

APPENDIX B

EPA Methods of Environmental Water Analysis

Table B-1. Inorganic constituents of concern in water samples, the analytical methods used to determine their concentrations, and their contractual reporting limits.

Constituent of concern	Analytical method	Reporting limit ^(a,b)	
Metals and minerals (mg/L)	All alkalinities	SM 2310	1
	Aluminum	EPA 200.7 or 200.8	0.05 or 0.2
	Ammonia nitrogen (as N)	EPA 350.1 or SM 4500-NH3	0.03 or 0.1
	Antimony	EPA 204.2 or 200.8	0.005
	Arsenic	EPA 206.2 or 200.8	0.002
	Barium	EPA 200.7 or 200.8	0.025 or 0.01
	Beryllium	EPA 210.2 or 200.8	0.0005 or 0.0002
	Boron	EPA 200.7	0.05
	Bromide	EPA 300.0	0.5
	Cadmium	EPA 200.8 or SM 3113B	0.0005
	Calcium	EPA 200.7	0.5
	Chloride	EPA 300.0	1 or 0.5
	Chlorine (residual)	SM-4500-CL	0.1
	Chromium	EPA 218.2 or 200.8	0.01 or 0.001
	Chromium(VI)	EPA 218.4 or 7196	0.002
	Cobalt	EPA 200.7 or 200.8	0.025 or 0.05
	Copper	EPA 220.2, 200.7 or 200.8	0.001, 0.01 or 0.05
	Cyanide	EPA 335.2 or 4500-CN	0.02
	Fluoride	EPA 340.2 or 340.1	0.05
	Hardness, total (as CaCO ₃)	SM 2320B	1
	Iron	EPA 200.7 or 200.8	0.1
	Lead	EPA 200.8 or SM3113B	0.002 or 0.005
	Magnesium	EPA 200.7 or 200.8	0.5
	Manganese	EPA 200.7 or 200.8	0.03
	Mercury	EPA 245.2 or 245.1	0.0002
	Molybdenum	EPA 200.7 or 200.8	0.025
	Nickel	EPA 200.7, 200.8 or SM 3113B	0.002, 0.005 or 0.1
	Nitrate (as NO ₃)	EPA 353.2 300.0 or SM 4500-NO ₃	0.5
	Nitrite (as NO ₂)	EPA 353.2 or 300.0, SM 4500-NO ₂	0.5
	Ortho-phosphate	EPA 300.0 or SM4500	0.05
	Perchlorate	EPA 314.0	0.004
	Potassium	EPA 200.7	1
	Selenium	EPA 200.8 or SM 3113B	0.002
	Silver	EPA 200.8 or SM 3113B	0.001 or 0.0005
Sodium	EPA 200.7	1 or 0.1	
Sulfate	EPA 300.0	1	
Surfactants	SM 5540C or EPA 425.1	0.5	
Thallium	EPA 279.2 or 200.8	0.001	

B. EPA Methods of Environmental Water Analysis

Table B-1 (cont.). Inorganic constituents of concern in water samples, the analytical methods used to determine their concentrations, and their contractual reporting limits.

