TABLE IB. – LIST OF APPROVED INORGANIC TEST PROCEDURES

[Editor's Note: This document highlights changes to Table 1 B of Part 136 as a result of the 2012 Method Update Rule. Changes are shown in red font, except deleted language is not shown. As with other LABFACTS documents, minor formatting changes have been made to improve readability. Catalyst has attempted to capture all changes, but if errors are noted, please let us know.]

Rev 1.2: 5/25/12
Added changes from table EPA Published on May 18 correcting typos and other editorial errors

Rev 1.3
6/11/12
Added ICP/MS methods for Boron that were left off.

Parameter	Methodology[58]	EPA[52]	Standard Methods	ASTM	USGS[2] / AOAC / Other
1. Acidity, as CaCO3, mg/L	Electrometric endpoint or phenolphthalein endpoint		2310 B-97	D1067-06	I-1020-85
2. Alkalinity, as CaCO3, mg/L	Electrometric or Colorimetric titration to pH 4.5, manual		2320 B-97	D1067-06	973.43[3] I-1030-85
	or automated	310.2 (Rev 1974)			I-2030-85
3. Aluminum--Total,[4] mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration[36]		3111 D-99 or E-99		I-3051-85
	AA furnace		3113 B-04		
	STGFAA	200.9, Rev.2.2 (1994)			
	ICP/AES [36]	200.5, Rev.4.2 (2003)[68], 200.7 Rev 4.4 (1994)	3120 B-99	D1976-07	I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3] , I-4471-97[50]
	Direct Current Plasma (DCP) [36]			D4190-08	See footnote 34
	Colorimetric (Eriochrome cyanine R)		3500-Al B-01		
4. Ammonia (as N), mg/L	Manual, distillation[6] or gas diffusion (at pH >11), followed by any of the following:	350.1 Rev. 2.0 (1993)	4500-NH_3B-97		973.49[3]
	Nesslerization			D1426-08	973.49[3] I-3520-85[2]
	Titration		4500-NH_3C-97		973.49[3]
	Electrode		4500-NH_3 D or E-97	D1426-08 (B)	
	Manual phenate, salicylate, or other substituted phenols in Berthelot reaction based methods		4500-NH_3 F -97		
	Automated phenate, salicylate, or other substituted phenols in Berthelot reaction based methods	350.1[50] Rev. 2.0 (1993)	4500-NH_3 G-97 4500-NH_3 H -97		I-4523-85[2]
	Automated electrode				See footnote 7.
	Ion chromatography			D6919-09	
5. Antimony-Total,[4] mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration[36]		3111 B-99		
	AA furnace		3113 B-04		
	STGFAA	200.9, Rev.2.2 (1994)			
	ICP/AES[36]	200.5, Rev.4.2 (2003)[68],	3120 B-99	D1976-07	I-4471-97[50]

		200.7 Rev 4.4 (1994)			
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3] , I-4471-97[50]
6. Arsenic-Total,[4] mg/L	Digestion[4] followed by any of the following	206.5 (1978)[1]			
	AA gaseous hydride		3114 B-09 or 3114 C-09	D2972-08 (B)	I-3062-85
	AA furnace		3113 B -99	D2972-08 (C)	I-4063-98[49]
	STGFAA	200.9, Rev.2.2 (1994)			
	ICP/AES [36]	200.5, Rev.4.2 (2003)[68], 200.7 Rev 4.4 (1994)	3120 B-99	D1976-07	
	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	D5673-03	993.14[3] , I-4471-97[50]
	Colorimetric (SDDC)		3500-As B-97	D2972-08 (A)	I-3060-85[2]
7. Barium--Total,[4] mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration[14]		3111D-99		I-3084-85[2]
	AA furnace		3113 B-04	D4382-02(07)	
	ICP/AES[14]	200.5, Rev.4.2 (2003)[68], 200.7 Rev 4.4 (1994)	3120 B-99		I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3] , I-4471-97[50]
	DCP[36]				See footnote 34.
8. Beryllium--Total,[4] mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration		3111D-99 or E-99	D3645-08 (A)	I-3095-85[2]
	AA furnace		3113 B-04	D3645-08 (B)	
	STGFAA	200.9, Rev.2.2 (1994)			
	ICP/AES	200.5, Rev.4.2 (2003)[68], 200.7 Rev 4.4 (1994)	3120 B-99	D1976-07	I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3] , I-4471-97[50]
	DCP, or			D4190-08	See footnote 34
	Colorimetric (aluminon)		See footnote 61		
9. Biochemical oxygen demand (BOD5), mg/L	Dissolved Oxygen Depletion		5210 B-01		973.44,[3] p. 17.[9] I-1578-78[8] See footnote 10, 63
10. Boron[37]--Total, mg/L	Colorimetric (curcumin)		4500-B B-00		I-3112-85 [2]
	ICP/AES, or	200.5, Rev.4.2 (2003)[68] 200.7 Rev 4.4 (1994)	3120 B-99	D1976-07	I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3] , I-4471-97[50]
	DCP			D4190-08	See footnote 34
11. Bromide, mg/L	Electrode			D1246-05	I-1125-85[2]
	Ion chromatography	300.0, Rev. 2.1 (1993) and 300.1, Rev. 1.0 (1997)	4110 B-00, C-00, D-00	D4327-03	993.30[3]
	CIE/UV		4140 B-97	D6508-00 (05)	D6508, Rev. 2[54]
12. Cadmium--Total,[4] mg/L	Digestion [4] followed by any of the following				
	AA direct aspiration[36]		3111 B-99 or C-99	D3557-02 (07) (A or B)	974.27[3] p.37[9] I-3135-85[2], I-3136-85[2]
	AA furnace		3113 B-04	D3557- 02 (07) (D)	I-4138-89[51]
	STGFAA	200.9, Rev.2.2 (1994)			
	ICP/AES[36]	200.5, Rev.4.2 (2003)[68], 200.7 Rev 4.4 (1994)	3120 B-99	D1976-07	I-1472-85, I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3]

