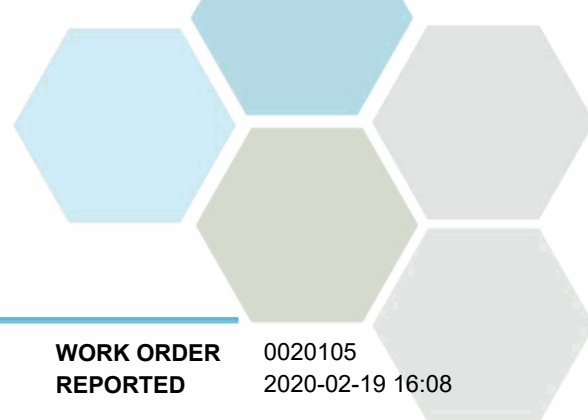
APPENDIX 1: SUPPORTING INFORMATION

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Analysis Description	Method Ref.	Technique	Location
Acid Herbicides in Water	EPA 8151A*	DCM Extraction with Diazomethane Derivatization, GC-MS	Richmond
Alkalinity in Water	SM 2320 B* (2017)	Titration with H ₂ SO ₄	Edmonton
Ammonia, Total in Water	SM 4500-NH ₃ D* (2017)	Ion Selective Electrode	Edmonton
Anions in Water	SM 4110 B (2017)	Ion Chromatography	Kelowna
Bromate in Water	SM 4110 B (2017)	Ion Chromatography	Sublet
Carbon, Total Organic in Water	SM 5310 B (2017)	Combustion, Infrared CO ₂ Detection	Kelowna
Chlorine, Free in Water	SM 4500-Cl G (2017)	Colorimetry (DPD)	Edmonton
Chlorine, Total in Water	SM 4500-Cl G (2017)	Colorimetry (DPD)	Edmonton
Colour, True in Water	SM 2120 C (2017)	Spectrophotometry (456 nm)	Edmonton
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	Edmonton
Cyanide, SAD in Water	ASTM D7511-12	Flow Injection with In-Line UV Digestion and Amperometry	Kelowna
Cyanobacterial Toxins in Water	EPA 546*	Adda Enzyme-Linked Immunosorbent Assay (ELISA)	Sublet
Glyphosate in Water	EPA 547*	Direct Aqueous Injection HPLC with Post-Column Derivatization and Fluorescence Detection	Richmond
Haloacetic Acids in Water	EPA 552.3*	Liquid-Liquid Microextraction, Derivatization and GC-ECD	Richmond
Hardness in Water	SM 2340 B (2017)	Calculation: 2.497 [diss Ca] + 4.118 [diss Mg]	N/A
Mercury, total in Water	EPA 245.7*	BrCl ₂ Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	Richmond
Nitrilotriacetic Acid in Water	EPA 430.1	Manual Colorimetry (Zinc-Zincon)	Kelowna
N-Nitrosodimethylamine in Water	In-House	N/A	Sublet
Pesticides in Water	EPA 3510C* / EPA 8270D*	Liquid-Liquid DCM Extraction (B/N) / GC-MSD (SIM)	Richmond
pH in Water	SM 4500-H+ B (2017)	Electrometry	Edmonton
Phenols, Chlorinated in Water	EPA 3510C* / EPA 8270D	Liquid-Liquid DCM Extraction (Acidic) / GC-MSD (SIM)	Richmond
Polycyclic Aromatic Hydrocarbons in Water	EPA 3511* / EPA 8270D	Hexane MicroExtraction (Base/Neutral) / GC-MSD (SIM)	Richmond
Solids, Total Dissolved in Water	SM 1030 E (2017)	SM 1030 E (2011)	N/A
Sulfide, Total in Water	SM 4500-S ₂ D* (2017)	Colorimetry (Methylene Blue)	Edmonton
Total Metals in Water	EPA 200.2* / EPA 6020B	HNO ₃ +HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	Richmond
Turbidity in Water	SM 2130 B (2017)	Nephelometry	Edmonton
Volatile Organic Compounds in Water	EPA 5030B / EPA 8260D	Purge&Trap / GC-MSD (SIM)	Richmond

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method



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Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
AO	Aesthetic Objective
CU	Colour Units (referenced against a platinum cobalt standard)
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
OG	Operational Guideline (treated water)
pH units	pH < 7 = acidic, pH > 7 = basic
µg/L	Micrograms per litre
µS/cm	Microsiemens per centimetre
ASTM	ASTM International Test Methods
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager: sgulenchyn@caro.ca

APPENDIX 2: QUALITY CONTROL RESULTS

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The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk):** A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup):** An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS):** A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS):** A second aliquot of sample is fortified with with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM):** A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Acid Herbicides, Batch B0B0441

Blank (B0B0441-BLK1)			Prepared: 2020-02-06, Analyzed: 2020-02-15						
2,4,5-T	< 0.10	0.10 µg/L							
2,4-D	< 0.10	0.10 µg/L							
Dicamba	< 0.10	0.10 µg/L							
Dinoseb	< 0.10	0.10 µg/L							
MCPA	< 0.20	0.20 µg/L							
Picloram	< 0.10	0.10 µg/L							
Surrogate: 2,4-DCAA	1.26	µg/L	1.01		125	60-126			
LCS (B0B0441-BS1)			Prepared: 2020-02-06, Analyzed: 2020-02-15						
2,4,5-T	0.72	0.10 µg/L	1.03		70	75-110			SPK
2,4-D	0.69	0.10 µg/L	1.03		67	71-110			SPK
Dicamba	0.75	0.10 µg/L	1.02		74	56-110			
Dinoseb	0.75	0.10 µg/L	1.09		69	52-110			
MCPA	58.0	2.00 µg/L	100		58	57-110			
Picloram	0.51	0.10 µg/L	1.05		49	50-110			SPK
Surrogate: 2,4-DCAA	1.21	µg/L	1.01		120	60-126			
LCS Dup (B0B0441-BSD1)			Prepared: 2020-02-06, Analyzed: 2020-02-15						
2,4,5-T	0.72	0.10 µg/L	1.03		70	75-110	< 1	30	SPK
2,4-D	0.71	0.10 µg/L	1.03		69	71-110	2	30	SPK
Dicamba	0.82	0.10 µg/L	1.02		80	56-110	9	30	
Dinoseb	0.76	0.10 µg/L	1.09		70	52-110	1	30	
MCPA	55.4	2.00 µg/L	100		55	57-110	5	30	SPK
Picloram	0.51	0.10 µg/L	1.05		48	50-110	1	30	SPK
Surrogate: 2,4-DCAA	1.33	µg/L	1.01		132	60-126			SPK