Constituent of concern	Analytical method	Reporting limit ^(a,b)	
Metals and minerals (mg/L) (cont.)	Total dissolved solids	SM 2540C	1
	Total suspended solids	SM 2540D	1
	Total Kjeldahl nitrogen (as N)	EPA 351.2 or SM 4500-Norg	0.2
	Total phosphorus (as P)	EPA 365.4 or SM 4500-P	0.05
	Vanadium	EPA 200.7 or 200.8	0.02 or 0.025
	Zinc	EPA 200.7 or 200.8	0.02 or 0.05
General indicator parameters	pH (pH units)	SM 4500-H+	none
	Biochemical oxygen demand (mg/L)	SM 5210B	2
	Conductivity (µS/cm)	EPA 120.1	none
	Chemical oxygen demand (mg/L)	EPA 410.4	5
	Dissolved oxygen (mg/L)	SM 4500-O G	0.05
	Total organic carbon (mg/L)	EPA 9060 or SM 5310B	1
	Total organic halides (mg/L)	EPA 9020	0.02
	Toxicity, acute (fathead minnow)	EPA 600/4-AB5-013	NA
	Toxicity, chronic (fathead minnow)	EPA 1000	NA
	Toxicity, chronic (daphnid)	EPA 1002	NA
Toxicity, chronic (green algae)	EPA 1003	NA	
Radioactivity (Bq/L)	Gross alpha	EPA 900	0.074
	Gross beta	EPA 900	0.11
Radioisotopes (Bq/L)	Americium-241	U-NAS-NS-3050	0.0037
	Plutonium-238	U-NAS-NS-3050	0.0037
	Plutonium-239+240	U-NAS-NS-3050	0.0037
	Radon-222	EPA 913	3.7
	Radium-226	EPA 903	0.0093
	Radium-228	EPA 904	0.037
	Thorium-228	U-NAS-NS-3050	0.009
	Thorium-230	U-NAS-NS-3050	0.006
	Thorium-232	U-NAS-NS-3050	0.006
	Tritium	EPA 906	3.7
	Uranium-234	EPA 907	0.0037
	Uranium-235	EPA 907	0.0037
	Uranium-238	EPA 907	0.0037

(a) The number of decimal places displayed in this table vary by constituent. These variations reflect regulatory agency permit stipulations, or the applicable analytical laboratory contract under which the work was performed, or both.

(b) These reporting limits are for water samples with low concentrations of dissolved solids. If higher concentrations are present, limits are likely to be higher.

B. EPA Methods of Environmental Water Analysis

Table B-2. Organic constituents of concern in water samples and their contractual reporting limits of concentration, sorted by analytical method.

Constituent of concern	Reporting limit (µg/L) ^(a,b)	Constituent of concern	Reporting limit (µg/L) ^(a,b)
EPA Method 1664		Dibromochloromethane	0.2
Oil & Grease	1000	Dibromomethane	0.2
EPA Method 420.1		Dichlorodifluoromethane	0.2
Phenolics	5	Ethylbenzene	0.2
EPA Method 502.2		Freon 113	0.2
1,1,1,2-Tetrachloroethane	0.2	Hexachlorobutadiene	0.2
1,1,1-Trichloroethane	0.2	Isopropylbenzene	0.2
1,1,2,2-Tetrachloroethane	0.2	<i>m</i> - and <i>p</i> -Xylene isomers	0.2
1,1,2-Trichloroethane	0.2	Methylene chloride	0.2
1,1-Dichloroethane	0.2	<i>n</i> -Butylbenzene	0.2
1,1-Dichloroethene	0.2	<i>n</i> -Propylbenzene	0.2
1,1-Dichloropropene	0.2	Naphthalene	0.2
1,2,3-Trichlorobenzene	0.2	<i>o</i> -Xylene	0.2
1,2,3-Trichloropropane	0.2	Isopropyl toluene	0.2
1,2,4-Trichlorobenzene	0.2	<i>sec</i> -Butylbenzene	0.2
1,2,4-Trimethylbenzene	0.2	Styrene	0.2
1,2-Dichlorobenzene	0.2	<i>tert</i> -Butylbenzene	0.2
1,2-Dichloroethane	0.2	Tetrachloroethene	0.2
1,2-Dichloropropane	0.2	Toluene	0.2
1,3,5-Trimethylbenzene	0.2	<i>trans</i> -1,2-Dichloroethene	0.2
1,3-Dichlorobenzene	0.2	<i>trans</i> -1,3-Dichloropropene	0.2
1,3-Dichloropropane	0.2	Trichloroethene	0.2
1,4-Dichlorobenzene	0.2	Trichlorofluoromethane	0.2
2,2-Dichloropropane	0.2	Vinyl chloride	0.2
2-Chlorotoluene	0.2	EPA Method 507	
4-Chlorotoluene	0.2	Alachlor	0.5
Benzene	0.2	Atraton	0.5
Bromobenzene	0.2	Atrazine	0.5
Bromochloromethane	0.2	Bromacil	0.5
Bromodichloromethane	0.2	Butachlor	0.5
Bromoform	0.2	Diazinon	0.5
Bromomethane	0.2	Dichlorvos	0.5
Carbon tetrachloride	0.2	Ethoprop	0.5
Chlorobenzene	0.2	Merphos	0.5
Chloroethane	0.2	Metolachlor	0.5
Chloroform	0.2	Metribuzin	0.5
Chloromethane	0.2	Mevinphos	0.5
<i>cis</i> -1,2-Dichloroethene	0.2	Molinate	0.5
<i>cis</i> -1,3-Dichloropropene	0.5	Prometon	0.5

