



Aquatera Utilities Inc.
ATTN: Ashley Rowney
11101 104 Ave
Grande Prairie AB T8V 8H6

Date Received: 06-JAN-21
Report Date: 22-JAN-21 13:08 (MT)
Version: FINAL

Client Phone: 780-538-0348

Certificate of Analysis

Lab Work Order #: L2545889
Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers: CUSTOM, CUSTOM1, CUSTOM2
Legal Site Desc:

Wanda Chapella, B.A. Env.
Supervisor

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ADDRESS: 9505-111 Street, Grande Prairie, AB T8V 5W1 Canada | Phone: +1 780 539 5196 | Fax: +1 780 513 2191
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ANALYTICAL REPORT

Field Tests (WATER)

				ALS ID	L2545889-1
				Sampled Date	06-JAN-21
				Sampled Time	09:30
				Sample ID	
Analyte	Unit	Guide Limit #1	Guide Limit #2	TREATED WATER ENTERING THE DISTRIBUTION	
Total Chloramines (as Cl ₂)	mg/L	-	-	<0.32	

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2021)

#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)

#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Physical Tests (WATER)

				ALS ID	L2545889-1
				Sampled Date	06-JAN-21
				Sampled Time	09:30
				Sample ID	
Analyte	Unit	Guide Limit #1	Guide Limit #2	TREATED WATER ENTERING THE DISTRIBUTION	
Color, True	C.U.	-	-	<2.0	
Total Dissolved Solids	mg/L	500	-	193 <small>DLHC</small>	

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ANALYTICAL REPORT

Anions and Nutrients (WATER)

		ALS ID		L2545889-1
		Sampled Date		06-JAN-21
		Sampled Time		09:30
		Sample ID		TREATED WATER ENTERING THE DISTRIBUTION
Analyte	Unit	Guide Limit #1	Guide Limit #2	
Alkalinity, Total (as CaCO3)	mg/L	-	-	161
Ammonia, Total (as N)	mg/L	-	-	<0.050
Bicarbonate (HCO3)	mg/L	-	-	196
Bromate	ug/L	-	10	<0.30
Carbonate (CO3)	mg/L	-	-	<5.0
Chlorate	mg/L	-	1	<0.050 ^{SP}
Chloride (Cl)	mg/L	250	-	10.1
Chlorite	mg/L	-	1	<0.050 ^{SP}
Conductivity (EC)	uS/cm	-	-	389
Fluoride (F)	mg/L	-	1.5	0.719
Hardness (as CaCO3)	mg/L	-	-	198
Hydroxide (OH)	mg/L	-	-	<5.0
Ion Balance	%	-	-	96.6
Nitrate and Nitrite (as N)	mg/L	-	10	0.072
Nitrate (as N)	mg/L	-	10	0.072
Nitrite (as N)	mg/L	-	1	<0.010
pH	pH	7.00-10.5	-	7.72
TDS (Calculated)	mg/L	500	-	230
Sulfate (SO4)	mg/L	500	-	43.9
Sulphide (as S)	mg/L	-	-	<0.0015

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Cyanides (WATER)

		ALS ID		L2545889-1
		Sampled Date		06-JAN-21
		Sampled Time		09:30
		Sample ID		TREATED WATER ENTERING THE DISTRIBUTION
Analyte	Unit	Guide Limit #1	Guide Limit #2	
Cyanide, Total	mg/L	-	0.2	<0.0020

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Organic / Inorganic Carbon (WATER)

		ALS ID		L2545889-1
		Sampled Date		06-JAN-21
		Sampled Time		09:30
		Sample ID		TREATED WATER ENTERING THE DISTRIBUTION
Analyte	Unit	Guide Limit #1	Guide Limit #2	
Total Organic Carbon	mg/L	-	-	2.2

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ANALYTICAL REPORT

Inorganic Parameters (WATER)

