WATER
List of Acronyms

E200.7	Inductively Coupled Plasma (ICP - Analytical Method)
E200.8	Inductively Coupled Plasma - Mass Spectrometry (ICP-MS - Analytical Method)
A	Standard Methods
ASTM	American Society for Testing & Materials
BOD	Biochemical Oxygen Demand
$CaCO_3$	Calcium Carbonate
CO_3	Carbonate
CFU	Colony Forming Units
COD	Chemical Oxygen Demand
DBCP	1, 2-Dibromo-3-chloropropane
DOC	Dissolved Organic Carbon
EDB	Dibromoethane
E or EPA	US Environmental Protection Agency
GC/FID	Gas Chromatograph/Flame Ionization Detector
H_2SO_4	Sulfuric Acid
HCl	Hydrochloric Acid
HCO_3	Bicarbonate
HNO_3	Nitric Acid
ICP	Inductively Coupled Plasma
ICP-MS	Inductively Coupled Plasma - Mass Spectrophotometer
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goals
MDL	Method Detection Limit
MPN	Most Probable Number
NaOH	Sodium Hydroxide
NPDES	National Pollutant Discharge Elimination System
NR	Not Regulated
NTU	Nephelometric Turbidity Units
OH	Hydroxide
PCBs	Polychlorinated Biphenyls
pCi/L	Picocuries per Liter
ppb	parts per billion
ppm	parts per million
PQLs	Practical Quantitation Limits If the sample is contaminated, it may require dilution prior to analysis. The PQL of diluted samples will be correspondingly higher.
PVC	Polyvinyl Chloride
SW	Solid Waste 846
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
TOC	Total Organic Carbon
TOX	Total Organic Halogens
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
VOA	Volatile Organic Analysis
VOCs	Volatile Organic Chemicals
VSS	Volatile Suspended Solids
WAD	Weak Acid Dissociable

The analytical methods listed above are typically referenced for drinking water and clean water regulations.

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METALS	METHOD	UNIT
Total Metals Digestion	E200.2	-
Filtering or preserving samples on receipt at the laboratory, as appropriate - per fraction		
Aluminum	E200.7/E200.8	mg/L
Antimony	E200.7/E200.8	mg/L
Arsenic	E200.7/E200.8/A3114C	mg/L
Arsenic, III & V speciation	E1632A Mod.	mg/L
Barium	E200.7/E200.8	mg/L
Beryllium	E200.7/E200.8	mg/L
Bismuth	E200.7/E200.8	mg/L
Boron	E200.7/E200.8	mg/L
Cadmium	E200.7/E200.8	mg/L
Calcium	E200.7/E200.8	mg/L
Chromium	E200.7/E200.8	mg/L
Chromium, Hexavalent (Cr+6)	A 3500 Cr B	mg/L
Cobalt	E200.7/E200.8	mg/L
Copper	E200.7/E200.8	mg/L
Gallium	E200.8	mg/L
Gold	E200.7/E200.8	mg/L
Iron	E200.7/E200.8	mg/L
Iron, Ferrous (Fe II)	E200.7/E200.8	mg/L
Iron, Ferrous (Fe II)	A3500FeB	mg/L
Iron, Ferric (Fe III)	Calculated from Iron and Iron, Ferrous	
Lead	E200.7/E200.8	mg/L
Lithium	E200.7/E200.8	mg/L
Magnesium	E200.7/E200.8	mg/L
Manganese	E200.7/E200.8	mg/L
Mercury	E200.8	mg/L
Mercury	E245.1/E245.7/SW7470	mg/L
Mercury, low level	E245.1/E245.7/E200.8/SW7470	mg/L
Low Level Metal (lower than the reporting limit indicated above) – per metal ***Please contact your Project Manager to discuss our low level capabilities***		