B. EPA Methods of Environmental Water Analysis

Table B-2 (cont.). Organic constituents of concern in water samples and their contractual reporting limits of concentration, sorted by analytical method.

Constituent of concern	Reporting limit (µg/L) ^(a,b)	Constituent of concern	Reporting limit (µg/L) ^(a,b)
EPA Method 507 (cont.)		EPA Method 608	
Prometryn	0.5	Aldrin	0.05
Simazine	0.5	BHC, alpha isomer	0.05
Terbutryn	0.5	BHC, beta isomer	0.05
EPA Method 547		BHC, delta isomer	0.05
Glyphosate	20	BHC, gamma isomer (Lindane)	0.05
EPA Method 601		Chlordane	0.2
1,1,1-Trichloroethane	0.5	Dieldrin	0.1
1,1,1,2-Tetrachloroethane	0.5	Endosulfan I	0.05
1,1,2-Trichloroethane	0.5	Endosulfan II	0.1
1,1-Dichloroethane	0.5	Endosulfan sulfate	0.1
1,1-Dichloroethene	0.5	Endrin	0.1
1,2-Dichlorobenzene	0.5	Endrin aldehyde	0.1
1,2-Dichloroethane	0.5	Heptachlor	0.05
1,2-Dichloroethene (total)	0.5	Heptachlor epoxide	0.05
1,2-Dichloropropane	0.5	Methoxychlor	0.5
1,3-Dichlorobenzene	0.5	4,4'-DDD	0.1
1,4-Dichlorobenzene	0.5	4,4'-DDE	0.1
2-Chloroethylvinylether	0.5	4,4'-DDT	0.1
Bromodichloromethane	0.5	Toxaphene	1
Bromoform	0.5	EPA Method 615	
Bromomethane	0.5	2,4,5-T	0.5
Carbon tetrachloride	0.5	2,4,5-TP (Silvex)	0.2
Chlorobenzene	0.5	2,4-D	1
Chloroethane	0.5	2,4-Dichlorophenoxy acetic acid	2
Chloroform	0.5	Dalapon	10
Chloromethane	0.5	Dicamba	1
<i>cis</i> -1,2-Dichloroethene	0.5	Dichloroprop	2
<i>cis</i> -1,3-Dichloropropene	0.5	Dinoseb	1
Dibromochloromethane	0.5	MCPA	250
Dichlorodifluoromethane	0.5	MCPP	250
Freon-113	0.5	EPA Method 624	
Methylene chloride	0.5	1,1,1-Trichloroethane	1
Tetrachloroethene <i>trans</i> -1,2-	0.5	1,1,2,2-Tetrachloroethane	1
Dichloroethene <i>trans</i> -1,3-	0.5	1,1,2-Trichloroethane	1
Dichloropropene	0.5	1,1-Dichloroethane	1
Trichloroethene	0.5	1,1-Dichloroethene	1
Trichlorofluoromethane	0.5	1,2-Dichlorobenzene	1
Vinyl chloride	0.5	1,2-Dichloroethane	1

B. EPA Methods of Environmental Water Analysis

Table B-2 (cont.). Organic constituents of concern in water samples and their contractual reporting limits of concentration, sorted by analytical method.

