TARGET REPORTING LIMITS FOR CONVENTIONAL WATER QUALITY CONSTITUENTS

Analysis	Matrix	Reporting Units	*Suggested Analytical Methods (See *Note, and see References 1-13, at bottom of table)	Target Reporting Limit (TRL)
CONVENTIONAL CONSTITUENTS				
AMMONIA (as N)	water (dissolved)	mg/L	EPA 350.3 EPA 350.2 SM 4500-NH_3 B, C	0.1
BIOCHEMICAL OXYGEN DEMAND	water	mg/L	EPA 405.1 SM 5210B	2
BORON	water (dissolved)	mg/L	EPA 200.7 EPA 6010A SM 4500 B-19	0.010 (500 ml filtration)
CALCIUM	water (dissolved)	mg/L	EPA 200.7 EPA 6010A SM 3111B	0.05
CHLORIDE (iodometric)	water (dissolved)	mg/L	EPA 300.0A SM 4500 Cl C	0.25
CHLOROPHYLL a PHEOPHYTIN a	water (dissolved)	µg/L	SM 10200H	2.0 (500ml filtration)
CHEMICAL OXYGEN DEMAND (titrametric)	water	mg/L	EPA 410.1-.4	5
CONDUCTIVITY	water	µS/cm	SM 2510B EPA 120.1	2.5
FIXED & VOLATILE DISSOLVED SOLIDS (500 C)	water	mg/L	EPA 160.4 SM 2540E	5.0
FLUORIDE	water (dissolved)	mg/L	EPA 300.0A EPA 6010A	0.123
IRON	water (dissolved)	mg/L	EPA 300.0A EPA 6010A	0.02
MAGNESIUM	water (dissolved)	mg/L	EPA 200.7 EPA 6010A SM 3111B	0.02
MANGANESE	water (dissolved)	mg/L	EPA 200.7 EPA 6010A SM 3111B	0.02
NITRATE (as N)	water (dissolved)	mg/L	EPA 300.0A EPA 353.3 SM 4500-NO_3 E, F (Flow injection analysis)	0.01
NITRATE+NITRITE	water	mg/L	EPA 353.2 SM 4500-NO_3 E, F	0.1
NITRITE (as N)	water (dissolved)	mg/L	EPA 300.0A EPA 353.2 SM 4500-NO_2 B (Flow injection analysis)	0.01

TARGET REPORTING LIMITS FOR CONVENTIONAL WATER QUALITY CONSTITUENTS

Analysis	Matrix	Reporting Units	*Suggested Analytical Methods (See *Note, and see References 1-13, at bottom of table)	Target Reporting Limit (TRL)
CONVENTIONAL CONSTITUENTS				
OIL AND GREASE (HEM)	water	mg/L	EPA 1664A SM 5520 B	1.4
ORGANIC CARBON	water (dissolved)	mg/L	EPA 415.1-.2 SM 5310 C	0.6
	water (total)	mg/L	EPA 415.1-.2 SM 5310C	0.6
ORTHO-PHOSPHATE (as P)	water (dissolved)	mg/L	EPA 300.0A EPA 365.3 SM 4500-P E&F (Flow injection analysis)	0.01
PATHOGENS				
E. Coli	water	MPN/100 ml	SM 9221B/E mod. MUG, SM 9223B	2
Enterococcus	water	colonies/100 ml	SM 9230C, ASTM D6503	1
Fecal Coliform	water	MPN/100 ml	SM 9221E, SM 9222D (25-tube dilution)	2
Total Coliform	water	MPN/100 ml	SM 9221B, SM 9222B (25-tube dilution)	2
POTASSIUM	water (dissolved)	mg/L	EPA 200.7 EPA 6010A SM 3111B SM 3500-K D	0.1
SEDIMENT GRAIN SIZE ANALYSIS	sediment (4-fraction)	% gravel % sand % silt % clay	(6), (7) ASTM (sieve-hydrometer) (8) Plumb 1981, (9) EPA 1995 (abbrev. pipette)	1%
	sediment (full phi analysis)	g (grams-weight)	(8) Plumb 1981, (9) EPA 1995, (10) Folk 1980 (full phi pippette analysis)	Particle Size <0.002 mm >0.002 mm >0.0039 mm >0.0078 mm >0.0313 mm >0.0625 mm >0.125 mm >0.25 mm >0.5 mm >1 mm >2 mm >3.2 mm >4 mm >8 mm

