5. SAMPLE HANDLING PROCEDURES

5.1 SAMPLE CONTAINERS AND PRESERVATION

Required analyses, methods, holding times, preservation, sample quantities, and containers are listed in Tables 5-1 and 5-2.

Table 5-1. Laboratory Analyses, Methods, Holding Times, Preservation, Sample Quantities, and Containers for Sediments

Analysis	Method	Holding Time	Preservation[1/]	Sample Size[2/]	Container
Metals, except arsenic -speciated and mercury	PSEP[4/]/6010B or 7000 Series	6 mo. 2 yr.	4°C -18°C	50 g	4 oz. Glass
Mercury	PSEP[4/]/7471A	28 days	-18°C	50 g	4 oz. Glass
Arsenic - speciated (organic and inorganic)[3/]	EPA 1632 and 1638 (modified)	6 mo. 2 yr.	4°C -18°C	50 g	8 oz. Glass
Total Organic Carbon	PSEP[5/6/]/9060	14 Days 6 mo.	4°C -18°C	25 g	16 oz. Glass
Particle Size	PSEP[5/]	6 Months	4°C	100-200 g	
Total Volatile Solids	PSEP[5/]/160.4 (mod)	14 Days 6 mo.	4°C -18°C	50 g	
Ammonia	PSEP[5/]/Plumb (1981)[7/]	7 Days	4°C	25 g	
Total Sulfides	PSEP[5/]	7 Days	4°C (zinc acetate[11/]), no headspace	50 g	4 oz. Glass

Table 5-1. Laboratory Analyses, Methods, Holding Times, Preservation, Sample Quantities, and Containers for Sediments (Continued)

Analysis	Method	Holding Time	Preservation[1/]	Sample Size[2/]	Container
Acid Volatile Sulfides	PSEP[4/]/EPA (1991)[8/]	14 Days	4°C, no headspace	50 g	4 oz. Glass
Semivolatiles – selected phenols and PAHs and PCBs – selected Aroclors® and congeners	PSEP[9/]/8270C SIM and 8082	14 Days until extraction 1 Year until extraction 40 days until analysis	4°C -18°C 4°C	150 g	16 oz. Glass
Dioxins/furans (17 standard congeners)	1613B	Extract within 1 year, analyze within 1 year [4/]	Cool to 0 °C - 4°C [12/]	50 g	8 oz. amber Glass
Resin Acids, Fatty Acids, and guaiacols – selected analytes	NCASI RA/FA-85.01 (mod)	Extract within 14 days, analyze within 40 days	4°C	150 g	8 oz. Glass
Bioassay	PSEP[10/]	8 Weeks	4°C, nitrogen environment	7 L	7 1-liter Glass

1/ During transport to the laboratory, samples will be stored on ice.
2/ Recommended minimum field sample sizes for one laboratory analysis.
3/ For arsenic speciation, the cited methods do not specify holding times, preservation, or containers for sediment samples.
4/ Recommended Protocols for Measuring Metals in Puget Sound Water, Sediment, and Tissue Samples, Appendix D (PSEP, 1997).
5/ Recommended Protocols for Measuring Conventional Sediment Variables in Puget Sound (PSEP, 1997).
6/ Recommended Protocols for Measuring TOC in Sediments (Kathryn Bragdon-Cook, Clarification Paper, PSDDA Annual Review, May 1993).
7/ Procedures for Handling and Chemical Analysis of Sediment and Water Samples (Russell H. Plumb, Jr., EPA/Corps, May 1981).
8/ Draft Analytical Method for Determination of Acid Volatile Sulfide in Sediment (H.E. Allen et al., EPA-821-R-91-100, August 1991).
9/ Recommended Guidelines for Measuring Organic Compounds in Puget Sound Water, Sediment, and Tissue Samples (PSEP, 1997).
10/ Recommended Guidelines for Conducting Laboratory Bioassays on Puget Sound Sediments (PSEP, Revised 1995).
11/ The sulfides sample will be preserved with 5 ml of 2 normal zinc acetate per 30 g of sediment.
12/ For dioxin/furans, maintain sediment samples in the dark at <4°C from the time of collection until receipt at the laboratory. Upon receipt at the laboratory, sediment samples will be stored in the dark at <-10°C until extraction; at this temperature the holding time from extraction to analysis is 1 year. (Alternatively, if the laboratory stores samples at 0°C to 4°C until extraction, the extraction holding time is 30 days. Likewise, if laboratory stores extracts at 0°C to 4°C until analysis, holding time is 45 days.)