Anions, Batch B0B0235

Blank (B0B0235-BLK1)			Prepared: 2020-02-05, Analyzed: 2020-02-05						
Chloride	< 0.10	0.10 mg/L							
Fluoride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Sulfate	< 1.0	1.0 mg/L							

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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B0B0235, Continued									
LCS (B0B0235-BS1)				Prepared: 2020-02-05, Analyzed: 2020-02-05					
Chloride	16.0	0.10 mg/L	16.0		100	90-110			
Fluoride	4.00	0.10 mg/L	4.00		100	88-108			
Nitrate (as N)	4.01	0.010 mg/L	4.00		100	90-110			
Nitrite (as N)	2.01	0.010 mg/L	2.00		100	85-115			
Sulfate	16.0	1.0 mg/L	16.0		100	90-110			
Chlorinated Phenols, Batch B0B0610									
Blank (B0B0610-BLK1)				Prepared: 2020-02-08, Analyzed: 2020-02-09					
2-Chlorophenol	< 0.10	0.10 µg/L							
3 & 4-Chlorophenol	< 0.10	0.10 µg/L							
4-Chloro-3-Methylphenol	< 0.20	0.20 µg/L							
2,3-Dichlorophenol	< 0.20	0.20 µg/L							
2,4 & 2,5-Dichlorophenol	< 0.20	0.20 µg/L							
2,6-Dichlorophenol	< 0.20	0.20 µg/L							
3,4-Dichlorophenol	< 0.20	0.20 µg/L							
3,5-Dichlorophenol	< 0.20	0.20 µg/L							
2,3,4-Trichlorophenol	< 0.50	0.50 µg/L							
2,3,5-Trichlorophenol	< 0.50	0.50 µg/L							
2,3,6-Trichlorophenol	< 0.50	0.50 µg/L							
2,4,5-Trichlorophenol	< 0.50	0.50 µg/L							
2,4,6-Trichlorophenol	< 0.50	0.50 µg/L							
3,4,5-Trichlorophenol	< 0.50	0.50 µg/L							
2,3,4,5 & 2,3,5,6-Tetrachlorophenol	< 0.50	0.50 µg/L							
2,3,4,6-Tetrachlorophenol	< 0.50	0.50 µg/L							
Pentachlorophenol	< 0.50	0.50 µg/L							
Surrogate: 2,4-Dibromophenol	1.34	µg/L	2.02		66	60-130			
Surrogate: 2,4,6-Tribromophenol	1.24	µg/L	2.00		62	60-130			
LCS (B0B0610-BS1)				Prepared: 2020-02-08, Analyzed: 2020-02-09					
2-Chlorophenol	7.46	0.10 µg/L	10.0		75	60-108			
3 & 4-Chlorophenol	15.2	0.10 µg/L	20.1		76	60-120			
4-Chloro-3-Methylphenol	8.76	0.20 µg/L	10.1		87	60-140			
2,3-Dichlorophenol	7.84	0.20 µg/L	10.0		78	60-111			
2,4 & 2,5-Dichlorophenol	16.8	0.20 µg/L	20.2		83	60-116			
2,6-Dichlorophenol	8.33	0.20 µg/L	10.0		83	60-112			
3,4-Dichlorophenol	8.54	0.20 µg/L	10.0		85	60-120			
3,5-Dichlorophenol	8.54	0.20 µg/L	10.0		85	60-121			
2,3,4-Trichlorophenol	8.39	0.50 µg/L	10.0		84	60-122			
2,3,5-Trichlorophenol	8.84	0.50 µg/L	10.0		88	60-126			
2,3,6-Trichlorophenol	9.23	0.50 µg/L	10.0		92	60-130			
2,4,5-Trichlorophenol	7.97	0.50 µg/L	10.0		80	60-118			
2,4,6-Trichlorophenol	8.74	0.50 µg/L	10.0		87	60-120			
3,4,5-Trichlorophenol	8.52	0.50 µg/L	10.0		85	60-129			
2,3,4,5 & 2,3,5,6-Tetrachlorophenol	17.3	0.50 µg/L	20.0		86	60-127			
2,3,4,6-Tetrachlorophenol	10.2	0.50 µg/L	10.0		101	60-127			
Pentachlorophenol	10.8	0.50 µg/L	10.0		108	60-130			
Surrogate: 2,4-Dibromophenol	1.68	µg/L	2.02		83	60-130			
Surrogate: 2,4,6-Tribromophenol	1.72	µg/L	2.00		86	60-130			
LCS Dup (B0B0610-BS1)				Prepared: 2020-02-08, Analyzed: 2020-02-09					
2-Chlorophenol	8.01	0.10 µg/L	10.0		80	60-108	7	32	
3 & 4-Chlorophenol	16.1	0.10 µg/L	20.1		80	60-120	6	21	
4-Chloro-3-Methylphenol	9.15	0.20 µg/L	10.1		91	60-140	4	30	
2,3-Dichlorophenol	8.27	0.20 µg/L	10.0		83	60-111	5	27	

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Chlorinated Phenols, Batch B0B0610, Continued

LCS Dup (B0B0610-BSD1), Continued				Prepared: 2020-02-08, Analyzed: 2020-02-09					
2,4 & 2,5-Dichlorophenol	16.9	0.20 µg/L	20.2		83	60-116	< 1	22	
2,6-Dichlorophenol	8.93	0.20 µg/L	10.0		89	60-112	7	27	
3,4-Dichlorophenol	8.94	0.20 µg/L	10.0		89	60-120	5	22	
3,5-Dichlorophenol	8.93	0.20 µg/L	10.0		89	60-121	4	23	
2,3,4-Trichlorophenol	8.85	0.50 µg/L	10.0		88	60-122	5	26	
2,3,5-Trichlorophenol	9.54	0.50 µg/L	10.0		95	60-126	8	24	
2,3,6-Trichlorophenol	9.67	0.50 µg/L	10.0		97	60-130	5	26	
2,4,5-Trichlorophenol	9.52	0.50 µg/L	10.0		95	60-118	18	22	
2,4,6-Trichlorophenol	9.33	0.50 µg/L	10.0		93	60-120	6	26	
3,4,5-Trichlorophenol	10.0	0.50 µg/L	10.0		100	60-129	16	19	
2,3,4,5 & 2,3,5,6-Tetrachlorophenol	18.7	0.50 µg/L	20.0		93	60-127	8	26	
2,3,4,6-Tetrachlorophenol	10.2	0.50 µg/L	10.0		101	60-127	< 1	23	
Pentachlorophenol	11.5	0.50 µg/L	10.0		115	60-130	6	17	
Surrogate: 2,4-Dibromophenol	1.69	µg/L	2.02		83	60-130			
Surrogate: 2,4,6-Tribromophenol	1.72	µg/L	2.00		86	60-130			