		ALS ID		L2545889-1
		Sampled Date		06-JAN-21
		Sampled Time		09:30
		Sample ID		
Analyte	Unit	Guide Limit #1	Guide Limit #2	TREATED WATER ENTERING THE DISTRIBUTION
Chlorine, Free	mg/L	-	-	0.95
Chlorine, Total	mg/L	-	-	1.27

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Taxonomy (WATER)

		ALS ID		L2545889-1
		Sampled Date		06-JAN-21
		Sampled Time		09:30
		Sample ID		
Analyte	Unit	Guide Limit #1	Guide Limit #2	TREATED WATER ENTERING THE DISTRIBUTION
Total cyanobacterial cell count	cells/mL	-	-	<1

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2021)

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Total Metals (WATER)

		ALS ID		L2545889-1
		Sampled Date		06-JAN-21
		Sampled Time		09:30
		Sample ID		
Analyte	Unit	Guide Limit #1	Guide Limit #2	TREATED WATER ENTERING THE DISTRIBUTION
Aluminum (Al)-Total	mg/L	0.1	-	0.0498
Antimony (Sb)-Total	mg/L	-	0.006	<0.00010
Arsenic (As)-Total	mg/L	-	0.01	0.00011
Barium (Ba)-Total	mg/L	-	2	0.0977
Boron (B)-Total	mg/L	-	5	<0.010
Cadmium (Cd)-Total	mg/L	-	0.005	<0.0000050
Calcium (Ca)-Total	mg/L	-	-	56.2
Chromium (Cr)-Total	mg/L	-	0.05	<0.00010
Copper (Cu)-Total	mg/L	1	2	0.00060
Iron (Fe)-Total	mg/L	0.3	-	<0.010
Lead (Pb)-Total	mg/L	-	0.005	<0.000050
Magnesium (Mg)-Total	mg/L	-	-	13.9
Manganese (Mn)-Total	mg/L	0.02	0.12	0.00046
Mercury (Hg)-Total	mg/L	-	0.001	<0.0000050
Selenium (Se)-Total	mg/L	-	0.05	0.000433
Silver (Ag)-Total	mg/L	-	-	<0.000010
Sodium (Na)-Total	mg/L	200	-	7.74
Strontium (Sr)-Total	mg/L	-	7	0.254
Uranium (U)-Total	mg/L	-	0.02	0.000286
Zinc (Zn)-Total	mg/L	5	-	<0.0030

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ANALYTICAL REPORT

Volatile Organic Compounds (WATER)

		ALS ID		L2545889-1
		Sampled Date		06-JAN-21
		Sampled Time		09:30
		Sample ID		
Analyte	Unit	Guide Limit #1	Guide Limit #2	TREATED WATER ENTERING THE DISTRIBUTION
Benzene	mg/L	-	0.005	<0.0010
Carbon tetrachloride	mg/L	-	0.005	<0.0010
Chlorobenzene	mg/L	0.03	0.08	<0.0010
1,2-Dichlorobenzene	mg/L	0.003	0.2	<0.0010
1,4-Dichlorobenzene	mg/L	0.001	0.005	<0.0010
1,2-Dichloroethane	mg/L	-	0.005	<0.0020
1,1-Dichloroethene	mg/L	-	0.014	<0.0010
Methylene chloride	mg/L	-	0.05	<0.0010
Ethylbenzene	mg/L	0.0016	0.14	<0.0010
Methyl-t-butyl ether	mg/L	0.015	-	<0.00050
Tetrachloroethylene	mg/L	-	0.01	<0.0010
Toluene	mg/L	0.024	0.06	<0.0010
Trichloroethene	mg/L	-	0.005	<0.0010
Vinyl chloride	mg/L	-	0.002	<0.0020
o-Xylene	mg/L	-	-	<0.0010
m+p-Xylenes	mg/L	-	-	<0.0010
Xylenes (Total)	mg/L	0.02	0.09	<0.0014
Surrogate: 4-Bromofluorobenzene	%	-	-	77.8
Surrogate: 4-Bromofluorobenzene (SS)	%	-	-	80.0
Surrogate: 3,4-Dichlorotoluene	%	-	-	104.3
Surrogate: 3,4-Dichlorotoluene (SS)	%	-	-	91.0
Surrogate: 1,4-Difluorobenzene	%	-	-	100.6
Surrogate: 1,4-Difluorobenzene (SS)	%	-	-	100.0

