

BC ENV SAMPLE PRESERVATION & HOLDING TIME REQUIREMENTS <sup>(1,2)</sup>				Version: 21-Jan-2022	
Parameter Name	Sample Container	Storage Temp <sup>(3)</sup>	Preservation	Holding Time <sup>(4)</sup>	References
<b>Water</b>					
<b>Physical &amp; Aggregate Properties</b>					
Acidity	Plastic, Glass	≤6°C	none	14 days	APHA
Alkalinity	Plastic, Glass	≤6°C	none	14 days	APHA
Asbestos	HDPE, Glass	≤6°C, do not freeze	none	7 days	EPA 100.2 / BC ENV
Colour	Plastic, Glass	≤6°C	none	3 days	BC ENV / CCME 2016
Conductivity	Plastic, Glass	≤6°C	none	28 days	APHA
pH	Plastic, Glass	≤6°C	none	15 minutes	APHA
Solids (Total, TSS, TDS, Fixed, Volatile, etc.)	Plastic, Glass	≤6°C	none	7 days	APHA
Turbidity	Plastic, Glass	≤6°C	none	3 days	BC ENV / CCME 2016
UV Transmittance / Absorbance	Plastic, Glass	≤6°C	none	3 days	BC ENV (as per DOC)
<b>Inorganic Non-metallics</b>					
Bromide	Plastic, Glass	no requirement	none	28 days	APHA / EPA 300.1
Chloride	Plastic, Glass	no requirement	none	28 days	APHA / EPA 300.1
Chlorate, Bromate	Plastic, Glass	≤6°C	50 mg/L EDA	28 days	EPA 317.0
Chlorine, Total Residual (Free Chlorine)	Plastic, Glass	none	none	15 minutes	APHA
Chlorite	Plastic (opaque), Amber Glass	≤6°C	50 mg/L EDA	14 days	EPA 317.0
Cyanide (Total / WAD / Free)	Plastic (opaque), Amber Glass	≤6°C	field NaOH (pH > 12), store in dark, Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if residual chlorine present	14 days	APHA
			Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if residual chlorine present	24 hours	APHA
Dissolved Oxygen (Winkler Method)	BOD bottle	≤6°C	Winkler kit, store in dark	8 hours	APHA
			none	15 minutes	
Fluoride	Plastic	no requirement	none	28 days	APHA / EPA 300.1
Nitrogen, Nitrate + Nitrite	Plastic, Glass	≤6°C	H <sub>2</sub> SO <sub>4</sub> (pH < 2)	28 days	APHA
			none	3 days	BC ENV / CCME 2016
Nitrogen, Ammonia	Plastic, Glass	≤6°C	H <sub>2</sub> SO <sub>4</sub> (pH < 2)	28 days	APHA
			none	3 days	BC ENV / CCME 2016
Nitrogen, Nitrate	Plastic, Glass	≤6°C, do not freeze	none	3 days	BC ENV / CCME 2016
Nitrogen, Nitrite	Plastic, Glass	≤6°C, do not freeze	none	3 days	BC ENV / CCME 2016
Nitrogen, Total Kjeldahl	Plastic, Glass	≤6°C	H <sub>2</sub> SO <sub>4</sub> (pH < 2)	28 days	APHA
			none	3 days	BC ENV
Nitrogen, Total	Plastic, Glass	≤6°C	H <sub>2</sub> SO <sub>4</sub> or HCl (pH < 2)	28 days	APHA
			none	3 days	BC ENV / CCME 2016
Phosphorus, Dissolved (Orthophosphate)	Plastic, Glass	≤6°C	field filtration recommended	3 days	BC ENV / CCME 2016
Phosphorus, Total Reactive (Orthophosphate)	Plastic, Glass	≤6°C	none	3 days	BC ENV / CCME 2016
Phosphorus, Total Dissolved	Plastic, Glass	≤6°C	field filtration recommended, H <sub>2</sub> SO <sub>4</sub> (pH < 2)	28 days	APHA
			none	3 days	BC ENV / CCME 2016
Phosphorus, Total	Plastic, Glass	≤6°C	H <sub>2</sub> SO <sub>4</sub> (pH < 2)	28 days	APHA
			none	3 days	BC ENV / CCME 2016
Silica, Reactive	Plastic	≤6°C, do not freeze	none	28 days	APHA
Sulfate	Plastic, Glass	≤6°C	none	28 days	APHA
Sulfide	Plastic, Glass	≤6°C	ZnAc / NaOH (pH > 9)	7 days	APHA