	DCP[36]			D4190-08	See footnote 34
	Voltametry,[11]			D3557-02(07) (C)	
	Colorimetric (Dithizone)		3500 Cd D-90		
13. Calcium--Total,[4] mg/L	Digestion[4] followed by:				
	AA direct aspiration		3111 B-99	D511-08 (B)	I-3152-85 [2]
	ICP/AES	200.5, Rev.4.2 (2003)[68], 200.7 Rev 4.4 (1994)	3120 B-99		I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3]
	DCP				See footnote 34
	Titrimetric (EDTA)		3500-Ca B-97	D511-08 (A)	
	Ion chromatography			D6919-09	
14. Carbonaceous biochemical oxygen demand ($CBOD_5$), mg/L[12]	Dissolved Oxygen Depletion with nitrification inhibitor		5210 B-01		See footnote 35, 63
15. Chemical oxygen demand (COD), mg/L	Titrimetric	410.3 (Rev. 1978)	5220 B-97 or C-97	D1252-06 (A)	973.46[3] p 17[9] I-3560-85[2]
	Spectrophotometric, manual or automated	410.4 Rev. 2.0, (1993)	5220 D-97	D1252-06 (B)	I-3561-85[2]
16. Chloride, mg/L	Titrimetric (silver nitrate) or		4500-Cl^- B-97	D512-04 (B)	I-1183-85[2]
	(Mercuric nitrate)		4500-Cl^- C-97	D512-04 (A)	973.51.[3] I-1184-85[2]
	Colorimetric, manual or				I-1187-85 [2]
	Automated (Ferricyanide)		4500-Cl^- E-97		I-2187-85 [2]
	Potentiometric Titration		4500-Cl^- D-97		
	Ion Selective Electrode			D512-04 (C)	
	Ion chromatography	300.0, Rev. 2.1 (1993) and 300.1, rev. 1.0 (1997)	4110 B-00 or C-00	D4327-03	993.30[3] I-2057-90[51]
	CIE/UV		4140 B-97	D6508-00(05)	D6508, Rev. 2[54]
17. Chlorine--Total residual, mg/L	Amperometric direct		4500-Cl D-00	D1253-08	
	Amperometric direct (low level)		4500-Cl E-00		
	Iodometric direct		4500-Cl B-00		
	Back titration either endpoint[15] or		4500-Cl C-00		
	DPD-FAS		4500-Cl F-00		
	Spectrophotometric, DPD		4500-Cl G-00		
	Electrode				See footnote 16.
17A. Chlorine, Free available, mg/L	Amperometric direct		4500-Cl D-00	D1253-08	
	Amperometric direct (low level)		4500-Cl E-00		
	DPD-FAS		4500-Cl F-00		
	Spectrophotometric, DPD		4500-Cl G-00		
18. Chromium VI dissolved, mg/L	0.45 micron filtration followed by any of the following				
	AA chelation-extraction or		3111 C -99		I-1232-85[2]
	Ion chromatography	218.6, Rev 3.3 (1994)	3500-Cr C-09	D5257-03	993.23[3]
	Colorimetric (Diphenylcarbazide)		3500-Cr B-09	D1687-02(07) (A)	I-1230-85[2]
19. Chromium--Total,[4] mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration[36]		3111 B-99	D1687-02(07) (B)	974.27[3] I-3236-85[2]
	AA chelation-extraction		3111 C-99		