General Parameters, Batch B0B0190

Blank (B0B0190-BLK1)				Prepared: 2020-02-06, Analyzed: 2020-02-06					
Carbon, Total Organic	< 0.50	0.50 mg/L							
LCS (B0B0190-BS1)				Prepared: 2020-02-06, Analyzed: 2020-02-06					
Carbon, Total Organic	9.44	0.50 mg/L	10.0		94	78-116			

General Parameters, Batch B0B0202

Blank (B0B0202-BLK1)				Prepared: 2020-02-04, Analyzed: 2020-02-04					
Turbidity	< 0.10	0.10 NTU							
LCS (B0B0202-BS1)				Prepared: 2020-02-04, Analyzed: 2020-02-04					
Turbidity	37.5	0.10 NTU	40.0		94	90-110			
Duplicate (B0B0202-DUP1)				Source: 0020105-01		Prepared: 2020-02-04, Analyzed: 2020-02-04			
Turbidity	< 0.10	0.10 NTU		< 0.10				10	

General Parameters, Batch B0B0241

Blank (B0B0241-BLK1)				Prepared: 2020-02-05, Analyzed: 2020-02-05					
Chlorine, Total	< 0.02	0.02 mg/L							
Chlorine, Free	< 0.02	0.02 mg/L							
Duplicate (B0B0241-DUP1)				Source: 0020105-01		Prepared: 2020-02-05, Analyzed: 2020-02-05			
Chlorine, Total	1.80	0.02 mg/L	1.79			< 1		10	
Chlorine, Free	1.56	0.02 mg/L	1.53			2		20	
Reference (B0B0241-SRM1)				Prepared: 2020-02-05, Analyzed: 2020-02-05					
Chlorine, Total	1.58	0.02 mg/L	1.59		99	91.2-108.8			
Chlorine, Free	1.58	0.02 mg/L	1.59		99	91.2-108.8			

General Parameters, Batch B0B0272

Blank (B0B0272-BLK1)				Prepared: 2020-02-06, Analyzed: 2020-02-06					
Cyanide, Total	< 0.0020	0.0020 mg/L							

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General Parameters, Batch B0B0272, Continued									
LCS (B0B0272-BS1)				Prepared: 2020-02-06, Analyzed: 2020-02-06					
Cyanide, Total	0.0189	0.0020 mg/L	0.0200		94	82-120			
LCS Dup (B0B0272-BSD1)				Prepared: 2020-02-06, Analyzed: 2020-02-06					
Cyanide, Total	0.0193	0.0020 mg/L	0.0200		96	82-120	2	10	
General Parameters, Batch B0B0306									
Blank (B0B0306-BLK1)				Prepared: 2020-02-05, Analyzed: 2020-02-05					
Sulfide, Total	< 0.020	0.020 mg/L							
LCS (B0B0306-BS1)				Prepared: 2020-02-05, Analyzed: 2020-02-05					
Sulfide, Total	0.590	0.020 mg/L	0.530		111	80-120			
General Parameters, Batch B0B0393									
Blank (B0B0393-BLK1)				Prepared: 2020-02-06, Analyzed: 2020-02-06					
Colour, True	< 5.0	5.0 CU							
LCS (B0B0393-BS1)				Prepared: 2020-02-06, Analyzed: 2020-02-06					
Colour, True	21	5.0 CU	20.0		107	90-109			
Duplicate (B0B0393-DUP1)				Source: 0020105-01		Prepared: 2020-02-06, Analyzed: 2020-02-06			
Colour, True	< 5.0	5.0 CU	< 5.0					8	
General Parameters, Batch B0B0397									
Blank (B0B0397-BLK1)				Prepared: 2020-02-06, Analyzed: 2020-02-06					
Alkalinity, Total (as CaCO ₃)	< 2.0	2.0 mg/L							
Bicarbonate (HCO ₃)	< 2.0	2.0 mg/L							
Carbonate (CO ₃)	< 2.0	2.0 mg/L							
Hydroxide (OH)	< 2.0	2.0 mg/L							
LCS (B0B0397-BS1)				Prepared: 2020-02-06, Analyzed: 2020-02-06					
Alkalinity, Total (as CaCO ₃)	242	2.0 mg/L	250		97	94-108			
General Parameters, Batch B0B0399									
Reference (B0B0399-SRM1)				Prepared: 2020-02-06, Analyzed: 2020-02-06					
pH	7.02	0.10 pH units	7.00		100	98-102			
General Parameters, Batch B0B0446									
Blank (B0B0446-BLK1)				Prepared: 2020-02-06, Analyzed: 2020-02-06					
Nitritotriacetic Acid	< 0.20	0.20 mg/L							
LCS (B0B0446-BS1)				Prepared: 2020-02-06, Analyzed: 2020-02-06					
Nitritotriacetic Acid	1.04	0.20 mg/L	1.00		104	80-120			
General Parameters, Batch B0B0511									
Blank (B0B0511-BLK1)				Prepared: 2020-02-07, Analyzed: 2020-02-07					
Ammonia, Total (as N)	< 0.050	0.050 mg/L							

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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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General Parameters, Batch B0B0511, Continued

LCS (B0B0511-BS1)				Prepared: 2020-02-07, Analyzed: 2020-02-07					
Ammonia, Total (as N)	0.199	0.050 mg/L	0.200		100	85-115			

General Parameters, Batch B0B0754

Blank (B0B0754-BLK1)				Prepared: 2020-02-11, Analyzed: 2020-02-11					
Conductivity (EC)	< 2.0	2.0 µS/cm							
LCS (B0B0754-BS1)				Prepared: 2020-02-11, Analyzed: 2020-02-11					
Conductivity (EC)	1410	2.0 µS/cm	1410		100	95-105			