Thiocyanate	Plastic, Glass	≤6°C	NaHSO <sub>4</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl, HNO <sub>3</sub> (pH < 2)	14 days	APHA
<b>Metals</b>					
Hexavalent Chromium	Plastic, Glass	≤6°C	1 mL 50% NaOH per 125 mL (pH > 12), field filtration recommended	28 days	EPA 1669 / CCME 2016
			none	24 hours	APHA
Metals, Dissolved	Plastic, Glass	no requirement	field filter 0.45 um, field or lab preserve w/ HNO <sub>3</sub> (pH < 2) <sup>(5)</sup>	180 days	APHA
Metals, Total	Plastic, Glass	no requirement	field or lab preserve w/ HNO <sub>3</sub> (pH < 2) <sup>(5)</sup>	180 days	APHA / EPA 200.2
Mercury, Dissolved	Glass (PTFE liner), PTFE	no requirement	field filter 0.45 um, field preserve w/ HCl (pH < 2) or lab preserve w/ BrCl <sup>(6)</sup>	28 days	APHA / EPA 1631E
Mercury, Total	Glass (PTFE liner), PTFE	no requirement	field preserve w/ HCl (pH < 2) or lab preserve w/ BrCl <sup>(6)</sup>	28 days	APHA / EPA 1631E
Methylmercury, Dissolved	Glass (PTFE liner), PTFE	≤6°C	field filter 0.45 um + HCl, H <sub>2</sub> SO <sub>4</sub> for marine water (pH < 2)	180 days	EPA 1630
			none	48 hours	
Methylmercury, Total	Glass (PTFE liner), PTFE	≤6°C	HCl, H <sub>2</sub> SO <sub>4</sub> for marine water (pH < 2)	180 days	EPA 1630
			none	48 hours	
<b>Aggregate Organics</b>					
Adsorbable Organic Halides (AOX)	Amber Glass (PTFE liner)	≤6°C	HNO <sub>3</sub> or H <sub>2</sub> SO <sub>4</sub> (pH < 2), store in dark, sodium sulfite or 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if chlorinated, collect with no headspace	180 days	APHA 5320 / EPA 40CFR 2012
Biochemical Oxygen Demand (BOD)	Plastic, Glass	≤6°C, do not freeze	none	3 days	BC ENV
Carbonaceous Biochemical Oxygen Demand (CBOD)	Plastic, Glass	≤6°C, do not freeze	none	3 days	BC ENV
Carbon, Dissolved Organic	Plastic, Glass	≤6°C	filter, H <sub>2</sub> SO <sub>4</sub> or HCl (pH < 2)	28 days	APHA
			none	3 days	BC ENV
Carbon, Dissolved Inorganic	Plastic, Glass	≤6°C	field filter	14 days	APHA (alkalinity)
Carbon, Total Organic	Plastic, Glass	≤6°C	H <sub>2</sub> SO <sub>4</sub> or HCl (pH < 2)	28 days	APHA
Carbon, Total Inorganic	Plastic, Glass	≤6°C	none	14 days	APHA (alkalinity)
Chemical Oxygen Demand (COD)	Plastic, Glass	≤6°C	H <sub>2</sub> SO <sub>4</sub> , field or lab (pH < 2)	28 days	APHA
			none	3 days	BC ENV
Chlorophyll a and Phaeophytin	Filter	Filters: freeze	field filter, store in dark	Filters: 28 days	APHA
	Opaque Plastic, Amber Glass	≤6°C	unfiltered, store in dark	48 hours	
Surfactants (Methylene Blue Active Substances)	Plastic, Glass	≤6°C	none	3 days	BC ENV
Tannins and Lignins	Plastic, Glass	≤6°C	none	28 days	BC ENV
Total Phenols (4AAP)	Plastic, Glass	≤6°C	H <sub>2</sub> SO <sub>4</sub> (pH < 2)	28 days	APHA

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<b>Water</b>					
<b>Extractable Hydrocarbons</b>					
Extractable Hydrocarbons (LEPH, HEPH, EPH)	Amber Glass (PTFE liner)	≤6°C	NaHSO <sub>4</sub> , HCl, or H <sub>2</sub> SO <sub>4</sub> (pH < 2) none	14 / 40 days 7 / 40 days	EPA 3511 SW846 Ch4 2014
Oil and Grease / Mineral Oil and Grease	Amber Glass (PTFE liner)	≤6°C	HCl or H <sub>2</sub> SO <sub>4</sub> (pH < 2)	28 days	EPA 40CFR 2012