	AA furnace		3113 B-99	D1687-02(07) (C)	I-3233-93[46]
	STGFAA	200.9, Rev.2.2 (1994)			
	ICP/AES[36]	200.5, Rev.4.2 (2003)[68], 200.7 Rev 4.4 (1994)	3120 B-99	D1976-07	I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3] , I-4020-05[70]
	DCP, [36] or			D4190-08	See footnote 34
	Colorimetric (Diphenylcarbazide)		3500-Cr B-09		
20. Cobalt--Total,[4] mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration		3111B-99 or C-99	D3558-08 (A or B)	p. 37.[9] I-3239-85
	AA furnace		3113 B-04	D3558-08 (C)	I-4243-89[51]
	STGFAA	200.9, Rev.2.2 (1994)			
	ICP/AES[36]	200.5, Rev.4.2 (2003)[68], 200.7 Rev 4.4 (1994)	3120 B-99	D1976-07	I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3] , I-4020-05[70]
	DCP		.	D4190-08	See footnote 34
21. Color platinum cobalt units or dominant wavelength, hue, luminance purity:	Colorimetric (ADMI), or				See footnote 18.
	Spectrophotometric (Platinum cobalt)		2120 B-01		I-1250-85 [2]
22. Copper--Total,[4]mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration[36]		3111B-99 or C-99	D1688-07(A or B)	974.27[3] p. 37.[9] I-3270-85[2] I-3271-85[2]
	AA furnace		3113 B-04	D1688-07 (C)	I-4274-89[51]
	STGFAA	200.9, Rev.2.2 (1994)			
	ICP/AES[36]	200.5, Rev.4.2 (2003)[68], 200.7 Rev 4.4 (1994)	3120 B-99	D1976-07	I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3] , I-4020-05[70]
	DCP[36] or			D4190-08	See footnote 34
	Colorimetric (Neocuproine) or		3500-Cu B-99		
	(Bathocuproine)		3500-Cu C-99		See footnote 19
23. Cyanide--Total, mg/L	Automated Distillation and Colorimetry, or				Kelada-01[55]
	Segmented Flow Injection, In-Line Ultraviolet Digestion followed by gas diffusion amperometry.			D7511-09	
	Manual distillation with $MgCl_2$ followed by any of the following	335.4, Rev. 1.0 (1993)[57]	4500-CN B-99 or C-99	D2036-09 (A) D7284-08	10-204-00-1-X[56]
	Flow Injection, gas diffusion amperometry			D2036-09(A) D7284-08	
	Titrimetric, or		4500-CN D-99	D2036-09 (A)	p. 22.[9]
	Spectrophotometric, manual or		4500-CN E-99	D2036-09 (A)	I-3300-85[2]
	Semi-Automated[20]	335.4, Rev. 1.0 (1993)[57]			10-204-00-1-X[56] I-4302-85[2]
	Ion Chromatography			D2036-09(A)	
	Ion Selective Electrode		4500-CN F-99	D2036-98 (A)	
24. Cyanide, **Available** mg/L	Cyanide Amenable to Chlorination (CATC); Manual distillation with $MgCl_2$ followed by titrimetric or spectrophotometric		4500-CN G-99	D2036-09 (B)	
	Flow injection and ligand exchange, followed by			D6888-09	OIA-1677-09[44]