Haloacetic Acids, Batch B0B0651

Blank (B0B0651-BLK1)				Prepared: 2020-02-09, Analyzed: 2020-02-10					
Monochloroacetic Acid	< 0.0020	0.0020 mg/L							
Monobromoacetic Acid	< 0.0020	0.0020 mg/L							
Dichloroacetic Acid	< 0.0020	0.0020 mg/L							
Trichloroacetic Acid	< 0.0020	0.0020 mg/L							
Dibromoacetic Acid	< 0.0020	0.0020 mg/L							
Surrogate: 2-Bromopropionic Acid	0.0152	mg/L	0.0116		131	70-130			S02
LCS (B0B0651-BS1)				Prepared: 2020-02-09, Analyzed: 2020-02-10					
Monochloroacetic Acid	0.0883	0.0020 mg/L	0.0930		95	75-117			
Monobromoacetic Acid	0.0912	0.0020 mg/L	0.0940		97	83-113			
Dichloroacetic Acid	0.0915	0.0020 mg/L	0.0930		98	78-112			
Trichloroacetic Acid	0.0915	0.0020 mg/L	0.0930		98	81-110			
Dibromoacetic Acid	0.0915	0.0020 mg/L	0.0930		98	89-112			
Surrogate: 2-Bromopropionic Acid	0.0113	mg/L	0.0116		97	70-130			
LCS Dup (B0B0651-BS1)				Prepared: 2020-02-09, Analyzed: 2020-02-10					
Monochloroacetic Acid	0.0978	0.0020 mg/L	0.0930		105	75-117	10	30	
Monobromoacetic Acid	0.0963	0.0020 mg/L	0.0940		102	83-113	5	30	
Dichloroacetic Acid	0.0945	0.0020 mg/L	0.0930		102	78-112	3	30	
Trichloroacetic Acid	0.0947	0.0020 mg/L	0.0930		102	81-110	3	30	
Dibromoacetic Acid	0.0947	0.0020 mg/L	0.0930		102	89-112	3	30	
Surrogate: 2-Bromopropionic Acid	0.0120	mg/L	0.0116		103	70-130			

Miscellaneous Herbicides, Batch B0B1219

Blank (B0B1219-BLK1)				Prepared: 2020-02-14, Analyzed: 2020-02-14					
Glyphosate	< 0.050	0.050 mg/L							
LCS (B0B1219-BS1)				Prepared: 2020-02-14, Analyzed: 2020-02-14					
Glyphosate	0.196	0.050 mg/L	0.250		78	70-130			
LCS (B0B1219-BS2)				Prepared: 2020-02-14, Analyzed: 2020-02-14					
Glyphosate	0.201	0.050 mg/L	0.250		80	70-130			

Pesticides, Herbicides, and Fungicides, Batch B0B0731

Blank (B0B0731-BLK1)				Prepared: 2020-02-10, Analyzed: 2020-02-15					
Alachlor	< 0.100	0.100 µg/L							
Aldrin	< 0.006	0.006 µg/L							
Atrazine and metabolites	< 0.100	0.100 µg/L							
Azinphos-methyl	< 0.200	0.200 µg/L							

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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Pesticides, Herbicides, and Fungicides, Batch B0B0731, Continued									
Blank (B0B0731-BLK1), Continued					Prepared: 2020-02-10, Analyzed: 2020-02-15				
alpha-BHC	< 0.010	0.010 µg/L							
beta-BHC	< 0.050	0.050 µg/L							
delta-BHC	< 0.050	0.050 µg/L							
gamma-BHC (Lindane)	< 0.050	0.050 µg/L							
Bromacil	< 0.100	0.100 µg/L							
Bromoxynil	< 0.200	0.200 µg/L							
Butachlor	< 0.020	0.020 µg/L							
Captan	< 0.100	0.100 µg/L							
Chlordane (cis + trans)	< 0.050	0.050 µg/L							
Chlorothalonil	< 0.050	0.050 µg/L							
Chlorpyrifos	< 0.010	0.010 µg/L							
Cyanazine	< 0.100	0.100 µg/L							
DDT, Total	< 0.010	0.010 µg/L							
Deltamethrin	< 0.100	0.100 µg/L							
Diazinon	< 0.020	0.020 µg/L							
Dichlorvos	< 0.100	0.100 µg/L							
Diclofop-methyl	< 0.100	0.100 µg/L							
Dieldrin	< 0.010	0.010 µg/L							
Dimethoate	< 0.200	0.200 µg/L							
Disulfoton	< 0.100	0.100 µg/L							
Diuron	< 0.200	0.200 µg/L							
Endosulfan I + II	< 0.010	0.010 µg/L							
Endosulfan sulfate	< 0.050	0.050 µg/L							
Endrin	< 0.020	0.020 µg/L							
Endrin aldehyde	< 0.020	0.020 µg/L							
Endrin ketone	< 0.020	0.020 µg/L							
Fenchlorphos (Ronnel)	< 0.100	0.100 µg/L							
Heptachlor	< 0.010	0.010 µg/L							
Heptachlor epoxide	< 0.010	0.010 µg/L							
Linuron	< 0.050	0.050 µg/L							
Malathion	< 0.100	0.100 µg/L							
Methoxychlor	< 0.050	0.050 µg/L							
Methyl parathion	< 0.100	0.100 µg/L							
Metolachlor	< 0.100	0.100 µg/L							
Metribuzin	< 0.200	0.200 µg/L							
Parathion	< 0.100	0.100 µg/L							
Pentachloronitrobenzene	< 0.100	0.100 µg/L							
Permethrin	< 0.010	0.010 µg/L							
Phorate	< 0.100	0.100 µg/L							
Prometon	< 0.300	0.300 µg/L							
Prometryne	< 0.100	0.100 µg/L							
Simazine	< 0.200	0.200 µg/L							
Sulfotep	< 0.100	0.100 µg/L							
Tebuthiuron	< 0.200	0.200 µg/L							
Temephos (Abate)	< 0.500	0.500 µg/L							
Terbufos	< 0.100	0.100 µg/L							
Triallate	< 0.100	0.100 µg/L							
Trifluralin	< 0.200	0.200 µg/L							
Surrogate: Tributyl Phosphate	1.33	µg/L	1.00		133	50-140			
Surrogate: 4-chloro-3-nitrobenzotrifluoride	1.32	µg/L	1.00		132	50-140			

Polycyclic Aromatic Hydrocarbons (PAH), Batch B0B0437

Blank (B0B0437-BLK1)					Prepared: 2020-02-06, Analyzed: 2020-02-06				
Acenaphthene	< 0.050	0.050 µg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Newell Regional Services Corporation
Winter Analysis 2019