Waste Oil Content	Amber Glass (PTFE liner)	≤6°C	none	28 days	BC ENV
<b>Individual Organic Compounds</b>					
Alcohols	40 mL Glass VOA Vials (PTFE liner), 2 recommended	≤6°C	NaHSO <sub>4</sub> or H <sub>2</sub> SO <sub>4</sub> (pH < 2) none	14 days 7 days	SW846 EPA 3511 SW846 Ch4 2014
Carbamate Pesticides	Amber Glass (PTFE liner)	≤6°C	Potassium Dihydrogen Citrate (solid), ~pH 3.8, 9.2-9.5 g/L, + 100 mg/L Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if chlorinated	28 days	EPA 531.2, APHA 6610B
			ChlorAC buffer, ~pH 3, 1.8 mL/60 mL sample, + 100 mg/L Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if chlorinated	28 days	EPA 531.1
			none, 100 mg/L Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if chlorinated	7 days	SW846 EPA 8321A
Chlorinated and Non-chlorinated Phenolics	Amber Glass, PTFE liner	≤6°C	NaHSO <sub>4</sub> or H <sub>2</sub> SO <sub>4</sub> (pH < 2) (optional: +0.5g Ascorbic Acid / L) <sup>(7)</sup>	14 / 40 days	CCME 2016 / Alberta Env AE130
			none	7 / 40 days	SW846 Ch4 2014
Dioxins / Furans	Amber Glass (PTFE liner)	≤6°C	none	unlimited	SW846 Ch4 2014
Disopropanolamine (DIPA)	Amber Glass (PTFE liner), HDPE, PP, PET	≤6°C	NaHSO <sub>4</sub> , HCl, or H <sub>2</sub> SO <sub>4</sub> (pH < 2)	14 / 40 days	SW846 EPA 3511
			none	7 / 40 days	SW846 Ch4 2014
17α-Ethinylestradiol (EE2)	Amber Glass (PTFE liner)	≤6°C	2-mercaptopyridine-1-oxide (65 mg/L), + Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> or ascorbic acid if chlorinated	28 days	EPA 539
			Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> or ascorbic acid if chlorinated	7 days	
Glyphosate / AMPA	Amber Glass (PTFE liner), PP, PE	≤6°C	100 mg/L Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if chlorinated	14 days	APHA 6651B
Glycols	Glass (PTFE liner)	≤6°C	NaHSO <sub>4</sub> , HCl, or H <sub>2</sub> SO <sub>4</sub> (pH < 2)	14 / 40 days	SW846 EPA 3511
			none	7 / 40 days	SW846 Ch4 2014
Halogenated Hydrocarbons (Semi-Volatile)	Amber Glass (PTFE liner)	≤6°C	100 mg/L Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if chlorinated	7 / 40 days	SW846 Ch4 2014
Herbicides, Acid Extractable	Amber Glass (PTFE liner)	≤6°C	HCl to pH < 2 (optional), store in dark, 50 mg/L sodium sulfite if chlorinated	14 / 21 days	APHA 6640A
Nitrilotriacetic Acid (NTA)	Plastic, Glass	≤6°C	NaHSO <sub>4</sub> (pH < 2)	14 days	SW846 EPA 3511
			none	24 hours	EPA-600/4-79-020
Nonylphenols and Ethoxylates	Amber Glass (PTFE liner)	≤6°C	NaHSO <sub>4</sub> , HCl, or H <sub>2</sub> SO <sub>4</sub> (pH < 2)	14 / 40 days	ASTM D7485-16
			none	7 / 40 days	SW846 Ch4 2014
Organotins	Amber Glass (PTFE liner), Opaque HDPE, PTFE	freeze (≤ -10°C) within 3 days	store in dark	28 / 40 days	Env Sci Pollut Res (2016) 23:4876-4885
		≤6°C	0.5-1% acetic acid, store in dark	14 / 40 days	
		≤6°C	none, store in dark	3 / 40 days	
Paraquat / Diquat	Opaque Plastic	≤6°C	100 mg/L Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if chlorinated, store in dark	7 / 21 days	EPA 549.2
Perfluoroalkyl Substances (PFAS)	HDPE (preferred), PP, avoid PTFE	≤6°C	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> or TRIS base if chlorinated	28 / 40 days	D7979-15 / EPA 537