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Polycyclic Aromatic Hydrocarbons (WATER)

		ALS ID		L2545889-1
		Sampled Date		06-JAN-21
		Sampled Time		09:30
		Sample ID		
Analyte	Unit	Guide Limit #1	Guide Limit #2	TREATED WATER ENTERING THE DISTRIBUTION
Benzo(a)pyrene	ug/L	-	0.04	<0.0050
Surrogate: d14-Terphenyl	%	-	-	91.3

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Haloacetic Acids (WATER)

		ALS ID		L2545889-1
		Sampled Date		06-JAN-21
		Sampled Time		09:30
		Sample ID		
Analyte	Unit	Guide Limit #1	Guide Limit #2	TREATED WATER ENTERING THE DISTRIBUTION
Dibromoacetic Acid	ug/L	-	-	<1.0
Dichloroacetic Acid	ug/L	-	-	3.9
Total Haloacetic Acids 5	ug/L	-	80	8.8
Bromoacetic Acid	ug/L	-	-	<1.0
Chloroacetic acid	ug/L	-	-	<1.0
Trichloroacetic Acid	ug/L	-	-	4.9

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Semi-Volatile Organics (WATER)

		ALS ID		L2545889-1
		Sampled Date		06-JAN-21
		Sampled Time		09:30
		Sample ID		
Analyte	Unit	Guide Limit #1	Guide Limit #2	TREATED WATER ENTERING THE DISTRIBUTION
N-Nitrosodimethylamine	ug/L	-	0.04	<0.00090
Surrogate: N-Nitrosodimethylamine-d6	%	-	-	64.0

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Perfluorinated Compounds (WATER)

		ALS ID		L2545889-1
		Sampled Date		06-JAN-21
		Sampled Time		09:30
		Sample ID		
Analyte	Unit	Guide Limit #1	Guide Limit #2	TREATED WATER ENTERING THE DISTRIBUTION
Perfluorooctane sulfonic acid (PFOS)	ug/L	-	0.6	<0.010
Perfluorooctanoic acid (PFOA)	ug/L	-	0.2	<0.010

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ANALYTICAL REPORT

Organochlorine Pesticides (WATER)

		ALS ID		L2545889-1
		Sampled Date		06-JAN-21
		Sampled Time		09:30
		Sample ID		
Analyte	Unit	Guide Limit #1	Guide Limit #2	TREATED WATER ENTERING THE DISTRIBUTION
a-chlordane	ug/L	-	-	<0.10
g-chlordane	ug/L	-	-	<0.10
pp-DDD	ug/L	-	-	<0.10
pp-DDE	ug/L	-	-	<0.10
op-DDT	ug/L	-	-	<0.10
pp-DDT	ug/L	-	-	<0.10
Oxychlordane	ug/L	-	-	<0.10
Surrogate: 2-Fluorobiphenyl	%	-	-	68.5
Surrogate: d14-Terphenyl	%	-	-	64.0

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2021)

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Herbicides (WATER)

		ALS ID		L2545889-1
		Sampled Date		06-JAN-21
		Sampled Time		09:30
		Sample ID		
Analyte	Unit	Guide Limit #1	Guide Limit #2	TREATED WATER ENTERING THE DISTRIBUTION
Bromoxynil	ug/L	-	30	<0.50
2,4-D	ug/L	-	100	<10
Dicamba	ug/L	-	120	<12
Dinoseb	ug/L	-	-	<1.0
Glyphosate	ug/L	-	280	<5.0
MCPA	ug/L	-	100	<0.50
Picloram	ug/L	-	190	<19
2,4,5-T	ug/L	-	-	<28
Surrogate: 2,4-Dichlorophenylacetic Acid	%	-	-	103.0

