

**Table C-1
Requirements for Containers, Preservation Techniques,
Sample Volumes, and Holding Times**

Analysis^a	Analytical Methods	Container^b	Preservation^{c,d}	Minimum Sample Volume or Weight^e	Maximum Holding Time^f
Volatile Organic Compounds	EPA 524.2, SW846/8260B (water)	G (VOC vial), Teflon-lined septum	Off site: Cool, 4°C, HCl to pH < 2, no headspace. On-site: Cool, 4°C, no headspace.	3 x 40 mL vials- EPA 524.2; 3 x 40 mL vials- SW846/8260B	14 days if preserved; 7 days if unpreserved
Volatile Organic Compounds	SW846/8260B; prep method SW846/5035 (soil/sediment)	EnCore® sampler	Sampler: Cool, 4°C	3 x EnCore® samplers	48 hours if only cooled to 4°C 48 hours for Encore® or equivalent samplers unless extruded and preserved within 48 hours as follows: <ul style="list-style-type: none">• Frozen• Sodium bisulfate• Methanol 14 days for extruded and preserved samples.
Volatile Organic Compounds	SW846/8260B Selective Ion Monitoring (SIM) (Biota/cranberries)	16-oz glass jar, Teflon-lined cap	Freeze	2 16-oz glass jars per sample	1 year frozen
Volatile Organic Compounds	TO-15 (air)	6-liter Summa® Canister	Not applicable	Not applicable	30 days
Volatile Petroleum Hydrocarbons	MassDEP Method for the determination of Volatile Petroleum Hydrocarbons (water)	Glass vial, Teflon-lined septum	Cool, 4°C, HCl to pH<2, no headspace	3 x 40 mL vials	14 days
Volatile Petroleum Hydrocarbons	MassDEP Method for the determination of Volatile Petroleum Hydrocarbons (soil/sediment)	Glass vial, Teflon-lined septum; or EnCore® sampler	Glass vials: Cool, 4°C, 1 mL methanol for every 1 gram of soil/sediment (approximately 15 mL methanol per vial) Or EnCore® sampler: cool, 4°C	Glass vials: 2 x 40 mL vials with approximately 15 grams of sample in each vial** Or 5-25 g EnCore® sampler(s)**	28 days for samples collected in vials pre-preserved with methanol; Or 28 days for samples collected using Encore® samplers extruded and preserved in methanol within 48 hours of collection
Extractable Petroleum Hydrocarbons	MassDEP Method for the determination of Extractable Petroleum Hydrocarbons (water)	Glass amber bottle, Teflon-lined screw cap	Cool, 4°C, HCl to pH<2	2 x 1 L bottles	Samples must be extracted within 14 days and extracts must be analyzed within 40 days after extraction

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Extractable Petroleum Hydrocarbons	MassDEP Method for the determination of Extractable Petroleum Hydrocarbons (soil/sediment)	Glass amber wide-mouth jars, Teflon-lined screw cap	Cool, 4°C	1 x 4-oz. jar	Samples must be extracted within 14 days and extracts analyzed within 40 days of extraction.
Ethylene Dibromide (EDB) and/or 1,2-Dibromo-3-chloropropane (DBCP)	504.1 (water)	G, Teflon-lined cap	Cool, 4°C; Na ₂ S ₂ O ₃	3 x 40 mL	14 days until extraction with analysis to follow immediately after extraction; 7 days until extraction if unpreserved
Semivolatile Organic Compounds	SW846/8270C (water)	G (amber), Teflon-lined cap	Cool, 4°C	2 L	7 days until extraction and 40 days after extraction
Explosives (Nitroaromatics and Nitroamines) by HPLC-MS	SW846/8321A (water)	G (amber), Teflon-lined cap	Cool, 4°C	2 L	7 days until extraction and 40 days after extraction
Explosives (Nitroaromatics and Nitroamines) by HPLC	SW846/8330 modified (water and soil)	G (amber), Teflon-lined cap	Water: Cool, 4°C Soil/sediment: Cool, 4°C	Water: 2 L Soil: 50 grams	Water: 7 days until extraction and 40 days after extraction Soils/sediment: 14 days until extraction and 40 days after extraction
Dioxins and Furans	SW846/8290 (water)	Glass amber, Teflon-lined cap	Cool, 4°C	2 Liters	30 days until extraction, and 45 days after extraction
TCLP (VOC & metals)	SW846/1311, 8260B, 6010B, 7000A series (solid)	Nonvolatile extraction: G (amber), Teflon-lined cap Volatile extraction (ZHE): G (amber), Teflon-lined cap	Cool, 4°C, no headspace for volatile extraction	Nonvolatile extraction: 200 g Volatile extraction: 100 g	Volatiles: TCLP extraction 14 days, 14 days after extraction; mercury: TCLP extraction 28 days, 28 days after extraction; other metals TCLP extraction 180 days, 180 days after extraction
Dissolved Gasses	EPA Region 1 Technical Guidance for Natural Attenuation Indicators	G	Cool, 4°C, HCl to pH < 2, no headspace	Water: 3 x 40 mL vials	Water: 14 days