Pesticides (OC/OP/ON)	Amber Glass (PTFE liner)	≤6°C	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if chlorinated, NaHSO <sub>4</sub> (pH < 2) <sup>(8)</sup>	14 / 40 days	SW846 EPA 3511
			Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if chlorinated	7 / 40 days	SW846 Ch4 2014
Polybrominated Diphenyl Ethers (PBDEs)	Amber Glass (PTFE liner)	≤6°C	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if chlorinated, store in dark	1 year	EPA 1614
Polychlorinated Biphenyls (PCBs)	Amber Glass (PTFE liner)	≤6°C	none required (may be acidified)	unlimited	SW846 Ch4 2014
Polycyclic Aromatic Hydrocarbons (PAHs)	Amber Glass (PTFE liner)	≤6°C	NaHSO <sub>4</sub> , HCl, or H <sub>2</sub> SO <sub>4</sub> (pH < 2)	14 / 40 days	SW846 EPA 3511
			none	7 / 40 days	SW846 Ch4 2014
Resin Acids, Fatty Acids	Amber Glass (PTFE liner)	≤6°C	(0.5g Ascorbic Acid + 0.4g NaOH) / L	14 / 40 days	Alberta Env AE129
			none	7 / 40 days	SW846 Ch4 2014
Sulfolane	Amber Glass (PTFE liner)	≤6°C	NaHSO <sub>4</sub> , HCl, or H <sub>2</sub> SO <sub>4</sub> (pH < 2)	14 / 40 days	SW846 EPA 3511
			none	7 / 40 days	SW846 Ch4 2014
Tetraethyl Lead	Amber Glass (PTFE liner)	≤6°C	collect with no headspace, field preserve with NaOH or KOH (pH > 12)	14 / 40 days	BC ENV
Volatile Organic Compounds (VOC, BTEX, THM, VH)	40mL Glass VOC Vials (PTFE liner), 2 recommended	≤6°C	collect with no headspace, 200 mg NaHSO <sub>4</sub> , or 3 mg Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if chlorinated (see Lab Manual method for other options and details)	14 days	BC ENV
<b>Microbiological Parameters <sup>(9)</sup></b>					
Coliforms, Total, Thermotolerant (Fecal), & Ecoli	Sterile Glass or Plastic	<10°C, do not freeze	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	30 hours	BC CDC / APHA 9060B
Microbiological Parameters (9)	Sterile Glass or Plastic	<20°C, do not freeze	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	4 days	EPA 1623 / APHA 9060B
Enterococcus	Sterile Glass or Plastic	<10°C, do not freeze	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	30 hours	APHA 9060B
Heterotrophic Plate Count	Sterile Glass or Plastic	<10°C, do not freeze	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	24 hours	APHA 9215
<b>Toxicity</b>					
Daphnia, Chronic 21 day / Chronic EC25	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	3 days	EC EPS1/RM21
Daphnia, LC50 or Limit, Pass/Fail Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	5 days	EC EPS 1/RM14 & 11
Microtox	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	3 days	EC EPS 1/RM24
Trout, LC50	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	5 days	EC EPS 1/RM13 & 9
Trout, Single Concentration Test, Pass/Fail	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	5 days	EC EPS 1/RM13 & 9
Marine Pacific Salmonid 96h Acute Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	5 days	EC EPS 1/RM13 & 9
Salmonid Early Life Stage Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	3 days	EC EPS1/RM28
Ceriodaphnia dubia Chronic Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	3 days	EC EPS1/RM21