WORK ORDER REPORTED 0020105
2020-02-19 16:08

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Polycyclic Aromatic Hydrocarbons (PAH), Batch B0B0437, Continued									
Blank (B0B0437-BLK1), Continued					Prepared: 2020-02-06, Analyzed: 2020-02-06				
Acenaphthylene	< 0.200	0.200 µg/L							
Acridine	< 0.050	0.050 µg/L							
Anthracene	< 0.010	0.010 µg/L							
Benz(a)anthracene	< 0.010	0.010 µg/L							
Benzo(a)pyrene	< 0.010	0.010 µg/L							
Benzo(b+j)fluoranthene	< 0.050	0.050 µg/L							
Benzo(g,h,i)perylene	< 0.050	0.050 µg/L							
Benzo(k)fluoranthene	< 0.050	0.050 µg/L							
2-Chloronaphthalene	< 0.100	0.100 µg/L							
Chrysene	< 0.050	0.050 µg/L							
Dibenz(a,h)anthracene	< 0.010	0.010 µg/L							
Fluoranthene	< 0.030	0.030 µg/L							
Fluorene	< 0.050	0.050 µg/L							
Indeno(1,2,3-cd)pyrene	< 0.050	0.050 µg/L							
1-Methylnaphthalene	< 0.100	0.100 µg/L							
2-Methylnaphthalene	< 0.100	0.100 µg/L							
Naphthalene	< 0.200	0.200 µg/L							
Phenanthrene	< 0.100	0.100 µg/L							
Pyrene	< 0.020	0.020 µg/L							
Quinoline	< 0.050	0.050 µg/L							
Surrogate: Acridine-d9	2.77	µg/L	4.47		62	50-140			
Surrogate: Naphthalene-d8	4.09	µg/L	4.47		92	50-140			
Surrogate: Perylene-d12	4.43	µg/L	4.47		99	50-140			
LCS (B0B0437-BS1)					Prepared: 2020-02-06, Analyzed: 2020-02-06				
Acenaphthene	4.51	0.050 µg/L	4.44		102	55-137			
Acenaphthylene	4.63	0.200 µg/L	4.44		104	53-140			
Acridine	3.64	0.050 µg/L	4.24		86	50-120			
Anthracene	4.40	0.010 µg/L	4.44		99	64-130			
Benz(a)anthracene	4.86	0.010 µg/L	4.44		109	57-140			
Benzo(a)pyrene	4.71	0.010 µg/L	4.44		106	63-133			
Benzo(b+j)fluoranthene	9.50	0.050 µg/L	8.89		107	60-129			
Benzo(g,h,i)perylene	4.86	0.050 µg/L	4.44		109	52-139			
Benzo(k)fluoranthene	4.05	0.050 µg/L	4.44		91	50-138			
2-Chloronaphthalene	4.84	0.100 µg/L	4.76		102	50-139			
Chrysene	4.93	0.050 µg/L	4.44		111	59-140			
Dibenz(a,h)anthracene	4.37	0.010 µg/L	4.44		98	53-136			
Fluoranthene	4.75	0.030 µg/L	4.44		107	67-135			
Fluorene	4.44	0.050 µg/L	4.44		100	57-134			
Indeno(1,2,3-cd)pyrene	4.68	0.050 µg/L	4.44		105	52-129			
1-Methylnaphthalene	4.44	0.100 µg/L	4.44		100	50-140			
2-Methylnaphthalene	4.46	0.100 µg/L	4.44		100	50-140			
Naphthalene	4.54	0.200 µg/L	4.44		102	50-140			
Phenanthrene	4.87	0.100 µg/L	4.44		110	61-134			
Pyrene	4.75	0.020 µg/L	4.44		107	66-131			
Quinoline	3.46	0.050 µg/L	4.31		80	50-140			
Surrogate: Acridine-d9	3.71	µg/L	4.47		83	50-140			
Surrogate: Naphthalene-d8	4.29	µg/L	4.47		96	50-140			
Surrogate: Perylene-d12	4.25	µg/L	4.47		95	50-140			
LCS Dup (B0B0437-BSD1)					Prepared: 2020-02-06, Analyzed: 2020-02-06				
Acenaphthene	4.24	0.050 µg/L	4.44		96	55-137	6	18	
Acenaphthylene	4.39	0.200 µg/L	4.44		99	53-140	5	20	
Acridine	3.42	0.050 µg/L	4.24		81	50-120	6	30	
Anthracene	4.17	0.010 µg/L	4.44		94	64-130	5	15	
Benz(a)anthracene	4.66	0.010 µg/L	4.44		105	57-140	4	25	

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Newell Regional Services Corporation
Winter Analysis 2019

WORK ORDER REPORTED 0020105
2020-02-19 16:08

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Polycyclic Aromatic Hydrocarbons (PAH), Batch B0B0437, Continued									
LCS Dup (B0B0437-BSD1), Continued					Prepared: 2020-02-06, Analyzed: 2020-02-06				
Benzo(a)pyrene	4.37	0.010 µg/L	4.44		98	63-133	8	18	
Benzo(b+j)fluoranthene	8.86	0.050 µg/L	8.89		100	60-129	7	17	
Benzo(g,h,i)perylene	4.45	0.050 µg/L	4.44		100	52-139	9	22	
Benzo(k)fluoranthene	3.75	0.050 µg/L	4.44		84	50-138	8	26	
2-Chloronaphthalene	4.40	0.100 µg/L	4.76		93	50-139	9	23	
Chrysene	4.73	0.050 µg/L	4.44		106	59-140	4	23	
Dibenz(a,h)anthracene	3.96	0.010 µg/L	4.44		89	53-136	10	21	
Fluoranthene	4.42	0.030 µg/L	4.44		99	67-135	7	18	
Fluorene	4.20	0.050 µg/L	4.44		95	57-134	5	18	
Indeno(1,2,3-cd)pyrene	4.22	0.050 µg/L	4.44		95	52-129	10	21	
1-Methylnaphthalene	4.09	0.100 µg/L	4.44		92	50-140	8	20	
2-Methylnaphthalene	4.07	0.100 µg/L	4.44		92	50-140	9	21	
Naphthalene	4.21	0.200 µg/L	4.44		95	50-140	7	22	
Phenanthrene	4.62	0.100 µg/L	4.44		104	61-134	5	17	
Pyrene	4.42	0.020 µg/L	4.44		100	66-131	7	19	
Quinoline	3.48	0.050 µg/L	4.31		81	50-140	< 1	14	
Surrogate: Acridine-d9	3.50	µg/L	4.47		78	50-140			
Surrogate: Naphthalene-d8	4.00	µg/L	4.47		90	50-140			
Surrogate: Perylene-d12	3.90	µg/L	4.47		87	50-140			