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METALS	METHOD	UNIT
Mercury, ultra low-level	E245.7	ng/L
For Ultra low-level mercury by method 245.7, both a trip blank and field blank are required for each set of samples. Both the trip blank and field blank will be analyzed and charged at $55 each.		
Molybdenum	E200.7/E200.8	mg/L
Nickel	E200.7/E200.8	mg/L
Potassium	E200.7/E200.8	mg/L
Rubidium	E200.8	mg/L
Selenium	E200.7/E200.8/A3114C	mg/L
Selenium, IV & VI speciation	A3114C Mod.	mg/L
Silicon	E200.7/E200.8	mg/L
Silver	E200.7/E200.8	mg/L
Sodium	E200.7/E200.8	mg/L
Strontium	E200.7/E200.8	mg/L
Tellurium	E200.7/E200.8	mg/L
Thallium	E200.7/E200.8	mg/L
Tin	E200.7/E200.8	mg/L
Titanium	E200.7/E200.8	mg/L
Tungsten	E200.7/E200.8	mg/L
Uranium	E200.7/E200.8	mg/L
Vanadium	E200.7/E200.8	mg/L
Zinc	E200.7/E200.8	mg/L
Zirconium	E200.7/E200.8	mg/L
Low Level Metal (lower than the reporting limit indicated above) – per metal ***Please contact your Project Manager to discuss our low level capabilities***		

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NON-METALS	METHOD	UNIT
Acidity, Total as $CaCO_3$	A2310B	mg/L
Alkalinity, total as $CaCO_3$, includes bicarbonate as HCO_3, Carbonate as CO_3, and hydroxide as OH	A2320B	mg/L
Ammonia (see Nitrogen, Ammonia)	-	-
Biochemical Oxygen Demand (BOD)	A5210B	mg/L
Biochemical Oxygen Demand, Carbonaceous	A5210B	mg/L
Bromate	E300.0/E300.1	mg/L
Bromide	E300.0	mg/L
Chemical Oxygen Demand (COD)	E410.4	mg/L
Chlorate	E300.0/E300.1	mg/L
Chloride	E300.0/A4500CL B	mg/L
Chlorite	E300.0/E300.1	mg/L
Chlorine, Residual	A4500CL2-G /E330.5 Mod.	mg/L
Chlorophyll a	A10200H	mg/m^3
Color	A2120B	Color Units
Conductance, Specific @ 25°C	A2510B	µmhos/cm
Corrosivity (Ca, Alkalinity, pH, TDS)	Calculation	-
Cyanates	A4500CN L	mg/L
Cyanide, Amenable to Chlorination	A4500CN G	mg/L
Cyanide, Free (Electrode)	A4500CN F/ Electrode Manufacturer	mg/L
Cyanide, Total	Kelada mod / E335.4	mg/L
Cyanide, Weak Acid Dissociable	ASTM D2036	mg/L
Cyanide, Thiocyanate as N	A4500CN M	mg/L
Ethylene Glycol	ASTM D2982 Mod.	P/A
Foaming Agents	A5540C or LaMotte DS-1	mg/L
Foaming Agents, low level	A5540C	mg/L
Fluoride	A4500F C	mg/L
Formaldehyde	NIOSH 3500 Mod.	mg/L