Freshwater Green Alga Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	3 days	EC EPS1/RM25
Duckweed Growth Inhibition Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	3 days	EC EPS1/RM37
Topsmelt 7d Survival and Growth Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	36 hours	EPA 600/R-95/136 1006.0
Echinoderm Fertilisation Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	3 days	EC EPS 1/RM27
Bivalve Larval Development Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	36 hours	EPA 600/R-95/136 1005.0
Giant Kelp Sublethal Toxicity Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	36 hours	EPA 600/R-95-136 1009.0
Red Alga, C. Parvula Reproduction Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	36 hours	EPA 821-R-02-014 1009.0
Mysid Shrimp Survival and Growth Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	36 hours	EPA 821-R-02-014 1007.0

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<b>Soil and Sediment</b>					
<b>Inorganics</b>					
Asbestos	Glass, Plastic <sup>(15)</sup>	no requirement	none	14 days, indefinite if dried	ASTMD7521-16, EPA 600/R-93/116
BC Leachate Method - Metals/Inorganics	Glass, Plastic <sup>(15)</sup> 2 x 500 mL recommended	no requirement	none	180 days	SW846 EPA 1313
Bromide / Chloride / Fluoride	Glass, Plastic <sup>(15)</sup>	no requirement	none	unlimited	Carter (Table 4.1)
Cyanide (Total / WAD / Free)	Glass, Plastic <sup>(15)</sup>	≤6°C	store field moist, extracts: NaOH	14 / 14 days	SW846 EPA 9013A
Hexavalent Chromium	Glass, Plastic <sup>(15)</sup>	≤6°C	store field moist	30 / 7 days	SW846 Ch3 2014 / SW846 EPA 3060A
Metals	Glass, Plastic <sup>(15)</sup>	no requirement	none	180 days	SW846 Ch3 2014
Mercury	Glass, Plastic <sup>(15)</sup>	no requirement	none	28 days	SW846 Ch3 2014
Methylmercury	Glass, Plastic <sup>(15)</sup>	≤6°C	none	28 days	CCME 2016
MLEP - Nitrate, Nitrite	Glass, Plastic <sup>(15)</sup>	≤6°C	none	14 / 3 days	BC ENV
Nitrogen species (Nitrite, Nitrate)	Glass, Plastic <sup>(15)</sup>	≤6°C	dry at ≤ 60°C for unlimited hold time for N+N, the sum of nitrite + nitrate <sup>(10)</sup>	unlimited / 3 days <sup>(10)</sup>	ISO 14256-2 / Carter / Soil Analysis Handbook of Reference Methods
			none	3 / 3 days <sup>(10)</sup>	
pH	Glass, Plastic <sup>(15)</sup>	no requirement	none	365 days	Carter
Sulfide	Glass (PTFE liner)	≤6°C	store field moist	14 days	EPA 821/R-91-100, APHA 4500 S2-
TCLP, SPLP, MLEP - Mercury	Glass, Plastic <sup>(15)</sup>	no requirement	sample: none extracts: HNO <sub>3</sub> , HCl, or BrCl	28 / 28 days	SW846 EPA 1311, 1312, BC ENV
TCLP, SPLP, MLEP - Metals	Glass, Plastic <sup>(15)</sup>	no requirement	sample: none extracts: HNO <sub>3</sub>	180 / 180 days	SW846 EPA 1311, 1312
<b>Organics</b>					
Alcohols	Glass (PTFE liner)	≤6°C <sup>(11)</sup>	collect with minimal headspace	14 days	SW846 Ch4 2014
BC Leachate Method - Semi-Volatile Organics	Glass (PTFE liner)	≤6°C <sup>(11)</sup>	none	14 days	BC ENV
BC Leachate Method - Volatile Organics	Glass (PTFE liner)	≤6°C	collect with minimal headspace	48 hours <sup>(12)</sup>	BC ENV
Carbon (TC, TOC)	Glass, Plastic <sup>(15)</sup>	≤6°C	none	28 days	SW846 Ch3 2014