	amperometry[61]				
	Automated Distillation and Colorimetry				Kelada-01[55]
24A. Cyanide, **Free,** mg/L	Flow Injection, followed by gas diffusion amperometry			D7237-10	OIA-1677-09[44]
	Manual micro-diffusion and colorimetry			D4282-02	
25. Fluoride--Total, mg/L	Manual distillation[6] followed by any of the following		4500-F B-97		
	Electrode, manual or		4500-F C-97	D1179-04 (B)	
	Automated				I-4327-85[2]
	Colorimetric (SPADNS)		4500-F D-97	D1179-04 (A)	
	Automated complexone		4500-F E-97		
	Ion chromatography	300.0, Rev. 2.1 (1993) and 300.1, rev. 1.0 (1997)	4110 B-00 or C-00	D4327-03	993.30[3]
	CIE/UV		4140 B-97	D6508-00	D6508, Rev. 2[54]
26. Gold--Total,[4]mg/L	Digestion[4]followed by any of the following				
	AA direct aspiration		3111B-99		
	AA furnace, or	231.2 (Issued 1978)[1]	3113 B-04		
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3]
	DCP				See footnote 34
27. Hardness--Total, as $CaCO_3$, mg/L	Automated colorimetric,	130.1 (Issued 1971)[1]			
	Titrimetric (EDTA)		2340 C-97	D1126-02 (07)	973.52B.[3] I-1338-85[2]
	Ca plus Mg as their carbonates, by inductively coupled plasma or AA direct aspiration.		2340 B-97		
28. Hydrogen ion (pH), pH units	Electrometric measurement		4500-H^+-00	D1293-99 (A or B)	973.41.[3] I-1586-85[2]
	Automated electrode	150.2 (Dec. 1982) [1]			See footnote 21 I-2587-85[2]
29. Iridium--Total,[4]mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration or		3111 B-99		
	AA furnace	235.2 (Issued 1978) [1]			
	ICP/MS		3125 B-09		
30. Iron--Total,[4]mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration[36]		3111 B-99 or C-99	D1068-05 (A or B)	974.27.[3] I-3381-85[2]
	AA furnace		3113B-04	D1068-05 (C)	
	STGFAA	200.9, Rev.2.2 (1994)			
	ICP/AES[36]	200.5, Rev.4.2 (2003)[68], 200.7 Rev 4.4 (1994)	3120 B-99	D1976-07	I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3] , I-4471-97[50]
	DCP[36] or			D4190-08	See footnote 34
	Colorimetric (Phenanthroline)		3500-Fe -97	D1068-05 (D)	See footnote 22.
31. Kjeldahl Nitrogen[5]--Total, (as N), mg/L	Manual digestion[20] and distillation or gas diffusion followed by any of the following		4500-N_{org} B-97 or C-97 and 4500-NH_3 B-97	D3590-02 (06) (A)	I-4515-91[45]
	Titration		4500-NH_3 C-97	D3590-89, 02 (A)	973.48.[3]
	Nesslerization			D1426-08 (A)	
	Electrode		4500-NH_3 D-97 or E-97	D1426-08 (B)	

	Semi-automated phenate	350.1 Rev. 2.0 (1993)	4500-NH_3 G-97 or H-97		
	Manual phenate, salicylate, or other substituted phenols in Berthelot reaction based methods		4500-NH3 F-1997		See footnote 60
	Automated methods for TKN that do not require manual digestion				
	Automated phenate, salicylate, or other substituted phenols in Berthelot reaction based methods colorimetric (auto digestion and distillation)	351.1 (1978)			I-4551-78[8]
	Semi-automated block digestor colorimetric (distillation not required)	351.2, Rev. 2.0 (1993)	4500-N_{org} D-97	D3590-02 (06) (B)	I-4515-91[45]
	Manual or block digestor Potentiometric				
	Block Digester, followed by Auto distillation and Titration				See footnote 39.
	Block Digester, followed by Auto distillation and Nesslerization				See footnote 40.
	Block Digester, followed by Flow injection gas diffusion (distillation not required)				See footnote 41.
32. Lead--Total,[4] mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration[36]		3111 B-99 or C-99	D3559-08 (A or B)	974.27.[3] I-3399-85[2]
	AA furnace		3113 B-04	D3559-08 (D)	I-4403-89[51]
	STGFAA	200.9, Rev.2.2 (1994)			
	ICP/AES[36]	200.5, Rev.4.2 (2003)[68], 200.7 Rev 4.4 (1994)	3120 B-99	D1976-07	I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3] , I-4471-97[50]
	DCP[36]			D4190-08	See footnote 34
	Voltametry[11] or			D3559-08 (C)	
	Colorimetric (Dithizone)		3500-Pb B-97		
33. Magnesium--Total,[4] mg/L	Digestion[4] followed by:				
	AA direct aspiration		3111 B-99	D511-08 (B)	974.27[3] I-3447-85[2]
	ICP/AES	200.5, Rev.4.2 (2003)[68], 200.7 Rev 4.4 (1994)	3120 B-99	D1976-07	I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3]
	DCP, or				See footnote 34.
	Gravimetric				
	Ion chromatography			D6919-09	
34. Manganese--Total,[4] mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration[36]		3111 B-99	D858-07 (A or B)	974.27.[3] I-3454-85[2]
	AA furnace		3113 B-04	D858-07 (C)	
	STGFAA	200.9, Rev.2.2 (1994)			
	ICP/AES[36]	200.7[5] Rev 4.4 (1994)	3120 B-99	D1976-07	I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3] , I-4471-97[50]
	DCP[36] or			D4190-94, 99	See footnote 34
	Colorimetric (Persulfate), or		3500-Mn-99		920.203[3]
	(Periodate)				See footnote 23
35. Mercury--Total,[4] mg/L	Cold vapor, Manual	245.1, Rev. 3.0 (1994)	3112 B-09	D3223-07	977.22.[3] I-3462-85[2]
	Cold vapor, Automated	245.2 (1974)[1]			
	Cold vapor atomic fluorescence spectrometry (CVAFS)	245.7, Rev. 2.0 (2005)[17]			I-4464-01
	Purge and trap CVAFS	1631E [43]			