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Metals (except mercury)	SW846/6010B, SW846/7000 Series	P or G	Water: HNO ₃ to pH < 2	Water: 1 L	Water: 180 days
Metals	SW846/6010B (soil/sediment)	P or G	Soil/sediment: Cool, 4°C	Soil/sediment: 50 g	Soil/sediment: 180 days
Metals (except mercury)	SW846/6020A	P or G	Water: HNO ₃ to pH < 2	Water: 1 L	Water: 180 days
Mercury	SW846/7470A	P or G	Water: HNO ₃ to pH < 2	Water: 1 L	Water: 28 days
Chromium (VI)	SW846/7196A (water)	P or G	Cool, 4°C	100 mL	24 hours
Common Anions (sulfate, bromide, nitrite, nitrate, orthophosphate, chloride)	E300.0 (water)	G	Cool, 4°C	50 mL	28 days for phosphorus, chloride, bromide, sulfate; 48 hours for nitrate, nitrite, orthophosphate
Alkalinity	E310.1	P or G	Cool, 4°C	50 mL	14 days
Ammonia-N	E350.1, E350.2 (water)	P or G	H ₂ SO ₄ to pH < 2	1 L	28 days
Nitrate-N	E352 series (water)	P or G	Cool, 4°C	Water: 100 mL	Water: 48 hours
Nitrate/Nitrite-N	E353 series (water)	P or G	Cool, 4°C, H ₂ SO ₄	Water: 100 mL	Water: 28 days
Total Kjeldahl Nitrogen (TKN)	E351 series** (water)	P or G	Water: H ₂ SO ₄ to pH < 2	Water: 100 mL	Water: 28 days
Total Phosphorous	E365 series (water)	P or G	Water: H ₂ SO ₄ to pH < 2	Water: 100 mL	Water: 28 days
Total Phosphorous	E365 series (soil/sediment)	P or G	Soil/sediment: Cool, 4°C	50 g	Soil/sediment: 28 days
Orthophosphate	E365 series (water)	P or G	Cool, 4°C	100 mL	48 hours
Sulfide	E376.1	P or G	NaOH to pH < 9, ZnOAc and Cool, 4°C, no headspace	500 mL	7 days
Filterable Residue (TDS)	E160.1 (water)	P or G	Cool, 4°C	500 mL	7 days
Nonfilterable Residue (TSS)	E160.2 (water)	P or G	Cool, 4°C	500 mL	7 days
Total Solids (TS)	E160.3 (water)	P or G	Cool, 4°C	500 mL	7 days

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Total Volatile Solids (TVS)	E160.4 (water)	P or G	Cool, 4°C	100 mL	7 days
Hardness	E130.1, E130.2	P or G	HNO ₃ to pH < 2, cool, 4°C	100 mL	6 months
BOD	E405.1 (water)	G	Cool, 4°C	1 L	48 hours
COD	E410.4 (water)	P, G	H ₂ SO ₄ to pH < 2, cool, 4°C	1 L	28 days
Total Organic Carbon (TOC)	E415.1, E415.2 (water)	P, G	HCl or H ₂ SO ₄ to pH < 2, cool, 4°C	100 mL (3 X 40 ml vials)	28 days
TOC	SW846/9060 (solid)	G	Cool, 4°C	50g	28 days
Dissolved Inorganic Carbon (DIC) and Dissolved Organic Carbon (DOC)	E415.1, E415.2 (water)	P, G	Filter, HCl or H ₂ SO ₄ to pH < 2, cool, 4°C	100 mL each parameter (3 X 40 ml vials)	28 days
Nitrate-Nitrite (low level)	SM4500-NO ₃ F (water)	G	Cool, 4°C, H ₂ SO ₄	250 mL	28 days
Nitrite-N (low level)	SM4500-NO ₂ B (water)	G	Cool, 4°C	250 mL	48 hours
Ammonia-N (low level)	SM4500-NH ₃ H (water)	G	Cool, 4°C, preserved at lab	250 mL	28 days if preserved
Orthophosphate (low level)	SM4500-P E (water)	G	Cool, 4°C	250 mL	48 hours unless preserved within 48 hours as follows: <ul style="list-style-type: none"> • Frozen 28 days for preserved samples.
Total Phosphorus (low level)	MCTNP (water)	G	H ₂ SO ₄ to pH < 2, Cool, 4°C	125 mL	28 days
Total Phosphorus	SM4500-P F (water)	G	H ₂ SO ₄ to pH < 2, Cool, 4°C	125 mL	28 days
Total Nitrogen (low level)	MCTNP (water)	G	Cool, 4°C	250 mL	28 days