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NON-METALS, continued	**METHOD**	**UNIT**
Hardness, Total as $CaCO_3$	A2340 B	mg/L
Iodide	E300.0	mg/L
Methane, ethane, ethene	GC-FID/ Kampbell (SW 8015 Mod.)	mg/L
Nitrogen: Ammonia as N	E350.1	mg/L
Nitrogen: Nitrate plus Nitrite as N	E353.2	mg/L
Nitrogen: Nitrate as N	E353.2/E300.0	mg/L
Nitrogen: Nitrite as N	E353.2/E300.0	mg/L
Nitrogen: Total Kjeldahl as N	E351.2	mg/L
Nitrogen, Total	Total Nitrogen = Nitrate plus Nitrite as N + Total Kjeldahl Nitrogen	
Nitrogen, Total (persulfate -includes TKN, NO_3, and NO_2)	A4500N C	mg/L
Nitrogen, Organic	Organic Nitrogen = Total Kjeldahl Nitrogen - Ammonia Nitrogen	
Odor	A2150B	
Oil and Grease, IR	E418.1	mg/L
Oil & Grease, Gravimetric-Hexane extractable	E1664A / A5520 B	mg/L
Oil & Grease Sulfur corrected w/Copper	E1664-Cu	mg/L
Organic Carbon, Total (TOC)	SW9060	mg/L
Organic Carbon, Total (TOC), low level, public water	A5310C	mg/L
Organic Carbon, Dissolved (DOC)	A5310B/A5310C	mg/L
pH	E150.2/A4500H B	s.u.
Oxidation-Reduction Potential	A2580	mV
Phenolics, Total	E420.4	mg/L
Phosphorus, Hydrolyzable	E365.1	mg/L
Phosphorus, Ortho	E365.1	mg/L
Phosphorus, Total Organic	E365.1	mg/L
Phosphorus, Total	E365.1	mg/L

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NON-METALS, continued	**METHOD**	**UNIT**
Residue, Non-Filterable Total Suspended Solids (TSS)	A2540D	mg/L
Residue, Total	A2540B	mg/L
Residue, Total Filtered Total Dissolved Solids (TDS)	A2540C	mg/L
Residue, Volatile Volatile Suspended Solids (VSS) @ 550°	A2540E	mg/L
Residue, Settleable Matter	A2540F	mL/L
Resistivity	A2510B	ohm-meters
Silica	E200.7/E200.8	mg/L
Specific Gravity	D1429	unitless
Sulfate	E300.0/A4500SO4 E	mg/L
Sulfide, Iodine Titrimetric	A4500S F	mg/L
Sulfide, Methylene Blue Colorimetric	A4500S D	mg/L
Sulfite	A4500S B	mg/L
Surfactants (MBAS, Foaming Agents)	A5540C or LaMotte DS-1	mg/L
Surfactants, low level (MBAS, Foaming Agents)	A5540C	mg/L
Tannins and Lignins	A5550	mg/L
Total Petroleum Hydrocarbons	E418.1	mg/L
Total Organic Halogens (TOX)	SW9020B	mg/L
TPH, Gravimetric-Hexane extractable	E1664A / A5520B	mg/L
TPH, Sulfur corrected w/Copper	E1664-Cu	mg/L
Turbidity	A2130B	NTU

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RADIOCHEMISTRY	METHOD	UNIT
Gamma Emitting Radionuclides	E901.1	pCi/L
Gross Alpha Radioactivity Drinking water	E900.0	pCi/L
Gross Alpha Radioactivity	E900.0	pCi/L
Gross Beta Radioactivity Drinking water	E900.0	pCi/L
Gross Beta Radioactivity	E900.0	pCi/L
Gross Alpha and Beta Drinking water	E900.0	pCi/L
Gross Alpha and Beta	E900.0	pCi/L
Gross Radium Alpha (minus Radon & Uranium)	E900.1	pCi/L
^{210} Lead	E909.0	pCi/L
^{210} Polonium	E912.0	pCi/L
^{226} Radium (Alpha Emitting Isotopes)	E903.0	pCi/L
^{228} Radium	RA-05	pCi/L
^{222} Radon	ASTM D5072-92	pCi/L
Radioactive Strontium	E905.0	pCi/L
Isotopic Thorium (^{228}Th, ^{230}Th, ^{232}Th)	E908.0	pCi/L
^{230} Thorium	E908.0	pCi/L
Tritium	E906.0	pCi/L
Isotopic Uranium (^{234}U, ^{235}U, ^{238}U)	A7500U-C	pCi/L

For pricing and information on radiochemical analyses of drinking water, please refer to the *Radiochemstry* section: **RADIOCHEMICAL ANALYSES - Drinking Water**

NOTES:

(1) Some reporting limits are dependent on sample volume provided.

