



Summary of Sample Containers, Preservatives and Holding Time Requirements

Analytical Parameter	Method Reference	Container		Preservation	Holding Time	
		Water	Soil / Sed.		Water	Solid
Alkalinity	2320 B-97	500 mL HDPE ⁽¹⁾	4 oz. WMG	Cool 0 - 6°C	14 Days	14 Days
Ammonia (Colorimetric)	350.1 / 4500-NH3 H-97	500 mL HDPE	4 oz. WMG	Water: Cool 0 - 6°C, pH <2 with 9N H ₂ SO ₄ Solid: Cool 0 - 6°C	28 Days	7 Days ^(a)
Ammonia (ISE)	350.3 / 4500-NH3 D-97				48 Hr ⁽²⁾	
Anions (Cl ⁻ , Br ⁻ , F ⁻ , NO ₂ ⁻ , NO ₃ ⁻ , SO ₄ ⁻² , PO ₄ ⁻³)	300.0 / 9056 / 4110 B-00	500 mL HDPE	4 oz. WMG	(b)	(b)	28 Days
BETX	8021 / 8260	2 ea 40 mL vial ⁽¹⁾	2 oz. WMGS ⁽¹⁾	HCl to pH < 2.0 Cool 0 - 6°C	14 Days 7 Days ⁽²⁾	14 Days
Biological Oxygen Demand (BOD)	405.1 / 5210 B-01	1 Liter HDPE	2 oz. WMG	Cool 0 - 6°C	48 Hours	7 Days
Butyl Tin Species	8270 (SIM)	2 ea 500 mL AG	8 oz. WMG	Cool 0 - 6°C	7 Days	14 Days
Cation Exchange Capacity	9080 / MSA 8 & 9	--	4 oz. WMG	--	--	28 Days
Chemical Oxygen Demand (COD)	410.4 / 5220D-97	250 mL AG	4 oz. WMG	Cool 0 - 6°C, pH <2 with 1 mL 9N H ₂ SO ₄	28 Days	28 Days
Chloride (Colorimetric)	325.2 / 4500-CL E-97	500 mL HDPE	4 oz. WMG	Cool 0 - 6°C	28 Days	28 Days
Coliform, Fecal	SM 9222 D	Coming 4 oz	4 oz. WMG	Na ₂ S ₂ O ₃ (Sod. Thiosulf.) Tablet, Cool <10 °C	8 Hours	--
Coliform, Total	SM 9222 B / 9132					
Color	2120 B-01	500 mL HDPE	--	Cool 0 - 6°C	48 Hours	--
Conductivity	120.1 / 9050A 2510B / MSA 10	500 mL HDPE	4 oz. WMG	Cool 0 - 6°C	28 Days	28 Days
Calcium Carbonate Saturation	2330-00	500 mL HDPE	--	Cool 0 - 6°C	14 Days	--
Cyanide, Total or Amenable	335.4 / 9010C / 9014/ 4500-CN	500 mL HDPE	4 oz. WMG	Cool 0 - 6°C, If no S ₂ , preserve to pH >12 with 6N NaOH If S ₂ present, do not preserve, notify lab & ship immediately.	48 Hrs ⁽²⁾ 14 Days if treated	14 Days
Cyanide, Weak Acid Dissociable (WAD)	SM4500 CN I					
Dissolved Oxygen (Winkler Titration)	4500-O C-01	BOD bottle	--	Fixed in the Field	8 Hours	--
Dissolved Oxygen (Electrode) (ORP / Eh)	2580-B 97	BOD bottle	--	--	(c)	--
Extractable Petroleum Hydrocarbons (EPH)	WDOE-EPH (1997)	2 ea 500 mL AG	8 oz. WMG	Cool 0 - 6°C w/ 1:1 HCl, pH ≤ 2.0	7 Days 14 Day	14 Days
Fluoride (ISE)	340.2 / 9214 / 4500-F C-97	500 mL HDPE	4 oz. WMG	Cool 0 - 6°C	28 Days	28 Days
Glycols	EPA 8015 / EPA 5035	40 mL GV	4 oz. WMG	Cool 0 - 6°C	7 Days	14 Days
Grain Size (Gradation)	Ecology TAPE Laser Diffraction	1L HDPE	--	--	7 Days	--
Herbicides, Chlorinated	8151	2 ea 500 mL AG	8 oz. WMG	Cool 0 - 6°C	7 Days	14 Days
Hardness (Calculation)	6010 / 2340B	500 mL HDPE	--	5 mL 1:1 HNO ₃ ⁽³⁾	6 Months	--
