

	Port Allen, Louisiana Standard Operating Procedure	Containers, Preservation, Storage, & Holding Times
		PALA-SR-001-TB-01 r 01.0
		Effective 08/30/2019
		Page 1 of 5

Sample Integrity

ARS Aleut Analytical is committed to maintaining the integrity of all samples submitted for laboratory analyses. ARS has a set criterion that all samples must pass in order to be considered to be of satisfactory condition. The Sample Receiving Department and/or Project Managers will notify the client of any samples that may be considered to be of unsatisfactory condition. Analysis of unsatisfactory samples will be conducted only with the written authorization from the client.

Collection of Samples in Duplicate

The collection of a sample in duplicate is requested when submitting a series of five or more samples per Chain of Custody. Collecting double the volume of a sample will enable us to perform additional quality control procedures in the laboratory. This practice may also be utilized when submitting samples for a project requiring additional quality control information.

Cooling of Samples

Samples requiring thermal preservation must be chilled to <6°C immediately following collection and packed with a sufficient amount of ice to maintain that temperature until receipt at laboratory facility. “Wet Ice” is the preferred means of cooling samples as the use of icepacks or ice substitutes (blue ice) are generally unable to maintain a cold enough temperature during shipments. Where “Cool <6°C” is stated, samples are not to be frozen. It is preferable for temperature blanks to be included in each sample cooler, but not required.

Laboratories are required to maintain a record of sample temperature as received. ARS Aleut Analytical uses hand held infrared thermometers to monitor sample temperature upon receipt. A notation of the temperature is made on the Sample Receipt Inspection Form. Samples received on ice will be noted as such and include the type of ice (Wet Ice or Ice Packs).

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	Port Allen, Louisiana Standard Operating Procedure		Containers, Preservation, Storage, & Holding Times
			PALA-SR-001-TB-01 r 01.0
			Effective 08/30/2019
			Page 2 of 5

Part 1: Water and Wastewater

Recommended Containers, Preservation, Storage, & Holding Times for Water and Wastewater						
Description	Method	Matrix	Sample Container ¹	Preservative ²	Prep/Analysis Holding Time	Volume
Volatile/Semi Volatile Analyses						
GCMS-Purgeables	624, 624.1, 8260C	H ₂ O	G (b) Tef Sep	Cool ≤6°C, HCl to pH<2 ^{2,5}	14 days ⁵	40 ml ^{4,12}
GCMS-Acrolein, Acrylonitrile, 2-Chloroethylvinyl ether	624, 624.1	H ₂ O	G (b) Tef Sep	Cool ≤6°C ²	3 days ¹³	40 ml ^{4,12}
Methyl tert-butyl ether (MTBE)	624, 624.1	H ₂ O	G (b) Tef Sep	Cool ≤6°C	7 days	40 ml ^{4,12}
GC- PCBs	608, 8082A	H ₂ O	AG (a) Tef Cap	Cool ≤6°C ^{2, 14}	1yr/1yr ¹⁶	1L ^{3,4}
GC/MS-Semivolatiles – PAHs Base Neutral/Acid Extractable	625, 8270D	H ₂ O	AG (a) Tef Cap	Cool ≤6°C ^{2, 14}	7/40 days ⁶	1L ^{3,4}
Metals Analyses						
ICP/ICPMS Metals except Boron, Silica	200.7/200.8 6010C/6020A	H ₂ O	P or G (c)	Cool ≤6°C, HNO ₃ to pH<2 ⁸	No acid - 14 Days acid - 6 months	250 mL
Boron, Silica as SiO ₂ /Silicon	200.7/6010C	H ₂ O	P (c)	Cool ≤6°C, HNO ₃ to pH<2 ⁸	No acid - 14 Days acid - 6 months	250 mL
Mercury	245.1/7470A	H ₂ O	P or G (c)	Cool ≤6°C, HNO ₃ to pH<2 ⁸	28 days	250 mL
Inorganic/General Chemistry						
Ion Chromatography Anions	300.0	H ₂ O	P or G	Cool ≤6°C	28 days ¹⁰	500 mL
Nitrate, Nitrite, Orthophosphate	300.0	H ₂ O	P or G	Cool ≤6°C	48 hours	500 mL
Combined NO ₂ +NO ₃	300.0	H ₂ O	P or G	H ₂ SO ₄ to pH<2	28 days	500 mL
pH	150.1	H ₂ O	P or G	Cool ≤6°C	Immediate (15 min from collect)	125 mL

	Port Allen, Louisiana Standard Operating Procedure	Containers, Preservation, Storage, & Holding Times
		PALA-SR-001-TB-01 r 01.0
		Effective 08/30/2019
		Page 3 of 5

Recommended Containers, Preservation, Storage, & Holding Times for Water and Wastewater

Notes:

- 1 G (x) = glass; AG (x) = amber glass; P (x) = plastic; Tef Sep = Teflon septum; Tef Cap = Teflon lined cap; x = cleaning protocol as follows: a = acid wash + solvent wash + oven dry; b = oven dry; c = acid wash.
- 2 For organics and bacteriological analysis, sodium thiosulfate is required for all chlorinated waters. If analytes that are gases at room temperature (such as vinyl chloride) are to be determined, sodium thiosulfate is recommended to reduce the residual chlorine when testing using method 524.2. For cyanide, use 0.6g ascorbic acid. Dechlorination must be performed prior to the addition of any necessary preservative.
- 3 Samples must be provided in duplicate to cover for breakage and provide sufficient sample for QC procedures. Extractable organics with matrix spike/matrix spike duplicate QC protocols require a triplicate sample.
- 4 Fill completely to avoid volatile loss.
- 5 Samples with purgeable aromatics must be acidified with HCl to pH<2 in order to have a 14-day holding time. If unpreserved, the hold time is 7 days.
- 6 Holding time is seven days from sample collection date for extraction, 40 days from extraction date for analysis of the extract. Holding time is fourteen days for extraction if listed as 14/40.
- 7 The EPA has not recommended petroleum hydrocarbon holding times. The holding time given is the laboratory practice by analogy with Oil and Grease standards. State of New Jersey holding time is 7 days. California LUFT is 14 days.
- 8 An aqueous sample may be collected and shipped without acid preservation. However, acid must be added at least 24 hours before analysis of wastewater samples to dissolve any metals that adsorb to the container walls per footnote 19 for Table II of 40 CFR 136. If the sample must be analyzed within 24 hours of collection, add the acid immediately. For the determination of dissolved elements in accordance with 40 CFR 136.3, the sample must be filtered through a 0.45 µm pore diameter membrane filter within 15 minutes of collection and before adding preservative. If shipped unpreserved, the samples must be thermally preserved by cooling (≤6°C). Cooling is not required if samples are acid preserved.
- 9 The EPA allows only 14 days holding time for mercury in plastic bottles for drinking water analysis.
- 10 Certain anions require special handling. Holding times and preservation for a particular sample will be determined by the requirement for the anion of interest with the shortest holding time; e.g., nitrate and nitrite - 48 hours; orthophosphate-filter and 48 hours.
- 11 The immediate filtration requirement in orthophosphate measurement is to assess the dissolved or bio-available form of orthophosphorus (i.e., that which passes through a 0.45-micron filter), hence the requirement to filter the sample immediately upon collection (i.e., within 15 minutes of collection).
- 12 Samples must be provided in triplicate to cover for breakage and provide sufficient sample for screening and QC procedures.
- 13 Analysis of an unpreserved sample for Acrolein must occur within 3 days of collection. Analysis of a preserved sample for Acrolein and Acrylonitrile will require a preservation to pH 4-5. The pH adjustment is not required if acrolein will not be measured. It is the client's responsibility to request appropriate containers and notify the lab when analyzing for Acrolein and Acrylonitrile by 624.
- 14 Samples with a pH outside of 5.0-9.0 range should be adjusted to a pH range of 5.0-9.0 with sodium hydroxide solution or sulfuric acid within 72 hours of collection.
- 15 Separate bottle filled completely to the exclusion of air.
- 16 Holding time is 1 year from sample collection date for extraction, 1 year from extraction date for analysis of the extract except for samples analyzed under State of Connecticut RCP requirements stipulate holding time is seven days from sample collection date for extraction, 40 days from extraction date for analysis of the extract for method 8082.
- 17 Analyze samples as soon as possible after collection. Drinking water samples should be analyzed within 30 h of collection. Do not hold source water samples longer than 6 h between collection and initiation of analyses, and the analyses should be complete within 8h of sample collection.

	Port Allen, Louisiana Standard Operating Procedure		Containers, Preservation, Storage, & Holding Times
			PALA-SR-001-TB-01 r 01.0
			Effective 08/30/2019
			Page 4 of 5

Part 2: Soil, Solids, and Wastes

Recommended Containers, Preservation, Storage, & Holding Times For Soil, Solids, and Wastes