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Carbamate Pesticides (WATER)

		ALS ID		L2545889-1
		Sampled Date		06-JAN-21
		Sampled Time		09:30
		Sample ID		
Analyte	Unit	Guide Limit #1	Guide Limit #2	TREATED WATER ENTERING THE DISTRIBUTION
Aldicarb	ug/L	-	-	<0.90 ^{SRU}

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ANALYTICAL REPORT

Pesticides (WATER)

		ALS ID		L2545889-1
		Sampled Date		06-JAN-21
		Sampled Time		09:30
		Sample ID		TREATED WATER ENTERING THE DISTRIBUTION
Analyte	Unit	Guide Limit #1	Guide Limit #2	
Alachlor	ug/L	-	-	<0.10
Ametryn	ug/L	-	-	<0.10
Atrazine	ug/L	-	-	<0.10
Atrazine+N-Dealkylated Metabolites	ug/L	-	5	<0.20
Azinphos-methyl	ug/L	-	20	<0.10
Bendiocarb	ug/L	-	-	<0.50
Carbaryl	ug/L	-	90	<0.50
Carbofuran	ug/L	-	90	<0.50
Chlorpyrifos	ug/L	-	90	<0.10
Cyanazine	ug/L	-	-	<0.10
Diazinon	ug/L	-	20	<0.10
2,4-Dichlorophenol	ug/L	0.3	900	<0.30
Dimethoate	ug/L	-	20	<0.10
Diquat	ug/L	-	70	<1.0 SRU
Diuron	ug/L	-	150	<1.0 SRU
Atrazine Desethyl	ug/L	-	-	<0.10
Parathion	ug/L	-	-	<0.10
Malathion	ug/L	-	190	<0.10
Diclofop-methyl	ug/L	-	9	<0.10
Methyl Parathion	ug/L	-	-	<0.10
Metolachlor	ug/L	-	50	<0.10
Metribuzin	ug/L	-	80	<1.0
Paraquat	ug/L	-	7	<1.0 SRU
Pentachlorophenol	ug/L	30	60	<6.0
Phorate	ug/L	-	2	<0.10
Prometon	ug/L	-	-	<0.10
Prometryne	ug/L	-	-	<0.10
Propazine	ug/L	-	-	<0.10
Simazine	ug/L	-	10	<0.10
Temphos	ug/L	-	-	<1.0
Terbufos	ug/L	-	1	<0.10
Terbutryn	ug/L	-	-	<0.10
2,3,4,6-Tetrachlorophenol	ug/L	1	100	<1.0

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Pesticides (WATER)

		ALS ID		L2545889-1
		Sampled Date		06-JAN-21
		Sampled Time		09:30
		Sample ID		
Analyte	Unit	Guide Limit #1	Guide Limit #2	TREATED WATER ENTERING THE DISTRIBUTION
Triallate	ug/L	-	-	<0.10
2,4,6-Trichlorophenol	ug/L	2	5	<0.50
Trifluralin	ug/L	-	45	<0.10
Surrogate: 2-Fluorobiphenyl	%	-	-	85.6
Surrogate: d14-Terphenyl	%	-	-	104.5
Surrogate: 2,4,6-Tribromophenol	%	-	-	75.6

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Organic Parameters (WATER)

		ALS ID		L2545889-1
		Sampled Date		06-JAN-21
		Sampled Time		09:30
		Sample ID		
Analyte	Unit	Guide Limit #1	Guide Limit #2	TREATED WATER ENTERING THE DISTRIBUTION
Microcystin	ug/L	-	1.5	<0.20
Nitritotriacetic Acid (NTA)	mg/L	-	0.4	<0.20

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Miscellaneous (MISC.)

		ALS ID		L2545889-1
		Sampled Date		06-JAN-21
		Sampled Time		09:30
		Sample ID		
Analyte	Unit	Guide Limit #1	Guide Limit #2	TREATED WATER ENTERING THE DISTRIBUTION
Special Request	No Unit	-	-	See Attacher

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Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comment:
L2545889-1	Water	Note: No cyanobacteria observed.	