Hexane Extractable Material (HEM) (HEM-SGT) – Oil & Grease	1664 / 9071 / 5520 G / 5520 D	1 Liter AG	4 oz. WMG	Cool 0 - 6°C, pH <2 with 5 mL 9N H ₂ SO ₄	28 Days	28 Days
Hexavalent Chromium (Cr ⁺⁶)	7196A / 3500-Cr B-01 /	500 mL HDPE	4 oz. WMG	Filter, adjust to pH 9.3 to 9.7 with NaOH	28 Days	28 Days



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	3060A Extraction			or buffer, Cool 0 - 6°C	24 Hrs ⁽²⁾	
Iron, Ferrous (Fe ⁺²)	3500 FE B-97	500 mL AG ⁽¹⁾	--	2 mL HCl conc per 100 mL of sample	(d)	--
Metals	6010 / 6020 / 200.7 / 200.8	500 mL HDPE	4 oz. WMG	Water- pH <2 with 1:1 HNO ₃ ⁽³⁾ Cool 0 - 6°C Solid- Cool 0 - 6°C	6 Months	6 Months
Methane, Ethane, Ethene	RSK-175	3 ea 40 mL vial ⁽¹⁾	--	Water- HCl to pH < 2.0, Cool 0 - 6°C	14 Days	--
Mercury	7470 / 7471 / 545.1 / 545.5	500 mL HDPE	4 oz. WMG	5 mL 1:1 HNO ₃ ⁽³⁾	28 Days	28 Days
Nitrate OR Nitrite (Colorimetric)	4500-NO3 I / 353.2	500 mL HDPE	4 oz. WMG	Cool 0 - 6°C	48 Hours	48 Hours
Nitrate + Nitrite (Colorimetric)	4500-NO3 I / 353.2	500 mL HDPE	4 oz. WMG	Cool 0 - 6°C + pH <2 with 2 mL 9N H ₂ SO ₄	28 Days	7 Days ^(a)
Organophosphorous Pesticides	8270-SIM	2 ea 500 mL AG	8 oz. WMG	Cool 0 - 6°C	7 Days	14 Days
Pentachlorophenol (PCP)	8041-Mod / 8270	2 ea 500 mL AG	8 oz. WMG	Cool 0 - 6°C	7 Days	14 Days
Pesticides or PCBs	8081 or 8082	2 ea 500 mL AG low PCB= 2 ea 1 liter AG	8 oz. WMG	Cool 0 - 6°C	7 Days	14 Days
Petroleum Hydrocarbon - Diesel (TPH-Dx) (DRO)	NWTPH-Dx / AK102	2 ea 500 mL AG	8 oz. WMG	Cool 0 - 6°C w/ 1:1 HCl, pH ≤ 2.0	7 Days 14 Day	14 Days
Petroleum Hydrocarbon - Motor Oil (TPH-Dx) (RRO)	NWTPH-Dx / AK103	2 ea 500 mL AG	8 oz. WMG	Cool 0 - 6°C	7 Days	14 Days
Petroleum Hydrocarbon Identification (HCID)	NWTPH-HCID / 8015-Mod	2 ea 500 mL AG	8 oz. WMG	Cool 0 - 6°C	7 Days	14 Days
Petroleum Hydrocarbons - Gasoline (AK 101)	AK 101, EPA 5035	2 ea 40 mL AGV ⁽¹⁾	4 oz. amber WMGS	Water- 1:1 HCl to pH < 2, Cool 0 - 6°C Solid- Methanol Surrogate mix ⁽⁸⁾	14 Days	28 Days
Petroleum Hydrocarbon - Gasoline (NWTPH-G) (GRO)	NWTPH-G, EPA 5035	40 mL GV ⁽¹⁾	2 ea 40 mL GV	Water- 1:1 HCl to pH < 2.0, Cool 0 - 6°C Solid- Methanol	14 Days 7 Days ⁽²⁾	14 Days
pH (Hydrogen Ion)	9040C / 4500 H+B / 9045D	500 mL HDPE	4 oz. WMG	--	(c)	14 Days
Phenols, GC/FID	8041-Mod	2 ea 500 mL AG	8 oz. WMG	Cool 0 - 6°C	7 Days	14 Days
Phenols	420.1 / 9065 / 5530D	250 mL AG	4 oz. WMG	Water- Cool 0 - 6°C + pH <2 with 2 mL 9N H ₂ SO ₄ Solid- Cool 0 - 6°C	28 Days	28 Days
Phosphorous, Total	365.2 / 4500-P E	500 mL HDPE	4 oz. WMG	Water- Cool 0 - 6°C + pH <2 with 2 mL 9N H ₂ SO ₄ Solid- Cool 0 - 6°C	28 Days	28 Days
Phosphorous, Ortho (Soluble Reactive Phosphorous) (SRP)	4500-P E	500 mL AG	4 oz. WMG	Filter, Cool 0 - 6°C	48 Hours	28 Days