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Chlorophyll-a	SM10200H Spectrophotometric or Fluorometric Determination	P	Cool, 4°C, dark	500 mL	Samples on filters taken from water having pH 7 or higher may be placed in airtight plastic bags and stored frozen for three weeks. Process samples from acidic water promptly after filtration to prevent possible chlorophyll degradation from residual acidic water on filter.
Algae Identification and Enumeration	20 th edition of Standard Methods for the Examination of Water and Wastewater (1998) Section 10200	One-liter precleaned bottle pre-preserved with Lugols solution	Lugols solution with minimum headspace	One-liter	Samples must be received at the laboratory within 24 hours of collection. Samples may be kept in the dark for a maximum of two weeks
Geotechnical Parameters (Grain Size and Atterburg Limits)	ASTM D-422 and ASTM D-4318	As required by the method.	None	500 g	None
Standard Test Method for Determination of Iodine Number of Activated Carbon	ASTM D 4607-94	As required by method.	None	5 g	None
Standard Test Methods for Moisture in Activated Carbon	ASTM D 2867-04	As required by method.	None	50 g	None
Standard Test Method for Apparent Density of Activated Carbon	ASTM D 2854-96	As required by method.	None	As required by method.	None
American Water Works Association (AWWA) procedure for Abrasion Number	AWWA B604-96	As required by method.	None	As required by method.	None
Standard Test Method for Determination of Contact pH with Activated Carbon	ASTM D 6851-02	As required by method.	None	10 g	None
Standard Test Method for Particle Size Distribution of Granular Activated Carbon	ASTM D 2862-97	As required by method.	None	100 g	None
Standard Test Method for Water Solubles in Activated Carbon	ASTM D 5029-98	As required by method.	None	20 g	None

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Standard Test Method for Total Ash Content of Activated Carbon	ASTM D 2866-94	As required by method.	None	1 g	None
Perchlorate	Low-level modified EPA 314.0 (Water)	P or G	Water: Cool, 4°C	Water: 250 mL (volume for EPA Method 314.0 and EPA Method 331.0, in case confirmation needed)	Water: 28 days
Perchlorate	EPA Method 331.0 LC/MS/MS (Water and Soil/Sediment)	P or G	Water: Cool, 4°C Soil/Sediment: Cool, 4°C	Water: 50 mL Soil/Sediment: 100 g	Water and soil/sediment: 28 days
Perchlorate	SW6850 LC/MS or LC/MS/MS (Water and Soil/Sediment)	P for water, and amber G for soil	Water: Cool, 4°C Soil/Sediment: Cool, 4°C Note: Water samples should be field filtered through a 0.2 µm PTFE membrane filter. All samples should be stored with one-third headspace to reduce potential anaerobic biodegradation.	Water: 10 mL Soil/Sediment: 5 g	Water: 28 days Soils/sediment: 28 days until extraction and 28 days after extraction. Note: Soil extract should be stored with headspace.

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Notes:

**Soil sample will also be collected in one unpreserved glass container for percent moisture analysis, if EPH soil is not submitted for the same sample.

- a. Samples collected from the same location for analyses that require the same preservation may be combined into one sample container (adequate volume will be submitted) (e.g., metals and hardness; or anions, alkalinity, and TDS/TSS).
- b. Polyethylene (P), glass (G)
- c. No pH adjustment for solids
- d. All temperature preservation requirements are +/- 2 degrees of the temperature specified.
- e. Additional volume for QC samples will be submitted as required.
- f. Holding times are measured from date of sample collection.

ASTM = American Society for Testing and Materials
 BOD = biological oxygen demand
 °C = degrees Celsius
 COD = chemical oxygen demand
 EPH = Extractable Petroleum Hydrocarbons
 g = grams
 HCl = hydrochloric acid
 HNO₃ = nitric acid
 HPLC = High Performance Liquid Chromatography
 H₂SO₄ = sulfuric acid
 L = liter
 LC = Liquid Chromatography
 MassDEP = Massachusetts Department of Environmental Protection
 mL = milliliter
 MS = Mass Spectrometry
 µm = micrometer

NA = not applicable
 Na₂S₂O₃ = sodium thiosulfate
 oz. = ounce
 PTFE = polytetrafluoroethylene
 QC = quality control
 TCLP = Toxicity Characteristic Leaching Procedure
 TDS = total dissolved solids
 TKN = total kjeldahl nitrogen
 TOC = total organic carbon
 TS = total solids
 TSS = total suspended solids
 TVS = total volatile solids
 VOC = volatile organic compound
 VPH = Volatile Petroleum Hydrocarbons
 ZHE = zero headspace extraction