Total Metals, Batch B0B0485

Blank (B0B0485-BLK1)					Prepared: 2020-02-06, Analyzed: 2020-02-06				
Mercury, total	< 0.000010	0.000010 mg/L							
Duplicate (B0B0485-DUP1)					Source: 0020105-01 Prepared: 2020-02-06, Analyzed: 2020-02-06				
Mercury, total	< 0.000010	0.000010 mg/L			< 0.000010			20	
Reference (B0B0485-SRM1)					Prepared: 2020-02-06, Analyzed: 2020-02-06				
Mercury, total	0.00518	0.000010 mg/L	0.00489		106	80-120			

Total Metals, Batch B0B0571

Blank (B0B0571-BLK1)					Prepared: 2020-02-07, Analyzed: 2020-02-08				
Aluminum, total	< 0.0050	0.0050 mg/L							
Antimony, total	< 0.00020	0.00020 mg/L							
Arsenic, total	< 0.00050	0.00050 mg/L							
Barium, total	< 0.0050	0.0050 mg/L							
Boron, total	< 0.0050	0.0050 mg/L							
Cadmium, total	< 0.000010	0.000010 mg/L							
Calcium, total	< 0.20	0.20 mg/L							
Chromium, total	< 0.00050	0.00050 mg/L							
Copper, total	< 0.00040	0.00040 mg/L							
Iron, total	< 0.010	0.010 mg/L							
Lead, total	< 0.00020	0.00020 mg/L							
Magnesium, total	< 0.010	0.010 mg/L							
Manganese, total	< 0.00020	0.00020 mg/L							
Potassium, total	< 0.10	0.10 mg/L							
Selenium, total	< 0.00050	0.00050 mg/L							
Silver, total	< 0.000050	0.000050 mg/L							
Sodium, total	< 0.10	0.10 mg/L							
Uranium, total	< 0.000020	0.000020 mg/L							
Zinc, total	< 0.0040	0.0040 mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Newell Regional Services Corporation
Winter Analysis 2019

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2020-02-19 16:08

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B0B0571, Continued									
LCS (B0B0571-BS1)					Prepared: 2020-02-07, Analyzed: 2020-02-08				
Aluminum, total	0.0214	0.0050 mg/L	0.0199		108	80-120			
Antimony, total	0.0219	0.00020 mg/L	0.0200		109	80-120			
Arsenic, total	0.0214	0.00050 mg/L	0.0200		107	80-120			
Barium, total	0.0204	0.0050 mg/L	0.0198		103	80-120			
Boron, total	0.0210	0.0050 mg/L	0.0200		105	80-120			
Cadmium, total	0.0209	0.000010 mg/L	0.0199		105	80-120			
Calcium, total	2.13	0.20 mg/L	2.02		105	80-120			
Chromium, total	0.0221	0.00050 mg/L	0.0198		112	80-120			
Copper, total	0.0226	0.00040 mg/L	0.0200		113	80-120			
Iron, total	2.08	0.010 mg/L	2.02		103	80-120			
Lead, total	0.0223	0.00020 mg/L	0.0199		112	80-120			
Magnesium, total	2.21	0.010 mg/L	2.02		109	80-120			
Manganese, total	0.0210	0.00020 mg/L	0.0199		105	80-120			
Potassium, total	2.14	0.10 mg/L	2.02		106	80-120			
Selenium, total	0.0197	0.00050 mg/L	0.0200		98	80-120			
Silver, total	0.0205	0.000050 mg/L	0.0200		102	80-120			
Sodium, total	2.17	0.10 mg/L	2.02		107	80-120			
Uranium, total	0.0219	0.000020 mg/L	0.0200		109	80-120			
Zinc, total	0.0226	0.0040 mg/L	0.0200		113	80-120			

Reference (B0B0571-SRM1)					Prepared: 2020-02-07, Analyzed: 2020-02-08				
Aluminum, total	0.301	0.0050 mg/L	0.303		99	82-114			
Antimony, total	0.0548	0.00020 mg/L	0.0511		107	88-115			
Arsenic, total	0.125	0.00050 mg/L	0.118		106	88-111			
Barium, total	0.802	0.0050 mg/L	0.823		97	83-110			
Boron, total	3.22	0.0050 mg/L	3.45		93	80-118			
Cadmium, total	0.0501	0.000010 mg/L	0.0495		101	90-110			
Calcium, total	11.1	0.20 mg/L	11.6		96	85-113			
Chromium, total	0.273	0.00050 mg/L	0.250		109	88-111			
Copper, total	0.546	0.00040 mg/L	0.486		112	90-117			
Iron, total	0.511	0.010 mg/L	0.488		105	90-116			
Lead, total	0.216	0.00020 mg/L	0.204		106	90-110			
Magnesium, total	3.98	0.010 mg/L	3.79		105	88-116			
Manganese, total	0.110	0.00020 mg/L	0.109		101	88-108			
Potassium, total	7.37	0.10 mg/L	7.21		102	87-116			
Selenium, total	0.119	0.00050 mg/L	0.121		99	90-122			
Sodium, total	7.68	0.10 mg/L	7.54		102	86-118			
Uranium, total	0.0312	0.000020 mg/L	0.0306		102	88-112			
Zinc, total	2.75	0.0040 mg/L	2.49		110	90-113			

Volatile Organic Compounds (VOC), Batch B0B0551

Blank (B0B0551-BLK1)					Prepared: 2020-02-07, Analyzed: 2020-02-07				
Benzene	< 0.5	0.5 µg/L							
Bromodichloromethane	< 1.0	1.0 µg/L							
Bromoform	< 1.0	1.0 µg/L							
Carbon tetrachloride	< 0.5	0.5 µg/L							
Chlorobenzene	< 1.0	1.0 µg/L							
Chloroethane	< 2.0	2.0 µg/L							
Chloroform	< 1.0	1.0 µg/L							
Dibromochloromethane	< 1.0	1.0 µg/L							
1,2-Dibromoethane	< 0.3	0.3 µg/L							
Dibromomethane	< 1.0	1.0 µg/L							
1,2-Dichlorobenzene	< 0.5	0.5 µg/L							
1,3-Dichlorobenzene	< 1.0	1.0 µg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Newell Regional Services Corporation
Winter Analysis 2019