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BACTERIA	METHOD	UNIT
E. coli, quantitative	A9223B	MPN/100ml
E. coli, membrane filtration count	E1603	CFU/100mL
Fecal Coliforms, membrane filtration count	A9222D	CFU/100mL
Fecal Coliforms, sludge, membrane filtration count	A9222D	CFU/g
Fecal Coliforms, quantitative	Colilert-18	MPN/100mL
Fecal Coliforms, sludge	A9221E	MPN/g
Fecal Coliforms, water	A9221E	MPN/100mL
Total Coliforms/E.coli, present/absent	A9223B	P/A
Total Coliforms, present/absent (Pools & Spas)	A9221D	P/A
Total Coliforms/E.coli, quantitative	A9223B Colilert Quantitray	MPN/100mL
Total Coliforms, membrane filtration count	A9222B	CFU/100mL
Heterotrophic Plate Count	A9215E / SimPlate	MPN/mL
Sulfate Reducing Bacteria	Indicating ampule - Can take up to 28 days to complete	CFU/mL
Iron Bacteria	A9240B/ Biological Activity Reaction Test (BART) – Can take up to 10 days to complete	CFU/mL
Slime Forming Bacteria	Indicator – Can take up to 8 days to complete	CFU/mL
NOTE: Weekend and holiday rate may apply.		

1. Must schedule a week in advance.

WATER
PARAMETER GROUPING

1. HEALTH AND WATER QUALITY

Parameter	Parameter
Potassium	Total Dissolved Solids
Sodium	Alkalinity
Calcium	Conductivity
Magnesium	pH
Sulfate	Nitrate + Nitrite as N
Chloride	Fluoride
Hardness	Iron
Sampling: 1-500ml white capped plastic bottle, 1-250ml red capped plastic bottle, 1-250ml yellow capped plastic bottle, unpreserved. Store at 4-6°C. Preservatives will be added at the laboratory	
Holding Time: Various - refer to Sampling and Preservation table located in the back of this section	
Health and water quality Analysis Sample Without Bacteria	
Health and water quality Analysis Sample With Bacteria	

2. LIVESTOCK AND IRRIGATION SUITABILITY

Parameter	Parameter	Parameter
Nitrate + Nitrite as N	Conductivity	Sulfate
pH	Calcium	Total Dissolved Solids (see notes)
Magnesium	Sodium	Sodium Adsorption Ratio
Sampling: 1-1L white capped plastic bottle, 1-250ml yellow capped plastic bottle, unpreserved. 1-250ml red capped plastic bottle unpreserved. Store at 4-6°C. Preservatives to be added at the laboratory.		
Holding Time: Various - refer to Sampling and Preservation table located in the back of this section		
Livestock Suitability Sample		

3. RESIDENTIAL-STANDARD HOME LOAN

Parameter	Parameter
Nitrite	Bacteria
Nitrate	
Lead	
Sampling: 1-1L white capped plastic bottle, 1-250ml yellow capped plastic bottle, unpreserved. 1-250ml white capped plastic bottle unpreserved, 1 100mL sterile plastic bottle. Store at 4-6°C. Preservatives to be added at the laboratory.	
Holding Time: 30 hours	
Residential-Standard Home Loan sample	

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4. TOTAL COLIFORM BACTERIA ANALYSIS

Sampling: 1-sterile sample container received from laboratory. Maintain at normal water temperature or Store at 4-6°C. **Holding Time:** 30 hours	
Note: The analysis takes 24 hours to complete. Weekend and holiday rate may apply.	
Total Coliform Bacteria Analysis Sample	