36. Molybdenum--Total,[4] mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration		3111 D-99		I-3490-85[2]
	AA furnace		3113 B-04		I-3492-96[47]
	ICP/AES[36]	200.7 Rev 4.4 (1994)	3120 B-99	D1976-07	I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3] , I-4471-97[50]
	DCP				See footnote 34
37. Nickel--Total,[4] mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration[36]		3111 B-99 or C-99	D1886-08 (A or B)	I-3499-85[2]
	AA furnace		3113 B-04	D1886-08(C)	I-4503-89[51]
	STGFAA	200.9, Rev.2.2 (1994)			
	ICP/AES[36]	200.5, Rev.4.2 (2003)[68], 200.7 Rev 4.4 (1994)	3120 B-99	D1976-07	I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3] , I-4471-97[50]
	DCP[36], or			D4190-08	See footnote 34.
38. Nitrate (as N), mg/L	Ion chromatography	300.0, Rev. 2.1 (1993) and 300.1, rev. 1.0 (1997)	4110 B-99 or C-99	D4327-03	993.30[3]
	CIE/UV		4140 B-97	D6508-00 (05)	D6508, Rev. 2[54]
	Ion Selective Electrode		4500-NO_3 D-00		
	Colorimetric (Brucine sulfate)	352.1(Issued 1971)[1]			973.50[3] 419 D[17] p. 28.[9]
	Nitrate-nitrite N minus Nitrite N (See parameters 39 and 40).				See footnote 62.
39. Nitrate-nitrite (as N), mg/L	Cadmium reduction, Manual		4500-NO_3 E-00	D3867-04 (B)	
	Cadmium reduction, Automated, or	353.2, Rev. 2.0 (1993)	4500-NO_3 F-00	D3867-04(A)	I-4545-85[2]
	Automated hydrazine		4500-NO_3 H-00		
	Ion chromatography	300.0, Rev. 2.1 (1993) and 300.1, rev. 1.0 (1997)	4110 B-00 or C-00	D4327-03	993.30[3]
	CIE/UV		4140 B-97	D6508-00 (05)	D6508, Rev. 2[54]
40. Nitrite (as N), mg/L;	Spectrophotometric: Manual or		4500-NO_2 B-00		See footnote 25.
	Automated (Diazotization)				I-4540-85[2] See footnote 62.
	Automated (*bypass cadmium reduction)	353.2, Rev. 2.0 (1993)	4500-NO_2 F-00	D3867-04 (A)	I-4545-85[2]
	Manual (*bypass cadmium reduction)		4500-NO_2 E-00	D3867-04 (B)	
	Ion chromatography	300.0, Rev. 2.1 (1993) and 300.1, rev. 1.0 (1997)	4110 B-00 or C-00	D4327-03	993.30[3]
	CIE/UV		4140 B-97	D6508-00 (05)	D6508, Rev. 2[54]
41. Oil and grease--Total recoverable, mg/L	Oil and grease and non-polar material, mg/L: Hexane extractable material (HEM): n-Hexane extraction and gravimetry.	1664A, 1664B[42]	5520 B-01[38]		
	Silica gel treated HEM (SGT-HEM): Silica gel treatment and gravimetry.	1664A, 1664B[42]	5520 B-01[38] and 5520 F-01[38]		
42. Organic carbon--Total (TOC), mg/L	Combustion		5310 B-00	D2579-09	973.47[3], p. 14.[24]
	Heated persulfate or UV persulfate oxidation.		5310 C-00 or D-00	D4830-03	973.47[3], p. 14.[24]
43. Organic nitrogen (as N), mg/L	Total Kjeldahl N minus ammonia N				
44. Orthophosphate (as P), mg/L	Ascorbic acid method				
	Automated	365.1, Rev. 2.0 (1993)	4500-P F -99 or G-99		973.56.[3] I-4601-85[2]
	Manual single reagent		4500-P E-99	D515-88(A)	973.55[3]