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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Volatile Organic Compounds (VOC), Batch B0B0551, Continued									
Blank (B0B0551-BLK1), Continued					Prepared: 2020-02-07, Analyzed: 2020-02-07				
1,4-Dichlorobenzene	< 1.0	1.0 µg/L							
1,1-Dichloroethane	< 1.0	1.0 µg/L							
1,2-Dichloroethane	< 1.0	1.0 µg/L							
1,1-Dichloroethylene	< 1.0	1.0 µg/L							
cis-1,2-Dichloroethylene	< 1.0	1.0 µg/L							
trans-1,2-Dichloroethylene	< 1.0	1.0 µg/L							
Dichloromethane	< 3.0	3.0 µg/L							
1,2-Dichloropropane	< 1.0	1.0 µg/L							
1,3-Dichloropropene (cis + trans)	< 1.0	1.0 µg/L							
Ethylbenzene	< 1.0	1.0 µg/L							
Methyl tert-butyl ether	< 1.0	1.0 µg/L							
Styrene	< 1.0	1.0 µg/L							
1,1,2,2-Tetrachloroethane	< 0.5	0.5 µg/L							
Tetrachloroethylene	< 1.0	1.0 µg/L							
Toluene	< 1.0	1.0 µg/L							
1,1,1-Trichloroethane	< 1.0	1.0 µg/L							
1,1,2-Trichloroethane	< 1.0	1.0 µg/L							
Trichloroethylene	< 1.0	1.0 µg/L							
Trichlorofluoromethane	< 1.0	1.0 µg/L							
Vinyl chloride	< 1.0	1.0 µg/L							
Xylenes (total)	< 2.0	2.0 µg/L							
Surrogate: Toluene-d8	27.2	µg/L	26.5		103	70-130			
Surrogate: 4-Bromofluorobenzene	18.3	µg/L	25.0		73	70-130			
Surrogate: 1,4-Dichlorobenzene-d4	16.1	µg/L	25.0		64	70-130			S02
LCS (B0B0551-BS1)					Prepared: 2020-02-07, Analyzed: 2020-02-07				
Benzene	15.3	0.5 µg/L	20.0		77	70-130			
Bromodichloromethane	19.0	1.0 µg/L	20.1		95	70-130			
Bromoform	19.8	1.0 µg/L	20.1		99	70-130			
Carbon tetrachloride	14.6	0.5 µg/L	20.2		72	70-130			
Chlorobenzene	18.1	1.0 µg/L	20.1		90	70-130			
Chloroethane	9.9	2.0 µg/L	20.0		50	60-140			SPK
Chloroform	19.0	1.0 µg/L	20.1		95	70-130			
Dibromochloromethane	19.2	1.0 µg/L	20.2		95	70-130			
1,2-Dibromoethane	17.7	0.3 µg/L	20.0		88	70-130			
Dibromomethane	18.7	1.0 µg/L	20.0		93	70-130			
1,2-Dichlorobenzene	19.8	0.5 µg/L	20.1		99	70-130			
1,3-Dichlorobenzene	21.2	1.0 µg/L	20.1		106	70-130			
1,4-Dichlorobenzene	23.6	1.0 µg/L	20.1		117	70-130			
1,1-Dichloroethane	16.6	1.0 µg/L	20.1		83	70-130			
1,2-Dichloroethane	18.2	1.0 µg/L	20.1		90	70-130			
1,1-Dichloroethylene	11.3	1.0 µg/L	20.0		57	70-130			SPK
cis-1,2-Dichloroethylene	16.7	1.0 µg/L	20.0		83	70-130			
trans-1,2-Dichloroethylene	14.8	1.0 µg/L	20.0		74	70-130			
Dichloromethane	16.4	3.0 µg/L	20.1		81	70-130			
1,2-Dichloropropane	17.8	1.0 µg/L	20.1		88	70-130			
1,3-Dichloropropene (cis + trans)	37.1	1.0 µg/L	40.0		93	70-130			
Ethylbenzene	14.6	1.0 µg/L	20.0		73	70-130			
Methyl tert-butyl ether	16.8	1.0 µg/L	20.0		84	70-130			
Styrene	15.2	1.0 µg/L	20.0		76	70-130			
1,1,2,2-Tetrachloroethane	19.9	0.5 µg/L	20.1		99	70-130			
Tetrachloroethylene	17.9	1.0 µg/L	20.1		89	70-130			
Toluene	18.8	1.0 µg/L	20.0		94	70-130			
1,1,1-Trichloroethane	14.6	1.0 µg/L	20.0		73	70-130			
1,1,2-Trichloroethane	19.1	1.0 µg/L	20.1		95	70-130			
Trichloroethylene	19.0	1.0 µg/L	20.1		95	70-130			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Newell Regional Services Corporation
Winter Analysis 2019

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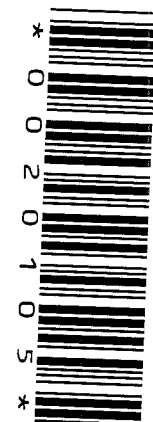
Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Volatile Organic Compounds (VOC), Batch B0B0551, Continued									
LCS (B0B0551-BS1), Continued					Prepared: 2020-02-07, Analyzed: 2020-02-07				
Trichlorofluoromethane	11.8	1.0 µg/L	20.0		59	60-140			SPK1
Vinyl chloride	7.6	1.0 µg/L	20.0		38	60-140			SPK
Xylenes (total)	46.0	2.0 µg/L	60.0		77	70-130			
Surrogate: Toluene-d8	23.4	µg/L	26.5		88	70-130			
Surrogate: 4-Bromofluorobenzene	24.7	µg/L	25.0		99	70-130			
Surrogate: 1,4-Dichlorobenzene-d4	26.4	µg/L	25.0		106	70-130			

QC Qualifiers:

RPD Relative percent difference (RPD) of duplicate analysis are outside of control limits for unknown reason(s).
 S02 Surrogate recovery outside of control limits. Data accepted based on acceptable recovery of other surrogates.
 S09 The surrogate recovery for this sample is outside of established control limits .
 SPK The recovery of this analyte was outside of established control limits.
 SPK1 The recovery of this analyte was outside of established control limits. The data was accepted based on performance of other batch QC.



Ca



888-311-8846

Clear Form Print a Copy Save a Copy CARO Website CARO AB COC, Rev 2017-05

CHAIN OF CUSTODY RECORD

COC#

PAGE OF

REPORT TO:

COMPANY: Newell Regional Services Corp.