Polynuclear Aromatic Hydrocarbon- (PAH)	8270 & 8270-SIM	2 ea 500 mL AG	8 oz. WMG	Cool 0 - 6°C	7 Days	14 Days
Polychlorinated Dibenzodioxins & Dibenzofurans	1613B / 8290A	2 ea 1 Liter AG	8 oz WMG (amber)	Water- Cool ≤ 4°C Soil- Freeze	1 Year	1 Year
Salinity	2520 B-00	500 mL HDPE	--	--	28 Days	--
Semivolatile Organics (SVOA)	8270	2 ea 500 mL AG	8 oz. WMG	Cool 0 - 6°C	7 Days	14 Days
Solids, Total (TS)	2540 B-97	1 Liter HDPE	--	Cool 0 - 6°C	7 Days ⁽⁶⁾	--
	2540 G-97 / PSEP(1986)	--	4 oz. WMG	Cool 0 - 6°C, Freeze (PSEP)	--	7 Days,



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						Freeze 6 Mo. ⁽⁶⁾ (PSEP)
Solids, Total Suspended (TSS)	2540 D-97	1 Liter HDPE	--	Cool 0 - 6°C	7 Days	--
Solids, Total Dissolved (TDS)	2540 C-97	1 Liter HDPE	--	Cool 0 - 6°C	7 Days	--
Solids, Total Volatile (TVS)	160.4 / 2540 E / 2540 G-97	1 Liter HDPE	--	Cool 0 - 6°C	7 Days	7 Days
	PSEP(1986)	--	4 oz. WMG	Cool 0 - 6°C, Freeze	7 Days	7 Days, Freeze 6 Mo. ⁽⁶⁾ (PSEP)
Solids, Settleable (SS)	2540 F-97	1 Liter HDPE	--	Cool 0 - 6°C	48 Hours	--
Solids, Volatile Suspended (TVSS)	2540 E-97	1 Liter HDPE	--	Cool 0 - 6°C	7 Days	--
Sulfate (Colorimetric)	375.2 / 9036 / 4500-SO ₄ G-97	500 mL HDPE	4 oz. WMG	Cool 0 - 6°C	28 Days	28 Days
Sulfide, Acid Volatile (AVS)	4500-S ₂ D-00	--	2 oz. WMGS ⁽¹⁾	Cool 0 - 6°C	--	14 Days
Sulfide, Acid Soluble	9030B / 9034	--	2 oz. WMGS ⁽¹⁾	Cool 0 - 6°C, 2N Zinc Acetate	--	7 Days
Sulfide, PSEP "Total"	PSEP(1986)	--	2 oz. WMGS ⁽¹⁾	Cool 0 - 6°C, 1N Zinc Acetate	--	7 Days
Sulfide (Colorimetric)	4500-S ₂ D-00 / 376.2	500 mL HDPE ⁽¹⁾	--	2 ml 1N Zinc Acetate + 1 mL 10N NaOH pH > 9.0	7 Days	--
Sulfide (Titrimetric)	4500-S ₂ F-00 / 9034					
Sulfide, Soluble	375.2 / 9036 / 4500-SO ₄ G-97	300 mL BOD Bottle	--	Cool 0 - 6°C	24 Hours	--
Sulfite	4500-SO ₃ B-00	500 mL HDPE	--	--	(d)	--
TCLP / SPLP- Metals and SVOA	EPA 1311 (TCLP), 1312 (SPLP)	WMG ⁽⁹⁾	WMG ⁽⁹⁾	Cool 0 - 6°C	(e)	(e)
TCLP - VOA	EPA 1311	40 mL GV ⁽¹⁾⁽⁹⁾	WMGS ⁽⁹⁾	Water - pH < 2.0, Cool 0 - 6°C Soil - Cool 0 - 6°C	14 Days 7 Days ⁽²⁾	14 Days
Total Kjeldahl Nitrogen (TKN)	351.2 / 351.4 mod 4500-Norg D mod	500 mL HDPE	4 oz. WMG	Cool 0 - 6°C + pH < 2 with 2 mL 9N H ₂ SO ₄	28 Days	28 Days
Total Organic Carbon (TOC) (Aqueous)	5310 B-00 / 9060	250 mL AG	--	Cool 0 - 6°C + pH < 2 with 2 mL 9N H ₂ SO ₄	28 Days	--
Total Organic Carbon (TOC) (Solid)	Plumb, 1981 ⁽⁶⁾ / PSEP	--	4 oz. WMG	Cool 0 - 6°C, Freeze (PSEP)	--	14 Days, 6 Months (PSEP)
Turbidity	180.1 / 2130 B-01	500 mL HDPE	--	Cool 0 - 6°C	48 Hours	--
Volatile Petroleum Hydrocarbons (VPH)	WDOE-VPH(1997), EPA 5035	40 mL AGV ⁽¹⁾	40 mL AGV	Water- HCl to pH < 2.0, Cool 0 - 6°C Soil- Methanol	14 Days 7 Days ⁽²⁾	14 Days