	Manual two reagent	365.3 (Issued 1978)[1]			
	Ion chromatography	300.0, Rev. 2.1 (1993) and 300.1, rev. 1.0 (1997)	4110 B-99 or C-00	D4327-03	993.30[3]
	CIE/UV		4140-97	D6508-00 (05)	D6508, Rev. 2[54]
45. Osmium--Total[4], mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration, or		3111 D-99		
	AA furnace	252.2 (1978) [1]			
46. Oxygen, dissolved, mg/L	Winkler (Azide modification), or		4500-O B-01, C-01, D-01, E-01, F-01	D888-09 (A)	973.45B[3] I-1575-78[8]
	Electrode		4500-O G-01	D888-09 (B)	I-1576-78[8]
	Luminescence Based Sensor			D888-09 (C)[68]	See footnote 63, 64
47. Palladium--Total,[4]mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration, or		3111 B-99		p. S27.[10]
	AA furnace	253.2 (1978) [1]			p. S28.[10]
	ICP/MS		3125 B-09		
	DCP				See footnote 34
48. Phenols, mg/L	Manual distillation[26] followed by any of the following	420.1 (Rev. 1978) [1]	5530B-05	D1783-01	
	Colorimetric (4AAP) manual, or	420.1 (Rev. 1978) [1]	5530D-05[27]	D1783-01 (A or B)	
	Automated colorimetric (4AAP)	420.4 Rev. 1.0 (1993) [1]			
49. Phosphorus (elemental), mg/L	Gas-liquid chromatography				See footnote 28.
50. Phosphorus--Total, mg/L	Digestion[20] followed by any of the following		4500-P B (5)-99		973.55[3]
	Manual or	365.3 (1978) [1]	4500-P E -99	D515-88(A)	
	Automated ascorbic acid reduction	365.1, Rev. 2.0 (1993) [1]	4500-P F -99, G-99, H-99		973.56.[3] I-4600-85[2]
	ICP/AES[4, 36]	200.7 Rev 4.4 (1994)	3120 B-99		I-4471-97[50]
	Semi-automated block digestor (TKP Digestion)	365.4 (1974) [1]		D515-88(B)	I-4610-91[48]
51. Platinum--Total,[4] mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration		3111 B-99		
	AA furnace	255.2 (Issued 1978) [1]			
	ICP/MS		3125 B-09		
	DCP				See footnote 34.
52. Potassium--Total,[4] mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration		3111 B-99		973.53.[3] I-3630-85[2]
	ICP/AES[36]	200.7 Rev 4.4 (1994)	3120 B-99		
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3]
	Flame photometric		3500-K B-97		
	Electrode		3500-K C-97		
	Ion chromatography			D6919-09	
53. Residue--Total, mg/L	Gravimetric, 103-105°		2540 B-97		I-3750-85[2]
54. Residue--filterable, mg/L	Gravimetric, 180°		2540 C-97	D5907-03	I-1750-85[2]
55. Residue--nonfilterable (TSS), mg/L	Gravimetric, 103-105° post washing of residue		2540 D-07	D5907-03	I-3765-85[2]
56. Residue--settleable, mg/L	Volumetric, (Imhoff cone), or gravimetric		2540 F-97		
57. Residue--Volatile, mg/L	Gravimetric, 550°	160.4 (Issued 1971)[1]	2540 E-97		I-3753-85[2]
58. Rhodium--Total,[4] mg/L	Digestion[4] followed by any of the following				