	Glass, Plastic <sup>(15)</sup>	no requirement	dried state	unlimited	Carter (Table 4.1)
Chlorinated and Non-chlorinated phenolics	Glass (PTFE liner)	≤6°C <sup>(11)</sup>	none	14 / 40 days	SW846 Ch4 2014
Dioxins / Furans	Glass (PTFE liner)	≤6°C	none	unlimited	SW846 Ch4 2014
Diisopropanolamine (DIPA)	Glass (PTFE liner)	≤6°C <sup>(11)</sup>	none	14 / 40 days	SW846 Ch3 2014
Extractable Hydrocarbons (LEPH, HEPH, EPH)	Glass (PTFE liner)	≤6°C <sup>(11)</sup>	none	14 / 40 days	SW846 Ch4 2014
Glycols	Glass (PTFE liner)	≤6°C <sup>(11)</sup>	none	14 / 40 days	SW846 Ch4 2014
Halogenated Hydrocarbons (Semi-Volatile)	Glass (PTFE liner)	≤6°C <sup>(11)</sup>	none	14 / 40 days	SW846 Ch4 2014
Herbicides, Acid Extractable	Glass (PTFE liner)	≤6°C <sup>(11)</sup>	none	14 / 40 days	SW846 Ch4 2014
Nonylphenols and Ethoxylates	Glass (PTFE liner)	≤6°C <sup>(11)</sup>	none	14 / 40 days	SW846 Ch4 2014
Oil and Grease / Mineral Oil and Grease / Waste Oil Content	Glass (PTFE liner)	≤6°C <sup>(11)</sup>	none	28 days	SW846 Ch3 2014, Puget Sound Protocols
Organotins	Glass (PTFE liner), HDPE, PTFE	≤6°C <sup>(11)</sup>	none	28 / 40 days	Fres. J Anal Chem (1991) 339:6-14
Perfluoroalkyl Substances (PFAS)	Plastic, Glass, avoid PTFE (HDPE or PP recommended)	≤6°C <sup>(11)</sup>	none	28 / 40 days	ASTMD7968-14
Pesticides (OC/OP/ON)	Glass (PTFE liner)	≤6°C <sup>(11)</sup>	none	14 / 40 days	SW846 Ch4 2014
Polybrominated Diphenyl Ethers (PBDEs)	Glass (PTFE liner)	≤6°C <sup>(11)</sup>	none	1 year	EPA 1614
Polychlorinated Biphenyls (PCBs)	Glass (PTFE liner)	≤6°C	none	unlimited	SW846 Ch4 2014
Polycyclic Aromatic Hydrocarbons (PAHs)	Glass (PTFE liner)	≤6°C <sup>(11)</sup>	none	14 / 40 days	SW846 Ch4 2014
Resin Acids, Fatty Acids	Glass (PTFE liner)	≤6°C <sup>(11)</sup>	none	14 / 40 days	SW846 Ch4 2014
Sulfonates	Glass (PTFE liner)	≤6°C <sup>(11)</sup>	none	14 / 40 days	SW846 Ch4 2014
TCLP, SPLP, MLEP - Volatile Organic Compounds	Glass (PTFE liner)	≤6°C	sample: none extracts: NaHSO <sub>4</sub> , HCl, or H <sub>2</sub> SO <sub>4</sub>	14 / 14 days	SW846 EPA 1311, 1312
			none	14 / 7 / 40 days	SW846 EPA 1311, 1312
TCLP, SPLP, MLEP - Semi-Volatile Organic Compounds	Glass (PTFE liner)	≤6°C	extracts: NaHSO <sub>4</sub> , HCl, or H <sub>2</sub> SO <sub>4</sub>	14 / 14 / 40 days	SW846 EPA 1311, 1312, 3511
Tetraethyl Lead	Glass (PTFE liner)	≤6°C	none	14 days / 40 days	BC ENV
Volatile Organic Compounds (VOC, BTEX, VH)	Pre-weighed sealed glass vial charged with methanol preservative (PTFE liner) + glass soil jar for moisture	≤6°C	methanol (exact volume, e.g. 10.0 mL)	40 days	SW846 EPA 5035A / CCME 2016
	Hermetic sampler + glass soil jar for moisture <sup>(12)</sup>	≤6°C	none	48 hours <sup>(12)</sup> / 40 days	SW846 EPA 5035A / CCME 2016 / ASTM D6418-09
<b>Toxicity</b>					
Freshwater Amphipod H. azteca Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	2-6 weeks <sup>(13)</sup>	EC EPS 1/RM/33
Chironomus Survival and Growth Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	2-6 weeks <sup>(13)</sup>	EC EPS 1/RM/32