Constituent of concern	Reporting limit (µg/L) ^(a,b)	Constituent of concern	Reporting limit (µg/L) ^(a,b)
EPA Method 624 (cont)		EPA Method 625	
1,2-Dichloroethene (total)	1	1,2,4-Trichlorobenzene	5
1,2-Dichloropropane	1	1,2-Dichlorobenzene	5
1,3-Dichlorobenzene	1	1,3-Dichlorobenzene	5
1,4-Dichlorobenzene	1	1,4-Dichlorobenzene	5
2-Butanone	20	2,4,5-Trichlorophenol	5
2-Chloroethylvinylether	20	2,4,6-Trichlorophenol	5
2-Hexanone	20	2,4-Dichlorophenol	5
4-Methyl-2-pentanone	20	2,4-Dimethylphenol	5
Acetone	10	2,4-Dinitrophenol	25
Benzene	1	2,4-Dinitrotoluene	5
Bromodichloromethane	1	2,6-Dinitrotoluene	5
Bromoform	1	2-Chloronaphthalene	5
Bromomethane	2	2-Chlorophenol	5
Carbon disulfide	1	2-Methylphenol	5
Carbon tetrachloride	1	2-Methyl-4,6-dinitrophenol	25
Chlorobenzene	1	2-Methylnaphthalene	5
Chloroethane	2	2-Nitroaniline	25
Chloroform	1	3,3'-Dichlorobenzidine	10
Chloromethane	2	3-Nitroaniline	25
<i>cis</i> -1,2-Dichloroethene	1	4-Bromophenylphenylether	5
<i>cis</i> -1,3-Dichloropropene	1	4-Chloro-3-methylphenol	10
Dibromochloromethane	1	4-Chloroaniline	10
Dibromomethane	1	4-Chlorophenylphenylether	5
Dichlorodifluoromethane	2	4-Nitroaniline	25
Ethylbenzene	1	4-Nitrophenol	25
Freon 113	1	Acenaphthene	25
Methylene chloride	1	Acenaphthylene	5
Styrene	1	Anthracene	5
Tetrachloroethene	1	Benzo[<i>a</i>]anthracene	5
Toluene	1	Benzo[<i>a</i>]pyrene	5
Total xylene isomers	2	Benzo[<i>b</i>]fluoranthene	5
<i>trans</i> -1,2-Dichloroethene	1	Benzo[<i>g,h,i</i>]perylene	5
<i>trans</i> -1,3-Dichloropropene	1	Benzo[<i>k</i>]fluoranthene	5
Trichloroethene	0.5	Benzoic acid	25
Trichlorofluoromethane	1	Benzyl alcohol	10
Vinyl acetate	1	Bis(2-chloroethoxy)methane	5
Vinyl chloride	1	Bis(2-chloroisopropyl)ether	5

B. EPA Methods of Environmental Water Analysis

Table B-2 (cont.). Organic constituents of concern in water samples and their contractual reporting limits of concentration, sorted by analytical method.