	AA direct aspiration, or		3111 B-99		
	AA furnace	265.2 (Issued 1978)[1]			
	ICP/MS		3125 B-09		
59. Ruthenium--Total,[4] mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration, or		3111 B-99		
	AA furnace	267.2[1]			
	ICP/MS		3125 B-09		
60. Selenium--Total,[4] mg/L	Digestion[4] followed by any of the following				
	AA furnace		3113 B-04	D3859-08 (B)	I-4668-98[49]
	STGFAA	200.9, Rev.2.2 (1994)			
	ICP/AES[36]	200.5, Rev.4.2 (2003)[68], 200.7 Rev 4.4 (1994)	3120 B-99	D1976-07	I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-03	993.14[3] I-4020-05[70]
	AA gaseous hydride		3114 B-09 or C-09	D3859-08 (A)	I-3667-85[2]
61. Silica[37]--Dissolved, mg/L	0.45 micron filtration followed by any of the following				
	Colorimetric, Manual or		4500-SiO_2 C-97	D859-05	I-1700-85[2]
	Automated (Molybdosilicate)		4500-SiO_2 E-97 or F-97		I-2700-85[2]
	ICP/AES[36]	200.5, Rev.4.2 (2003), 200.7 Rev 4.4 (1994)	3120 B-99		I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3]
62. Silver--Total,[4] mg/L	Digestion[4,29] followed by any of the following				
	AA direct aspiration		3111 B-99 or C-99		974.27[3] p. 37.[9] I-3720-85[2]
	AA furnace		3113 B-04		I-4724-89[51]
	STGFAA	200.9, Rev.2.2 (1994)			
\	ICP/AES[36]	200.5, Rev.4.2 (2003)[68], 200.7 Rev 4.4 (1994)	3120 B-99	D1976-07	I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3] , I-4471-97[50]
	DCP				See footnote 34.
63. Sodium--Total,[4] mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration		3111 B-99		973.54. [3] I-3735-85[2]
	ICP/AES[36]	200.5, Rev.4.2 (2003)[68], 200.7 Rev 4.4 (1994)	3120 B-99		I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3]
	DCP				See footnote 34.
	Flame photometric		3500 Na B-97		
	Ion chromatography			D6919-09	
64. Specific conductance, micromhos/cm at 25 °C:	Wheatstone bridge	120.1[1] (1982)	2510 B-97	D1125-95 (99) (A)	973.40.[3] I-1780-85[2]
65. Sulfate (as SO_4), mg/L	Automated colorimetric	375.2[1], Rev. 2.0 (1993)	4500-SO_4 F-97 or G-97		
	Gravimetric		4500-SO_4 C-97 or D-97		925.54[3]
	Turbidimetric		4500-SO_4 E-97	D516-07	
	Ion chromatography	300.0, Rev. 2.1 (1993) and 300.1, rev. 1.0 (1997)	4110 B-00 or C-00	D4327-03	993.30[3] I-4020-05
	CIE/UV		4140 B-97	D6508-00 (05)	D6508, Rev. 2[54]
66. Sulfide (as S), mg/L	Sample pretreatment		4500-S^{-2}B, C-		

			00		
	Titrimetric (iodine)		4500-S^{-2}F-00		I-3840-85[2]
	Colorimetric (methylene blue)		4500-S^{-2} D-00		
	Ion Selective Electrode		4500-S^{-2} G-00	D4659-[08]	
67. Sulfite (as SO3), mg/L	Titrimetric (iodine-iodate)		4500-SO_3^{-2} B-00		
68. Surfactants, mg/L	Colorimetric (methylene blue)		5540 C-00	D2330-02	
69. Temperature, °C	Thermometric		2550 B-00		See footnote 32.
70. Thallium--Total,[4] mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration		3111 B-99		
	AA furnace	279.2[1] (1978)	3113 B-04		
	STGFAA	200.9, Rev.2.2 (1994)			
	ICP/AES[36]	200.5, Rev.4.2 (2003)[68] 200.7 Rev 4.4 (1994)	3120 B-99	D1976-07	
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3] , I-4471-97[50]
71. Tin--Total,[4] mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration		3111 B -99		I-3850-78[8]
	AA furnace, or		3113 B -04		
	STGFAA	200.9, Rev.2.2 (1994)			
	ICP/AES[36]	200.5, Rev.4.2 (2003)[68], 200.7 Rev 4.4 (1994)		D1976-07	
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3]
72. Titanium--Total,[4] mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration		3111 D-99		
	AA furnace	283.2[1] (1978)			
	ICP/AES[36]	200.7 Rev 4.4 (1994)			
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3]
	DCP				See footnote 34.
73. Turbidity, NTU	Nephelometric	180.1[1], Rev. 2.0 (1993)	2130 B-01	D1889-00	I-3860-85[2] See footnote 65, 66, 67
74. Vanadium--Total,[4] mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration		3111 D -99		
	AA furnace		3113 B -04	D3373- 03(07)	
	ICP/AES[36]	200.5, Rev.4.2 (2003)[68], 200.7 Rev 4.4 (1994)	3120 B-99	D1976-07	I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3] , I-4471-97[50]
	DCP, or			D4190-08	See footnote 34.
	Colorimetric (Gallic acid)		3500-V B-97		
75. Zinc--Total,[4] mg/L	Digestion[4] followed by any of the following				
	AA direct aspiration[36]		3111 B-99 or C-99	D1691-02(07) (A or B)	974.27[3] p. 37.[9] I-3900-85[2]
	AA furnace	289.2[1] (1978)			
	ICP/AES[36]	200.5, Rev.4.2 (2003)[68], 200.7 Rev 4.4 (1994)	3120 B-99	D1976-07	I-4471-97[50]
	ICP/MS	200.8, Rev 5.4 (1998)	3125 B-09	D5673-05	993.14[3] , I-4471-97[50]
	DCP[36]			D4190-08	See footnote 34.
	Colorimetric (Dithizone) (Zincon)		3500-Zn B-97		See footnote 33.
76. Acid Mine Drainage		1627[69]			