Oligochaete Worm Survival and Growth Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	2-6 weeks <sup>(13)</sup>	EPA 600/R-99/064
Solid Phase Microtox Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	2-6 weeks <sup>(13)</sup>	EC EPS 1/RM/42
Echinoderm Larval Development Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	2-6 weeks <sup>(13)</sup>	EC EPS 1/RM/58
Marine Amphipod 10d Acute Toxicity Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	2-6 weeks <sup>(13)</sup>	EC EPS 1/RM/26
Echinoderm Larval Development Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	2-6 weeks <sup>(13)</sup>	EC EPS 1/RM/58
Polychaete Worm Survival and Growth Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	2-6 weeks <sup>(13)</sup>	EC EPS 1/RM/41
Marine Sediment Bioaccumulation Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	2-6 weeks <sup>(13)</sup>	EPA 600/R-93/183
Earthworm Toxicity Tests	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	2-6 weeks <sup>(13)</sup>	EC EPS 1/RM/43
Springtail Survival and Reproduction Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	2-6 weeks <sup>(13)</sup>	EC EPS 1/RM/47
Terrestrial Plant Toxicity Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	2-6 weeks <sup>(13)</sup>	EC EPS 1/RM/45
Boreal Region Plant Toxicity Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	2-6 weeks <sup>(13)</sup>	EC EPS 1/RM/56
Earthworm Bioaccumulation Test	Plastic, Glass (non-toxic)	4±2°C, do not freeze	minimize air space, store in dark	2-6 weeks <sup>(13)</sup>	ASTM E1676-12, OECD 317

**BC ENV SAMPLE PRESERVATION & HOLDING TIME REQUIREMENTS <sup>(1,2)</sup>** **Version: 21-Jan-2022**

Parameter Name	Sample Container	Storage Temp <sup>(3)</sup>	Preservation	Holding Time <sup>(4)</sup>	References
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**Biota**

**Inorganics**

Metals	Plastic, Glass	freeze (≤ -10°C) within 48 hrs <sup>(14)</sup>	none	2 years <sup>(14)</sup>	Puget Sound Protocols
Mercury	Plastic, Glass	freeze (≤ -10°C) within 48 hrs <sup>(14)</sup>	none	1 year <sup>(14)</sup>	EPA 1631 Appendix

**Organics**

Semi-Volatile Organic Compounds	Glass (PTFE liner), PTFE	freeze (≤ -10°C) within 24 hrs	none	365 / 40 days	Puget Sound Protocols EPA 1699
Volatile Organic Compounds	Glass (PTFE liner), PTFE	freeze (≤ -10°C) within 24 hrs	none	14 days	Puget Sound Protocols

**Air (Vapours)**

VOCs by Canister Sampling	SS canister	ambient	none	30 days	EPA TO15
VOCs by Thermal Desorption	thermal desorption tube	≤6°C	none	30 days	EPA TO17
VOCs and other Volatile Substances by Charcoal and Miscellaneous Collection Media	see BC Lab Manual Method	≤6°C (or as per applicable reference method)	none	30 days	BC ENV

**Footnotes**

- 1 A Director or an *Environmental Management Act (EMA)* permit or legal instrument may specify alternate requirements.
- 2 Refer to applicable BC Environmental Laboratory Manual methods for additional detail, including references. Where differences exist between this table and specific BC Lab Manual methods or BC Field Sampling Manual guidance, this table takes precedence, except for new methods or guidance published with later revision dates than this table.