Qualifiers for Individual Parameters Listed:

Qualifier	Description
SP	Sample was Preserved at the laboratory
SRU	Sample Received Unpreserved. Results may be biased low for indicated parameter(s)
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
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ACIDS-ONT-DW-WT Water O.Reg 170/03 Acids SW846 8270

Pesticides are extracted from an aqueous sample using separate aliquots of solvent, extracts are concentrated down to a certain volume and analyzed on the GC/MSD.

ALDICARB-WT Water Aldicarb E3501

An aliquot of water sample is diluted 1:1 using acetonitrile and analyzed using LC/MS/MS

ALGAE-CYANO-BACT-WP Water Enumeration of blue green algae cells APHA 10200 C & F

Samples are prepared by sedimentation/settling and examined using a compound phase contrast inverted microscope. Cyanobacteria (also known as blue-green algae) are identified to genus and the cells are enumerated. The total cyanobacteria count is also reported.

BAP-WT Water Benzo(a)pyrene SW486 8270

Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS.

BROMATE-ONT-DW-WT Water Bromate in Water by LC/MS-MS EPA 6850

An aliquot of sample is spiked with 18O-BrO3 internal standard and analyzed by LC/MS/MS.

This test procedure does not incorporate EDA preservation for bromate. Unpreserved bromate in water is stable for at least the 28 day recommended hold time, but samples that contain free chlorine or ozone could form additional bromate after the time of sampling (EPA 300.0 and 300.1).

C-TOT-ORG-CL Water Total Organic Carbon APHA 5310 B-Instrumental

Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.

CHLORAMINES-CALC-ED Water Total Chlorine minus Free Chlorine BC MOE Lab Manual(2009)

Total Chloramines, as Chlorine, is determined by calculation.

Total Chloramines (as Chlorine) = Total Chlorine - Free Chlorine. This calculation comes from the BCMOE lab manual (2009) "Total Residual Chlorine and Chloramines in water by DPD Colorimetric-PBM"

CHLORATE-IC-WT Water Chlorate by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

CHLORITE-IC-WT Water Chlorite by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

CL-IC-N-ED Water Chloride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

CL2-FREE-ED Water Chlorine, Free APHA 4500 Cl G-Colorimetry

Chlorine (residual), as free or total, is analyzed using the DPD colourimetric method. The recommended hold time for these tests is 15 minutes; field testing is recommended for best results. Chlorine can be rapidly consumed by organic matter, if present, and dissipates rapidly into headspace.