5. METALS SCAN

Aluminum	Cadmium	Iron	Nickel	Sodium
Antimony	Calcium	Lead	Phosphorus	Strontium
Barium	Chromium	Magnesium	Potassium	Thallium
Beryllium	Cobalt	Manganese	Silicon	Titanium
Boron	Copper	Molybdenum	Silver	Vanadium
-	-	-	-	Zinc

Sampling: **Holding Time:**	1-250 mL plastic bottle preserved with HNO3 (red capped ampule). 6 months
ICP Scan:	Analyzed in water by ICP to a 0.1 mg/L reporting limit. (Calcium, Magnesium, Sodium, Potassium 5 mg/L reporting limit.)
ICP Scan Sample	
ICP-MS Scan:	A semi-quantitative analysis of water by ICP-MS. This includes 65 elements from lithium at 7 atomic mass units (amu) through uranium (238 amu). Semi-quantitative measurements are made at the sub parts per billion concentration range. Not included are scandium, yttrium, indium, bismuth, Germanium, and gold.
ICP-MS Scan Sample	

RECOMMENDATIONS FOR
SAMPLING AND PRESERVATION OF WATERS

MEASUREMENT	Volume Required (mL)	Container P=Plastic G=Glass	PRESERVATIVE	HOLDING TIME
Preservative ampules:	HNO3 – nitric acid (red cap) H2SO4 - sulfuric acid (yellow cap) HCl - hydrochloric acid (blue cap) H3PO4 - phosphoric acid (white cap) NaOH - sodium hydroxide (green cap) Zinc acetate (purple cap)			
Major minerals, including the following: Potassium, Sodium, Calcium, Magnesium, Sulfate, Chloride, Bicarbonate, Carbonate, pH, Specific Conductance, Total Dissolved Solids	500	P or G	Cool, ≤ 6°C	See holding times for each individual parameter, below
METALS				
Dissolved Metals	250	P	Filter (0.45 micron), then add HNO_3 to pH<2	6 months
Total Metals	250	P	HNO_3 to pH <2	6 months
Chromium^{+6}	200	P	Cool, ≤ 6°C	24 hours
Ferrous Iron	100	P	Filter (0.45 micron), then add HNO_3 to pH<2	48 hours
(Fe II - requires field filtering)				
Mercury	100	P	Same as tot. or diss. metals	28 days
Mercury (E245.7)	100	P or G	HCL to pH <2	3 months
NON-METALLICS				
Acidity	100	P or G	Cool, ≤ 6°C	14 days
Alkalinity	100	P or G	Cool, ≤ 6°C	14 days
Biochemical Oxygen Demand (BOD)	1000	P or G	Cool, ≤ 6°C	48 hours
Bromide	100	P or G	None Required	28 days
Carbonaceous BOD	1000	P or G	Cool, ≤ 6°C	48 hours
Chemical Oxygen Demand (COD)	50	P or G	H_2SO_4 to pH <2, Cool, ≤ 6°C	28 days
Chloride	50	P or G	None Required	28 days
Chlorine	50	P or G	None Required	15 minutes
Chlorophyll a	1000	P or G	Cool, ≤ 6°C, keep in the dark	28 days
Color	50	P or G	Cool, ≤ 6°C	48 hours
Conductance	100	P or G	Cool, ≤ 6°C	28 days
Cyanates	500	Dark P	NaOH to pH >12, Cool, ≤ 6°C	14 days
Cyanides	500	Dark P	NaOH to pH >12, Cool, ≤ 6°C	14 days
Ethylene Glycol	500	P or G	Cool, ≤ 6°C	NA