Table 5-2. Laboratory Analyses, Methods, Holding Times, Preservation, Sample Quantities, and Containers for Marine Biota

Analysis	Method	Holding Time	Preservation[1/]	Sample Size[2/]	Container
Metals, except arsenic and mercury	PSEP[4/]/6010B or 7000 Series	2 yr.	-18°C	25 g	Aluminum foil or glass jar
Arsenic – speciated (organic and inorganic)[3/]	EPA 1632 and 1638 (modified)	2 yr.	-18°C	25 g	Aluminum foil or glass jar
Mercury	PSEP/7471A	28 days	-18°C	25 g	Aluminum foil or glass jar
Semivolatiles – selected phenols and PAHs, and Pesticides – selected analytes, and PCBs – selected Aroclors® and congeners	PSEP)[5/]/8270C, 8081A, and 8082	1 Year until extraction 40 days until analysis	-18°C 4°C	60 g (for semivolatiles) 60 g (for pesticides and PCBs) Aroclors® combined) 60 g (for PCB congeners)	Aluminum foil or glass jar
Dioxins/furans (17 standard congeners)	1613B	Extract within 1 year, analyze within 1 year [3/]	< -10°C [6/]	60 g	Aluminum foil or glass jar
Percent Lipid	8290	1 year	-20°C	20 g	Aluminum foil or glass jar

1/ During transport to the lab, samples will be stored on ice or dry ice as discussed in SOPs 10, 11, and 12
2/ Recommended field sample sizes for one laboratory analysis allowing for extraction and reanalysis of every parameter. Actual quantities consumed in the analyses total approximately 90-100 g, excluding PCB congener analysis. The minimum volume to achieve all analyses is therefore approximately 120 g.
3/ For arsenic speciation, the cited methods do not specify holding times, preservation, or containers for marine biota samples.
4/ Recommended Protocols for Measuring Metals in Puget Sound Water, Sediment, and Tissue Samples, Appendix D (PSEP, 1997).
5/ Recommended Guidelines for Measuring Organic Compounds in Puget Sound Water, Sediment, and Tissue Samples (PSEP, 1997).
6/ For dioxin/furans, maintain tissue samples in the dark at <4°C from the time of collection until receipt at the laboratory. Upon receipt at the laboratory, sediment samples will be stored in the dark at <-10°C until extraction; at this temperature the holding time from extraction to analysis is 1 year . Extracts will be stored at <-10° C; the analytical holding time at this temperature is 1 year. (Alternatively, if the laboratory stores extracts at 0°C to 4°C until analysis, the analytical holding time is 45 days.)

5.2 SAMPLE PACKAGING AND SHIPPING

All samples collected will be assigned unique sample numbers, labeled, noted in the site logbook, and recorded on the chain-of-custody form, as discussed in Section 4-8. Labels for sample containers will be filled out completely with all appropriate information. Samples will then be packed for shipment to the laboratory according to the current U.S. Department of Transportation (DOT) and Washington Administrative Code (WAC) 173-303-071(3)(1) requirements. Sample containers will be packed in coolers with a low-density packing material, such as vermiculite, and Blue Ice® (or equivalent). The coolers will be securely sealed.

All samples will be either hand-delivered, couriered, or shipped via express delivery for overnight delivery, if possible, to the contracted laboratory. Custody seals will be used on coolers unless hand-delivered. Protocols and procedures for sample packaging and shipping are detailed in SOP 5, Appendix A.

Upon receipt at the laboratory, the custody seal will be broken, and the receiver will record the condition of the samples. The chain-of-custody form will be signed. Custody forms will be used internally in the laboratory to track sample handling and final disposition.