CL2-TOT-ED Water Chlorine, Total APHA 4500 Cl G-Colorimetry

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
Chlorine (residual), as free or total, is analyzed using the DPD colourimetric method. The recommended hold time for these tests is 15 minutes; field testing is recommended for best results. Chlorine can be rapidly consumed by organic matter, if present, and dissipates rapidly into headspace.			
CN-TOT-WT	Water	Cyanide, Total	ISO 14403-2
Total cyanide is determined by the combination of UV digestion and distillation. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.			
When using this method, high levels of thiocyanate in samples can cause false positives at ~1-2% of the thiocyanate concentration. For samples with detectable cyanide analyzed by this method, ALS recommends analysis for thiocyanate to check for this potential interference			
COL-TRU-ED	Water	Color, True	APHA 2120
True Colour is measured using a colorimeter 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.			
DIQUAT-ONT-DW-WT	Water	Diquat in Water by LC/MS-MS	E3503
An aliquot of the sample is taken and internal standard is added. The sample is analyzed by LC/MS/MS.			
DIURON-ONT-DW-WT	Water	Diuron in Drinking Water	E3501
An aliquot of water sample is diluted 1:1 using acetonitrile and analyzed using LC/MS/MS			
F-IC-N-ED	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
GLYPHOSATE-ONT-DW-WT	Water	Glyphosate in Drinking Water	MOE E3500
This analysis is carried out using procedures adapted from ON MOE E3500 "Glyphosate". Glyphosate is determined by direct injection by LC-MS/MS on a sample that has been derivatized.			
HAA-DW-LCMS-WT	Water	Haloacetic Acids - Ontario DW List	MOECC E3478
An aliquot of sample is fortified with formic acid and analyzed by direct inject via Electro Spray Ionization MS/MS detection using Triple Quadrupole MS/MS detector.			
HAA5-SUM-DW-CALC-WT	Water		CALCULATION
Total Haloacetic Acids 5 (HAA5) represents the sum of monobromoacetic acid, monochloroacetic acid, dibromoacetic acid, dichloroacetic acid and trichloroacetic acid. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.			
HG-T-CVAA-ED	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.			
IONBALANCE-ED	Water	Ion Balance Calculation	APHA 1030E
MET-T-CCMS-ED	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.			
MICROCYSTIN-WP	Water	Microcystin	ENVIROLOGIX QUANTIPLATE KIT CAT. EP022HS
Total Microcystins (intracellular and extracellular) in aqueous matrices is determined by the Enzyme-Linked Immunosorbent Assay (ELISA) method.			
MTBE-ADD-ED	Water	MTBE	EPA 5030/8021B-P&T GC-PID/FID
NH3-F-CL	Water	Ammonia by Fluorescence	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.			
NITROSAM-SPE-LCMS-WT	Water	Nitrosamines in water	QWI-ORG/WP239 and EPA 521
An aliquot of sample is solid phase extracted followed by liquid chromatography tandem mass spectrometry instead of direct injection.			
NO2+NO3-CALC-ED	Water	Nitrate+Nitrite	CALCULATION

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
NO2-IC-N-ED	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-N-ED	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NTA-WT	Water	Nitritotriacetic Acid (NTA)	EPA 430.1
NTA refers to the tri-sodium salt of nitritotriacetic acid, N(CH ₂ COONa) ₃ . Zinc forms a blue-coloured complex with 2 carboxy-2-hydroxy-5-sulfoformazylbenzene (Zincon) in a solution buffered to pH 9.2. When NTA is added to the sample, the Zinc-Zincon complex is broken which reduces the absorbance in proportion to the amount of NTA present. Samples are filtered with a 0.45 um membrane before analysis.			
OCPEST-ONT-DW-WT	Water	O.Reg 170/03 OC Pesticides	SW846 8270
Pesticides are extracted from an aqueous sample using separate aliquots of solvent, extracts are concentrated and analyzed on the GC/MSD.			
PARAQUAT-ONT-DW-WT	Water	Paraquat in Water by LC/MS-MS	E3503
An aliquot of the sample is taken and internal standard is added. The sample is analyzed by LC/MS/MS.			
PEST-MISC-WT	Water	Miscellaneous Pesticides	SW846 8270
Pesticides are extracted from an aqueous sample using separate aliquots of solvent, extracts are concentrated down to a certain volume and analyzed on the GC/MSD.			
PEST-PAHERB-LCMS-WT	Water	Phenoxyacid Herbicides by LC-MS/MS	MOE E3552
Water samples are subjected to 0.2 µM RC filtration and analyzed by direct injection without sample preparation using liquid chromatography tandem mass spectrometry (LC-MS/MS).			
PFAS-DI-LCMS-WT	Water	PFOA & PFOS by Direct Injection LC/MS-MS	MOECC E3533
An aliquot of water is analyzed for PFCs by direct injection LC/MS/MS			
PH/EC/ALK-ED	Water	pH, Conductivity and Total Alkalinity	APHA 4500-H, 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. Auto-titration to pH 4.5 using 0.02N H ₂ SO ₄ is performed. Conductivity measurement is based on the sample's capacity to convey an electric current, and is measured with a conductivity meter.			
SO4-IC-N-ED	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).			
SPECIAL REQUEST-BE	Misc.	Radionuclides Becquerel Labs	SEE SUBLET LAB RESULTS
SULPHIDE-CFA-ED	Water	Sulphide	APHA 4500 -S E-Auto-Colorimetry
A continuous flow manifold adds HCl to the sample which converts sulphide to a gas, then the sulphide is separated from the flow using a gas dialysis membrane. A colorimetric reaction produces a methylene blue compound which is measured at 660 nm. This follows the Standard Methods procedure 4500 S-E.			
VOC-EPA-ED	Water	EPA Volatile Organics	SW 846 8260-GC-MS
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. Target compound concentrations are measured using mass spectrometry detection			
XYLENES-SUM-CALC-ED	Water	Sum of Xylene Isomer Concentrations	CALCULATION