RECOMMENDATIONS FOR
SAMPLING AND PRESERVATION OF WATERS, continued

MEASUREMENT	Volume Required (mL)	Container P=Plastic G=Glass	PRESERVATIVE	HOLDING TIME
NON-METALLICS continued				
Fluoride	50	P or G	None Required	28 days
Formaldehyde	100	P or G	Cool, ≤ 6°C	NA
Iodide	100	P or G	None Required	28 days
Hardness	100	P	Cool, ≤ 6°C	6 months
Methane	Feb-40	G VOA	Zero Headspace 4 drops H_2SO_4	NA
Nitrogen, Ammonia	50	P or G	H_2SO_4 to pH <2, Cool, ≤ 6°C	28 days
Nitrogen, Total Kjeldahl	500	P or G	H_2SO_4 to pH <2, Cool, ≤ 6°C	28 days
Nitrogen, Nitrate plus Nitrite	50	P or G	H_2SO_4 to pH <2, Cool, ≤ 6°C	28 days
Nitrogen, Nitrate	50	P or G	Cool, ≤ 6°C	48 hours
Nitrogen, Nitrite	50	P or G	Cool, ≤ 6°C	48 hours
Nitrogen, Total (Persulfate Method)	50	P or G	Cool, ≤ 6°C	28 days
Oil and Grease	2 - 1000	G	H_2SO_4 to pH <2, Cool, ≤ 6°C	28 days
Organic Carbon	125	G	H_3PO_4 to pH <2, Cool, ≤ 6°C	28 days
Organic Carbon, Public Water Supply	250	G	H_3PO_4 to pH <2, Cool, ≤ 6°C	28 days
pH	25	P or G	None Required	15 minutes
Phenolics by E420.4	250	G	H_2SO_4 to pH <2,	28 days
Residue, Total	100	P or G	Cool, ≤ 6°C	7 days

RECOMMENDATIONS FOR
SAMPLING AND PRESERVATION OF WATERS, continued

MEASUREMENT	Volume Required (mL)	Container P=Plastic G=Glass	PRESERVATIVE	HOLDING TIME
NON-METALLICS continued				
Residue, Volatile Volatile Suspended Solids (VSS)	100	P or G	Cool, ≤ 6°C	7 days
Settleable Matter	1000	P or G	Cool, ≤ 6°C	48 hours
Sulfate	100	P or G	Cool, ≤ 6°C	28 days
Sulfide	250	P or G	Add 2 mL zinc acetate, zero headspace, NaOH to pH > 9, Cool, ≤ 6°C	7 days
Sulfite	100	P or G	1 mL of EDTA	15 minutes
Surfactants (Foaming Agents)	500	P or G	Cool, ≤ 6°C	48 hours
Tannins & Lignins	25	P or G	Cool, ≤ 6°C	14 days
Thiocyanates	100	P or G	HNO_3 to pH <2	NA
Total Petroleum Hydrocarbons (TPH)	2 - 1000	G	H_2SO_4 to pH < 2, Cool, ≤ 6°C	28 days
Total Petroleum Hydrocarbons (TPH) by TCEQ 1005	3-VOA vials with zero headspace	G	HCl to pH < 2, Cool, ≤ 6°C	14 days
Turbidity	100	P or G	Cool, ≤ 6°C	48 hours
BACTERIA				
Total Coliform Bacteria	100	Sterile	Cool, < 10°C	30 hours
Fecal Coliform Bacteria	100	Sterile	Cool, < 10°C	8 hours
E. Coli	100	Sterile	Cool, < 10°C	8 hours
Heterotrophic Plate Count	100	Sterile	Cool, < 10°C	8 hours
Sulfate Reducing Bacteria	100	Sterile	Cool, < 10°C	48 hours
Iron Bacteria	100	Sterile	Cool, < 10°C	72 hours
RADIOCHEMISTRY				
Gross Alpha / Beta	1 – 1000	P or G	HNO_3 to pH < 2	6 months
^{210}Lead	2 – 2000			
^{210}Polonium	1 – 1000			
^{226}Radium	2 – 2000			
^{228}Radium	2 – 2000			
^{230}Thorium	1 – 1000			
Uranium	1 - 1000			
^{222}Radon	3-VOA vials with zero headspace	G	Cool, ≤ 6°C	8 days