Volatile Organic Compounds (VOA)	8260 / 8260-SIM, EPA 5035	40 mL GV ⁽¹⁾	3 ea 40 mL GV ⁽¹⁾	Water- HCl to pH < 2.0, Cool 0 - 6°C Soil- NaHSO ₄ (2 vials), Methanol (2 vials) ⁽⁷⁾	14 Days 7 Days ⁽²⁾	14 Days 2 Days ⁽²⁾
Volatile Organic Compounds (VOA) Drinking Water	524.3	3 ea 40 mL AGV ⁽¹⁾	--	Ascorbic and Maleic Acid, Cool 0 - 6°C	14 Days 24 Hours ⁽²⁾	



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Containers:		Preservation & Holding Times				
AG = Amber Glass Boston Round Bottle	HDPE = High Density Polyethylene	(a) = 7 days to extraction then 48 hr (28 days w/ preservation) to analysis				
AGV = Amber Glass Vial	AHDPE = Amber HDPE	(b) = Anions: Cl ⁻ , Br ⁻ , F ⁻ – no preservative with 28 days holding time				
GV = Glass Vial	WMG = Wide Mouth Glass Jar	SO ₄ ⁻² - Cool ≤ 6°C - with 28 days holding time				
	WMGS = Wide Mouth Glass Jar with Septa	NO ₂ ⁻ , NO ₃ ⁻ , PO ₄ ⁻³ - Cool ≤ 6°C with 48 hour holding time				
		PO ₄ ⁻³ - requires filtering ≤ 15 min of sample collection (field filtration)				
		Use the most conservative preservation required for the targeted ions				
		(c) = Measure in Field or Analyze Immediately Upon Receipt in the Laboratory				
Notes:		(d)= Analyze Immediately Upon Receipt in the Laboratory				
(1) = No Headspace		(e) = Samples must be TCLP extracted within 14 days for SVOA, 28 days for Hg, and 180 days for other metals.				
(2) = When Unpreserved		(f) = When not specified by Geotech methods, ARI follows a 6 months holding time on sediment samples.				
(3) = Total Metals or field filtered samples only						
(4) = Draft Analytical Method for Determination of Acid Volatile Sulfide in Sediment, EPA 821-R-91-100						
(5) = Plumb, R. H. Jr., <i>Procedures for Handling and Chemical Analysis of Sediment & Water Samples</i> , May 1981, USACE Publication AD/A103788						
(6) = When requested as a separate analyte, TS to correct for dry weight has the same holding time as the analytical parameter						
(7) = VPH & gasoline require only two vials preserved with methanol						
(8) = AK 101 soil/sed will be field preserved using supplied 25ml of methanol including 1.2 ml of surrogate at 50 ug/ml.						
(9) = Amount of sample required for TCLP/ SPLP varies. Lower percent wet solids requires greater sample volume for leaching. If multiple phases are collected each phase may need to be analyzed individually, requiring larger sample volumes.						

For any subcontracted analytical work please consult a project manager for container and sample size specifications.