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

Chain of Custody Numbers:

CUSTOM CUSTOM1 CUSTOM2

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:

Reference Information

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
BE	BECQUEREL LABORATORIES INC. - MISSISSAUGA, ONTARIO, CANADA
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

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

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

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.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guideline limits are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.



Your P.O. #: L2545889
Your C.O.C. #: n/a

Attention: Wanda Chapella

ALS Laboratory Group
9505-111 Street
Grande Prairie, AB
Canada T8V 5W1

Report Date: 2021/01/22
Report #: R6490239
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C105011

Received: 2021/01/08, 13:12

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Artificial Isotope Group Analysis	1	N/A	2021/01/08	BQL SOP-00007	Gamma Spectrometry
Lead 210	1	N/A	2021/01/20	BQL SOP-00008	GFPC
Strontium-90 by Proportional Counting	1	N/A	2021/01/18	BQL SOP-00008	GFPC
Tritium by Liquid Scintillation Counting	1	N/A	2021/01/09	BQL SOP-00009	LSC

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.



Your P.O. #: L2545889
Your C.O.C. #: n/a

Attention: Wanda Chapella

ALS Laboratory Group
9505-111 Street
Grande Prairie, AB
Canada T8V 5W1

Report Date: 2021/01/22
Report #: R6490239
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C105011
Received: 2021/01/08, 13:12

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Mayank Nigam, Project Manager
Email: Mayank.Nigam@bureauveritas.com
Phone# (905) 826-3080

=====
This report has been generated and distributed using a secure automated process.
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BUREAU
VERITAS

BV Labs Job #: C105011
Report Date: 2021/01/22

ALS Laboratory Group
Your P.O. #: L2545889

RESULTS OF ANALYSES OF WATER

BV Labs ID		OOH396		
Sampling Date				
COC Number		n/a		
	UNITS	L2545889 - 1 TREATED WATER ENTERING THE DISTRIBUTION SYSTEM	RDL	QC Batch
Lead-210	Bq/L	<0.10	0.10	7147733
Strontium-90	Bq/L	<0.10	0.10	7144747
Tritium	Bq/L	<15	15	7142274
Cesium-137	Bq/L	<1	1	7141858
Iodine-131	Bq/L	<1	1	7141858
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				



**BUREAU
VERITAS**

BV Labs Job #: C105011
Report Date: 2021/01/22

ALS Laboratory Group
Your P.O. #: L2545889

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

BV Labs Job #: C105011
Report Date: 2021/01/22

ALS Laboratory Group
Your P.O. #: L2545889

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7141858	DS2	QC Standard	Cesium-137	2021/01/11		101	%	N/A
			Iodine-131	2021/01/11		95	%	N/A
7141858	DS2	Method Blank	Cesium-137	2021/01/12	<1		Bq/L	
			Iodine-131	2021/01/12	<1		Bq/L	
7141858	DS2	RPD [OOH396-02]	Cesium-137	2021/01/11	NC		%	N/A
			Iodine-131	2021/01/11	NC		%	N/A
7142274	DS2	Spiked Blank	Tritium	2021/01/08		99	%	92 - 108
7142274	DS2	Method Blank	Tritium	2021/01/09	<15		Bq/L	
7142274	DS2	RPD [OOH396-02]	Tritium	2021/01/09	NC		%	N/A
7144747	FK1	Spiked Blank	Strontium-90	2021/01/18		97	%	75 - 125
7144747	FK1	Method Blank	Strontium-90	2021/01/18	<0.10		Bq/L	
7144747	FK1	RPD [OOH396-01]	Strontium-90	2021/01/18	NC		%	N/A
7147733	JK2	Spiked Blank	Lead-210	2021/01/20		101	%	80 - 120
7147733	JK2	Method Blank	Lead-210	2021/01/20	<0.10		Bq/L	
7147733	JK2	RPD	Lead-210	2021/01/20	NC		%	N/A

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).