Description	Method	Matrix	Sample Container ¹	Preservative	Prep/Analysis Holding Time	Volume
Volatile/Semi-volatile Analyses						
GC- PCBs	8082A	Soil/Waste	AG (a) Tef Cap	Cool ≤6°C	1yr/40 days ⁹	100 g or 8 oz Jar
GCMS- Purgeables	8260C	Soil/Waste	AG (a) Tef Cap	Cool ≤6°C	14 Days	2 x 4 oz Jar
GC/MS-Semivolatiles – PAHs Base Neutral/Acid Extractable	8270D	Soil/Waste	AG (a) Tef Cap	Cool ≤6°C	14/40 days ³	100 g or 8 oz Jar
Metals Analyses						
ICP/ICPMS Metals	200.7/6010C/ 6020B	Soil	P or G (c)	Cool ≤6°C	6 months	100 g or 8 oz Jar
Mercury	7471B	Soil	P or G (c)	Cool ≤6°C	28 days	100 g or 8 oz Jar
General Inorganic Analyses						
General Inorganics	9000 Series	Soil	P or G (c) ⁵	Cool ≤6°C	Not to exceed Part 1 Specifications	100 g or 8 oz Jar
pH/Corrosivity	9045D	Soil/Waste	P or G (c)	Cool ≤6°C	ASAP 15 minutes	100 g or 2 oz Jar ²
TCLP/SPLP	1311/1312	Soil/Waste	Inorganics - P or G (c) or (a) Organics - G (a)	Cool ≤6°C if appropriate	varies by method	500 g or 32oz Jar ^{2,8}

- Notes:
- 1 G (x) = glass; AG (x) = amber glass; P (x) = plastic; Tef Sep = Teflon septum; Tef Cap = Teflon lined cap; x = cleaning protocol as follows: a = acid wash + solvent wash + oven dry; b = oven dry; c = acid wash.
 - 2 Fill completely to avoid volatile loss; if pre-weighted VOA vials are used, sample cannot exceed half volume of the vial.
 - 3 Holding time is fourteen days from sample collection date for extraction, 40 days from extraction date for analysis of extract.
 - 4 EPA has not recommended oil and grease, petroleum hydrocarbons or EDB holding times in soil. The holding time is given by analogy to extractable organics.
 - 5 Acid washed containers are not appropriate for nitrate and other N analysis. Use glass container ordered with cleaning protocol (1-Chem V220-0250, or equivalent).
 - 6 Fill completely to avoid volatile loss. If vials are used, a minimum of 4 is required. 7
 - 7 Holding time is not to exceed 14 days. If sulfide reactivity is sought, then not to exceed 7 days.
 - 8 TCLP samples with liquid require more sample volume. For example, a sample with 10% solids requires a minimum of 2000g. Aqueous samples should routinely be provided as 3 liters in order to cover for breakage and provide sufficient sample for laboratory QC.
 - 9 Holding time is 1 year from sample collection date for extraction, 40 days from extraction date for analysis of the extract except for samples analyzed under State of Connecticut RCP requirements stipulate holding time is fourteen days from sample collection date for extraction, 40 days from extraction date for analysis of the extract for method 8082.
 - 10 In order to be compliant with method requirements for hexavalent chromium in soil, the laboratory will also analyze and report pH and ORP. Testing for pH and ORP should be conducted ASAP. MA CAM and CT RCP protocols specify a maximum holding time of 24 hours for ORP.

Part 3: RadioChemistry Samples

Recommended Containers, Preservation, Storage, & Holding Times For Rad Chem Waters, Solids, and Wastes						
Description	Method	Matrix	Sample Container ¹	Preservative	Prep/Analysis Recommended Holding Time	Volume
Radiochemistry (all analyses except Tritium, C-14, Radon, I-129 and I-131)	all analyses except Tritium, C-14, Radon, I-129 and I-131	H ₂ O	P or G	pH<2	6 months	1 L per analyte group
Radon in Water	910.0	H ₂ O	40 mL VOA vial without head space	None	½ life reached ~80 hours after collection	3 x 40 ml
Iodine-131	901.1	H ₂ O	P or G	None	½ life reached 8 days after collection	1L
C-14	ARS-019	H ₂ O	P or G	None	6 months	1L
Gross Alpha by GPC	EPA 900.0	H ₂ O	P	pH<2, preserve at lab with HNO ₃ Wait 24 hours after preservation	6 months	1L
Gross Alpha High TDS (coprecipitation-GPC)	SM 7110C	H ₂ O	P	pH<2, preserve at lab with HNO ₃ Wait 24 hours after preservation	6 months	1L
Gross Beta - GPC	EPA 900.0	H ₂ O	P	pH<2, preserve at lab with HNO ₃ Wait 24 hours after preservation	6 months	1L
Radium-226	EPA 903.0 EPA 903.1	H ₂ O	P	HNO ₃ to pH<2	6 months	1L
Radium-228	EPA 904.0	H ₂ O	P	HNO ₃ to pH<2	6 months	1L
Strontium-90	EPA 905.0-M ARS-032 Eichrom-SKW01	H ₂ O	P	HNO ₃ to pH<2	6 months	1L
Tritium (LSC)	EPA 906.0	H ₂ O	P or G	None	6 months	250 mL
Radiochemistry	multiple	Soil	P or G	None	6 months	16 oz
Radiochemistry	multiple	BT	P or G	Frozen	6 months	N/A
Radiochemistry	multiple	Air	P or G	None	6 months	N/A