ADDRESS: 330 Canal St E Brooks, AB

Tie/B*

CONTACT: Ryan Melrose

TEL/FAX: 403-793-3177

DELIVERY METHOD: EMAIL ☒ MAIL ☐ OTHER* ☐DATA FORMAT: EXCEL ☐ WATERTRAX ☒ ESdat ☐

EMAIL 1: r.melrose@nrsc.ca

EMAIL 2: k.steinley@nrsc.ca

EMAIL 3: #

INVOICE TO:

COMPANY:

ADDRESS:

CONTACT:

TEL/FAX:

DELIVERY METHOD: EMAIL ☒ MAIL ☐ OTHER* ☐

EMAIL 1: tdrake@nrsc.ca

EMAIL 2:

EMAIL 3:

PO #:

3565

* If you would like to sign up for ClientConnect and/or EnviroChain, CARO's online service offerings, please check here: ☐

SAMPLED BY:

CLIENT SAMPLE ID:

HeadeR# / WTD Analysis

MATRIX: DRINKING WATER ☐ OTHER WATER ☐ SOIL ☐ OTHER ☐

CONTAINER QTY

DATE YYYY-MM-DD

TIME HH:MM

CHLORINATED ☐ FILTERED ☐ PRESERVED ☐

(e.g. flow/volume media ID/notes)

1721A-1

SAME AS REPORT TO ☒chmond, BC V6V 2K9
Kelowna, BC V1X 5C3
Imonton, AB T5S 1H7

RELINQUISHED BY:

DATE:

TIME:

RECEIVED BY:

DATE:

TIME:

TURNAROUND TIME REQUESTED:

Routine: (5-7 Days) ☒
Rush: 1 Day* ☐ 2 Day* ☐ 3 Day* ☐Other* ☐

*Contact Lab To Confirm. Surcharge May Apply

PROJECT NUMBER / INFO:

REGULATORY APPLICATION:

Canadian Drinking Water Quality ☐
AB T1 SOIL/GW: NA ☐ AG ☐ RES/PL ☐ CL ☐ IL ☐AB SWQG: FWAL ☐ IW ☐ LW ☐

Other:

A: Biohazard B: Cyanide C: PCBs D: Asbestos E: Heavy Metals F: Flammable G: Strong Odour H: High Contamination I: Other (please specify*)

ANALYSES REQUESTED:

SOIL PHC F1-F4 BTEX ☐
WATER PHC F1-F2 BTEX ☐
VOC ☐ THM ☐ PAH ☐ HAA ☐
DISSOLVED METALS Hg ☐ Cr6 ☐
TOTAL METALS Hg ☐ Cr6 ☐
SOIL METALS SatP B ☐ Cr6 ☐ Hg ☐
SOIL SALINITY BASIC ☐ DETAILED ☐
CLASS 2 LANDFILL ☐
ROUTINE WATER Fe+Mn ☐
COD ☐ BOD ☐ TOC ☐ DOC ☐
TSS ☐ TDS ☐ VSS ☐
AMMONIA ☐ TKN ☐ TP ☐
TO&G ☐ PHENOLICS ☐
TCOL ☐ E. Coli ☐ FCOL ☐ HPC ☐
TOXICITY TROUT ☐ DAPHNIA ☐
PSA HYDROMETER ☐ 75 um SIEVE ☐

See Attached Form

HOLD

POSSIBLE SAMPLE HAZARD CODE(S)

SHIPPING INSTRUCTIONS: Return Cooler(s) ☐

Supplies Needed:

SAMPLE RETENTION:

30 Days (default) ☐60 Days ☐ 90 Days ☐

Other (surcharges will apply):

* OTHER INSTRUCTIONS:

SAMPLE RECEIPT CONDITION:

COOLER 1 (°C): 49

COOLER 2 (°C):

COOLER 3 (°C):

CUSTODY SEALS (N/A): NA

ICE: Y ☐ N ☐ICE: Y ☐ N ☐ICE: Y ☐ N ☐ICE: Y ☐ N ☐



NEWELL
REGIONAL SERVICES CORP.

Newell Regional Service Corporation: Lab Parameters

Summer and Winter Sampling Analysis (WTP)

Substance	Specific Parameter
Physical Parameters (primary and secondary)	Colour
	pH
	Total Dissolved Solids
	True Colour
	Turbidity
	Electrical Conductivity
Inorganic Chemicals (Primary)	Antimony
	Arsenic
	Barium
	Boron
	Bromate
	Cadmium
	Chloramines
	Chlorate
	Chlorite
	Chromium
	Cyanide
	Fluoride
	Lead
	Mercury
	Nitrate
	Nitrite
	Phosphate
	Selenium
	Uranium
Inorganic and Organic Chemicals (Secondary)	Aluminum
	Ammonia
	Alkalinity (total and Phenolphthalein) HCO ₃ , CO ₃ , OH
	Calcium
	Chloride
	Copper
	Total Hardness
	Iron
	Magnesium
	Manganese
	Potassium
	Silver
	Sodium
	Sulphate
	Sulphide
	Total Organic Carbon
	Xylenes (total)
	Zinc

Substance	Specific Parameter
Organic Chemicals, Pesticides and Herbicides (Primary)	Atrazine + metabolites
	Benzene
	Benzo(a)pyrene
	Bromoxynil
	Carbon Tetrachloride
	Chlorpyrifos
	Cyanazine
	Cyanobacterial toxins (as Total Microcystin)
	Diazinon
	Dicamba
	1,2-Dichlorobenzene
	1,4-Dichlorobenzene
	1,2-Dichloroethane
	Dichloromethane
	2,4-Dichlorophenol
	2,4-D
	Diclofop-methyl
	Diuron
	Dimethoate
	Ethylbenzene
	Glyphosate
	<u>Haloacetic Acid</u>
	Malathion
	<u>MCPA</u>
	Methoxychlor
	Metolachlor
	Metribuzin
	Monochlorobenzene
	<u>N-Nitrosodimethylamine (NDMA)</u>
	<u>Nitrilotriacetic Acid (NTA)</u>
	Pentachlorophenol
	Picloram
	Simazine
	Terbufos
	Tetrachloroethylene
	2,3,4,6-Tetrachlorophenol
	Toluene
	Trichloroethylene
	2,4,6- Trichlorophenol as
	Trifluralin and
	Vinyl Chloride
	Xylenes