Constituent of concern	Reporting limit (µg/L) ^(a,b)	Constituent of concern	Reporting limit (µg/L) ^(a,b)
EPA Method 625 (cont)		Naled	1
Bis(2-ethylhexyl)phthalate	5	Phorate	1
Butylbenzylphthalate	5	Prothiophos	1
Chrysene	5	Ronnel	1
Di- <i>n</i> -butylphthalate	5	Stirophos	1
Di- <i>n</i> -octylphthalate	5	Trichloronate	1
Dibenzo[<i>a,h</i>]a ntracene	5	EPA Method 8260	
Dibenzofuran	5	1,1,1,2-Tetrachloroethane	0.5
Diethylphthalate	5	1,1,1-Trichloroethane	0.5
Dimethylphthalate	5	1,1,2,2-Tetrachloroethane	0.5
Fluoranthene	5	1,1,2-Trichloroethane	0.5
Fluorene	5	1,1-Dichloroethane	0.5
Hexachlorobenzene	5	1,1-Dichloroethene	0.5
Hexachlorobutadiene	5	1,2,3-Trichloropropane	0.5
Hexachlorocyclopentadiene	5	1,2-Dibromo-3-chloropropane	0.5
Hexachloroethane	5	1,2-Dichloroethane	0.5
Indeno[1,2,3- <i>c,d</i>]p yrene	5	1,2-Dichloroethene (total)	0.5
Isophorone	5	1,2-Dichloropropane	0.5
<i>m</i> - and <i>p</i> -Cresol	5	2-Butanone	0.5
<i>N</i> -Nitroso-di- <i>n</i> -propylamine	5	2-Chloroethylvinylether	0.5
Naphthalene	5	2-Hexanone	0.5
Nitrobenzene	5	4-Methyl-2-pentanone	0.5
Pentachlorophenol	5	Acetone	10
Phenanthrene	5	Acetonitrile	100
Phenol	5	Acrolein	50
Pyrene	5	Acrylonitrile	50
EPA Method 632		Benzene	0.5
Diuron	0.1	Bromodichloromethane	0.5
EPA Method 8082		Bromoform	0.5
Polychlorinated biphenyls (PCBs)	0.5	Bromomethane	0.5
EPA Method 8140		Carbon disulfide	5
Bolstar	1	Carbon tetrachloride	0.5
Chlorpyrifos	1	Chlorobenzene	0.5
Coumaphos	1	Chloroethane	0.5
Demeton	1	Chloroform	0.5
Diazinon	1	Chloromethane	0.5
Dichlorvos	1	Chloroprene	5
Disulfoton	1	Dibromochloromethane	0.5
Ethoprop	1	Dichlorodifluoromethane	0.5
Fensulfothion	1	Ethanol	1000
Fenthion	1	Ethylbenzene	0.5
Merphos	1	Freon-113	0.5
Methyl Parathion	1	Methylene chloride	0.5
Mevinphos	1	Styrene	0.5
		Tetrachloroethene	0.5
		Toluene	0.5

B. EPA Methods of Environmental Water Analysis

Table B-2 (cont.). Organic constituents of concern in water samples and their contractual reporting limits of concentration, sorted by analytical method.

Constituent of concern	Reporting limit (µg/L) ^(a,b)	Constituent of concern	Reporting limit (µg/L) ^(a,b)
EPA Method 8260 (cont)		1,2,3,7,8,9-HxCDF	0.00025
Total xylene isomers	0.5	1,2,3,7,8-PeCDD	0.0001
Trichloroethene	0.5	1,2,3,7,8-PeCDF	0.0001
Trichlorofluoromethane	0.5	2,3,4,6,7,8-HxCDF	0.00025
Vinyl acetate	20	2,3,4,7,8-PeCDF	0.0001
Vinyl chloride	0.5	2,3,7,8-TCDD	0.0001
<i>cis</i> -1,2-Dichloroethene	0.5	2,3,7,8-TCDF	0.0001
<i>cis</i> -1,3-Dichloropropene	0.5	OCDD	0.0005
<i>trans</i> -1,2-Dichloroethene	0.5	OCDF	0.0005
<i>trans</i> -1,3-Dichloropropene	0.5	EPA Method 8330B	
EPA Method 8290		HMX ^(c)	5 or 1
1,2,3,4,6,7,8-HpCDD	0.00025	RDX ^(d)	5
1,2,3,4,6,7,8-HpCDF	0.00025	TNT ^(e)	0.0001
1,2,3,4,7,8,9-HpCDF	0.00025	EPA Method 9131 or Standard Method 9221	
1,2,3,4,7,8-HxCDF	0.00025	Fecal coliform bacteria	1 to 2
1,2,3,6,7,8-HxCDD	0.00025	Total coliform bacteria	1 to 2
1,2,3,6,7,8-HxCDF	0.00025		
1,2,3,7,8,9-HxCDD	0.00025		

(a) The number of decimal places displayed in this table vary by constituent. These variations reflect regulatory agency permit stipulations, the applicable analytical laboratory contract under which the work was performed, or both.

(b) These reporting limits are for water samples with low concentrations of dissolved solids. If higher concentrations are present, limits are likely to be higher.

(c) HMX is octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.

(d) RDX is hexahydro-1,3,5-trinitro-1,3,5-triazine.

(e) TNT is 2,4,6-trinitrotoluene.

(f) MPN = most probable number (of organisms).