BUREAU
VERITAS

BV Labs Job #: C105011
Report Date: 2021/01/22

ALS Laboratory Group
Your P.O. #: L2545889

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

A handwritten signature in purple ink that reads "R. Allen".

Robert Allen, Scientific Specialist

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Municipal Drinking Water Facility Sample Request Form – Facility to Lab (Ver2009-01)
 (as per Alberta Environment Approval/Registration) (one sample per form)

LABORATORY INFORMATION:

Name:	ALS Laboratory		
Address:	9505-111 Street Grande Prairie, AB T8V 5W1		
Phone:	780 539 5196	FAX:	

Lab: Please email receipt of this sample to: dwg.datacoord@gov.ab.ca done, DATE:

FOR LAB USE:

Lab Sample Number:		Date Received:	
Account:			

BILLING / SAMPLE REQUESTER INFORMATION:

Contact Name:	Tamara Wuttunee-Campbell		
Mailing Address:	11101-104 Ave Grande Prairie, AB T8V 8H6		
Phone:	780 532 3996	FAX:	780 538 4554
E-mail:	twuttunee@aquatera.ca		

Send Report to: same as above OR

Name:	
Mailing Address:	



L2545889-COF

Send Invoice to: same as above OR

Name:	
Mailing Address:	

FACILITY WATER SAMPLING (Annual/Quarterly/Semi-annual/Monthly); Project Code: ABMDWQ

Facility Sample Identifier (Sample No.)		MUST match label on bottle(s)	Date Sent:
<small>Laboratory to fill out</small>			

Sample Date:	2021 / 01 / 06	Time:	09 : 30
<small>Operator to fill out</small>	<small>YYYY / MMM / DD</small>	<small>(24 hr clock)</small>	<small>HH : mm</small>

AENV Approval/Registration #	722		
Facility Name:	AQUATERA REGIONAL WATERWORKS SYSTEM		
Sampled at Station No.	AB07GE0604	Station Description:	Treated Water Entering the Distribution System
Sample Matrix:	Treated Water Entering the Distribution System (10)	Raw Water Source:	<input type="checkbox"/> Ground Water <input checked="" type="checkbox"/> Surface Water <input type="checkbox"/> Ground Water under Influence of Surface Water
Sample Type:	DISCRETE SAMPLE (GRAB) (1)		
Sample Frequency:	(2 SAMPLES PER ANNUM) (ANNUL)		
Sample Location / Comments:	Water Treatment Plant		
Send results to AENV electronically:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	

ANALYSIS TYPE: (check which is appropriate for this sample) see reverse for details.

<input checked="" type="checkbox"/> Physical	<input checked="" type="checkbox"/> Inorganic	<input checked="" type="checkbox"/> Organics & Pesticide
<input type="checkbox"/> TotalTrihalomethanes	<input type="checkbox"/> Fluoride Only	<input type="checkbox"/> Giardia / Cryptosporidium / Viruses
<input checked="" type="checkbox"/> Cynobacterial Toxin (as Microcystin)	<input checked="" type="checkbox"/> Other: Send in both COC Tests	

All Municipal Drinking Water Facilities, regulated by Alberta Environment, must have their annual, semi annual, and / or specific monthly samples analyzed at an ISO/IEC 17025 accredited laboratory. AENV will only accept data in their specific electronic format. Billing / payment is the responsibility of the facility. The above information must be submitted by the facility and recorded by the laboratory to insure that it is forwarded with the sample data.