- 3 Storage temperature applies to storage at the laboratory. For all tests where refrigeration at ≤ 6°C is required at the laboratory, samples should be packed with ice or cold packs to maintain a temperature of ≤10°C during transport to the laboratory. Temperature during transport for toxicity test samples should be 4±3°C (or as per reference method). To prevent breakage, do not freeze water samples stored in glass. Except where indicated by "do not freeze", qualification of test results is not required for frozen water samples. Labs may apply a "Cooling Initiated" qualifier on reports to indicate where samples were received above specified storage temperature, but where sampling occurred the same day as arrival at the lab, and where samples were packed appropriately in coolers with ice/cold packs to initiate cooling.
- 4 Hold Times: Single values refer to hold time from sampling to initiation of analysis. Where two values are given, the first is hold time from sampling to extraction, and the second is hold time from extraction to analysis. Three values are given for TCLP semi-volatiles (first is from collection to TCLP extraction; second is from TCLP extraction to preparative extraction; third is from preparative extraction to analysis). All laboratory test results for samples analyzed beyond applicable hold times must be qualified.
- 5 For dissolved metals, field filtration is required for *EMA* purposes (lab-filtered metals results are not acceptable and must be qualified if reported). If not field-preserved, water samples for metals analysis must be acidified at the lab in their original containers by addition of HNO<sub>3</sub> (within 14 days of sampling), then equilibrated at least 16 hours prior to sub-sampling or analysis; this approach is applicable to total metals and field-filtered dissolved metals (not applicable to mercury).
- 6 For dissolved mercury, field filtration is required for *EMA* purposes (lab-filtered mercury results are not acceptable and must be qualified if reported). Use only glass or PTFE containers to collect water samples for total or dissolved mercury. For total mercury, field-preserve with HCl or lab-preserve with BrCl. For dissolved mercury, field filter, then field-preserve with HCl or lab-preserve with BrCl. BrCl lab-preservation must use original sample container, within 28 days of sampling, and samples must be oxidized for 24 hours prior to sub-sampling or analysis.
- 7 Optional preservation with ascorbic acid is based on Alberta Environment method AE 130, and is intended to prevent oxidation of chlorocatechols and chloroguaiacols.
- 8 Confirm stability of all target analytes at acidic pH (for duration of hold time) before using acid preservation.
- 9 BC ENV Guidance for Microbiological testing is applicable to environmental monitoring applications. Drinking water testing must be performed by approved test methods as defined by the BC Enhanced Water Quality Assurance (EWQA) Program in compliance with the BC Drinking Water Protection Act.
- 10 3 day hold time for nitrogen species (nitrate, nitrite) applies to field-moist soils. Dry soils at ≤ 60°C to extend hold time indefinitely (unlimited) for NO<sub>3</sub>+NO<sub>2</sub> (N+N), the sum of nitrate + nitrite.
- 11 Where indicated, soils for SVOC analysis may be frozen (within original hold time) at ≤ -10°C to extend hold time before extraction to 1 year (Reference: EPA 1699, 1668C, 1613B, 1614, and SW846 Chapter 4). Optimal long-term storage temperature is ≤ -18°C.
- 12 Methanol extracts are stable for 40 days from sampling. Hermetic samples must be methanol-extracted within 48 hours of sampling or may be frozen at ≤ -7°C (within 48 hours of sampling) to extend hold time to 7 days from sampling. Frozen hermetic samples must be extruded into methanol while still predominantly or partially frozen.
- 13 Recommended hold time for sediment toxicity tests is 2 weeks (ideally tests should be initiated within 1-2 weeks after sampling). Maximum hold time is 6-8 weeks (as indicated). Consult reference methods for further guidance.
- 14 Freezing is optional for freeze-dried tissue samples and for vegetation that is dried prior to digestion and reported on a dry weight basis; in these cases, samples may be stored at ambient temperature, with a hold time of 28 days for mercury and 6 months for other metals (based on BC ENV soil guidelines).
- 15 Plastic bags (HDPE, LDPE, or PP) are permissible for specified parameters in soil, as indicated.