TARGET REPORTING LIMITS FOR CONVENTIONAL WATER QUALITY CONSTITUENTS

Analysis	Matrix	Reporting Units	*Suggested Analytical Methods (See *Note, and see References 1-13, at bottom of table)	Target Reporting Limit (TRL)
CONVENTIONAL CONSTITUENTS				
SEDIMENT TOTAL ORGANIC CARBON	sediment	%OC (dry weight)	EPA 9060, and (13) EPA 1986 (Kahn Method)	0.01
SILICA	water (dissolved)	mg/L	EPA 200.7 SM 3111B	0.1
SODIUM	water (dissolved)	mg/L	EPA 200.7 EPA 6010A SM 3111B	0.1
SULFATE	water (dissolved)	mg/L	EPA 300.0A SM 4500-SO_4, E ASTM D516	1.0
SUSPENDED SEDIMENT CONCENTRATION	water	mg/L	(11) ASTM 2000 D3977 (12) Gray et al 2000	0.5
TOTAL ALKALINITY (as CaCO3)	water	mg/L	EPA 310.1-2 SM 2320B	1
TOTAL DISSOLVED SOLIDS	water	mg/L	EPA 160.1 SM 2540C	10
TOTAL HARDNESS (as CaCO3)	water	mg/L	EPA 200.7 EPA 130.1-2 SM 2340C	1
TOTAL KJELDAHL NITROGEN	water	mg/L	EPA 351.1-.4 4500-N_{org} B, C SM 4500-NH_3 C, E, F	0.5
TOTAL PHOSPHATE (as P)	water	mg/L	EPA 365.1-4 SM 4500-P B(5), E&F	0.05
TOTAL SUSPENDED SOLIDS (103-105 C)	water	mg/L	EPA 160.2 SM 2540D APHA 1997	0.5
TURBIDITY	water	NTU	EPA 180.1 SM 2130B	0.5 ntu
VOLATILE SUSPENDED SOLIDS	water	mg/L	EPA 160.4 SM 2540E	1.0

*NOTE REGARDING SUGGESTED METHODS LISTED ABOVE

All analytical methods listed above are suggested. Other methods may be employed, and modifications of standard methods are encouraged, as long as the methods used: 1) meet the sensitivity requirements of the TRL's, and 2) are contained in 40CFR36, the most current version of Standard Methods, or another reliable procedure as documented to produce results that are equal to or more stringent than the method being modified (modifications made according to CFR (Title 40, Part 136.4).

Any changes in procedures due to equipment changes or to improved precision and accuracy will be documented. Analyses and determinations must be performed by qualified personnel in conformance with the United States Environmental Protection Agency

(EPA) or DHS approved test procedures described in the current Code of Federal Regulations (CFR) (Title 40, Part 136); "Test Methods for Evaluating Solid Waste," SW-846; or Title 22, CFR, Article 11, as appropriate. The test procedures may be modified subject to the application and approval of alternate test procedures under the CFR (Title 40, Part 136.4). The SWAMP Program strongly encourages the use of "performance-based methodology" (PBM) for conducting analytical procedures and therefore recognized the use of modified standard procedures, as appropriately documented following CFR 40, Part 136.4. The use of PBM allows for approved procedures to be modified according to these guidelines, which provide results that are equal to or better than (more stringent than) the standard protocol that was modified.

REFERENCES

1. US EPA. Methods for Chemical Analysis of Water and Waste, revised March 1983.

2. US EPA. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993 EPA/600/R-93/100.

3. US EPA. Methods for the Determination of Metals in Environmental Samples, Supplement 1, May 1994 EPA/600/R-94/111.

4. US EPA. Test methods for Evaluating Solid Waste. SW846 3rd edition. Update III (1997).

5. American Public Health Association, et al. Standard Methods for the Examination of Water and Wastewater. 19th Edition, 1997.

6. ASTM D-422, 1963. Particle Size Analysis of Soils. American Society for Testing and Materials.

7. ASTM D-2216, 1980. Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures. American Society for Testing and Materials.

8. U.S. EPA, 1995. Environmental Monitoring and Assessment Program (EMAP): Laboratory Methods Manual – Estuaries, Volume 1: Biological and Physical Analyses. United States Environmental Protection Agency, Office of Research and Development, Narragansett, RI. EPA/620/R-95/008.

9. Plumb, R. H., 1981. Procedure for Handling and Chemical Analysis of Sediment and Water Samples. Technical Report EPA/CE 81-1, prepared for Great Lakes Laboratory, State University College at Buffalo, NY, for the U.S. EPA/Corps of Engineers Technical Committee on Criteria for Dredged and Fill Material. U.S. Army Engineers Waterways Experiment Station, CE, Vicksburg, MS.

10. Folk, R.L., 1980. Petrology of Sedimentary Rocks. Hemphill Publishing Company, Austin, TX.

11. American Society for Testing and Materials (ASTM), 2000, Standard test methods for determining sediment concentration in water samples: D3977-97, vol. 11.02, Water (II), 395-400.

12. Gray, JR, Glysson, GD, Turcios, LM, and Schwarz, GE., 2000, Comparability of suspended-sediment concentration and total suspended solids data: USGS Water-Resources Investigations Report 00-4191.

13. EPA Region II, 1986. Determination of Total Organic Carbon in Sediment (Kahn Method).