Notes:

1 "Methods for Chemical Analysis of Water and Wastes," Environmental Protection Agency, Environmental Monitoring Systems Laboratory-Cincinnati (EMSL-CI), EPA-600/4-79-020, Revised March 1983 and 1979 where applicable.

2 Fishman, M. J., et al. "Methods for Analysis of Inorganic Substances in Water and Fluvial Sediments," U.S. Department of the Interior, Techniques of Water–Resource Investigations of the U.S. Geological Survey, Denver, CO, Revised 1989, unless otherwise stated.

3 "Official Methods of Analysis of the Association of Official Analytical Chemists," methods manual, Sixteenth Edition, 4th Revision, 1998.

4 For the determination of total metals (which are equivalent to total recoverable metals) the sample is not filtered before processing. A digestion procedure is required to solubilize analytes in suspended material and to break down organic-metal complexes (to convert the analyte to a detectable form for colorimetric analysis). For non-platform graphite furnace atomic absorption determinations a digestion using nitric acid (as specified in Section 4.1.3 of Methods for the Chemical Analysis of Water and Wastes) is required prior to analysis. The procedure used should subject the sample to gentle, acid refluxing and at no time should the sample be taken to dryness. For direct aspiration flame atomic absorption determinations (FLAA) a combination acid (nitric and hydrochloric acids) digestion is preferred prior to analysis. The approved total recoverable digestion is described as Method 200.2 in Supplement I of "Methods for the Determination of Metals in Environmental Samples" EPA/600R-94/111, May, 1994, and is reproduced in Methods 200.7, 200.8, and 200.9 from the same Supplement. However, when using the gaseous hydride technique or for the determination of certain elements such as antimony, arsenic, selenium, silver, and tin by non-EPA graphite furnace atomic absorption methods, mercury by cold vapor atomic absorption, the noble metals and titanium by FLAA, a specific or modified sample digestion procedure may be required and in all cases the referenced method write-up should be consulted for specific instruction and/or cautions. For analyses using inductively coupled plasma-atomic emission spectrometry (ICP-AES), the direct current plasma (DCP) technique or the EPA spectrochemical techniques (platform furnace AA, ICP-AES, and ICP-MS) use Method 200.2 or an approved alternate procedure (e.g., CEM microwave digestion, which may be used with certain analytes as indicated in Table IB); the total recoverable digestion procedures in Methods 200.7, 200.8, and 200.9 may be used for those respective methods. Regardless of the digestion procedure, the results of the analysis after digestion procedure are reported as "total" metals.

5 Copper sulfate or other catalysts that have been found suitable may be used in place of mercuric sulfate.

6 Manual distillation is not required if comparability data on representative effluent samples are on file to show that this preliminary distillation step is not necessary: however, manual distillation will be required to resolve any controversies. In general, the analytical method should be consulted regarding the need for distillation. If the method is not clear, the laboratory may compare a minimum of 9 different sample matrices to evaluate the need for distillation. For each matrix, a matrix spike and matrix spike duplicate are analyzed both with and without the distillation step. (A total of 36 samples, assuming 9 matrices). If results are comparable, the laboratory may dispense with the distillation step for future analysis. Comparable is defined as <20% RPD for all tested matrices). Alternatively the two populations of spike recovery percentages may be compared using a recognized statistical test.

7 Ammonia, Automated Electrode Method, Industrial Method Number 379-75 WE, dated February 19, 1976, Bran & Luebbe (Technicon) Auto Analyzer II, Bran & Luebbe Analyzing Technologies, Inc.

8 The approved method is that cited in "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments", USGS TWRI, Book 5, Chapter A1 (1979).

9 American National Standard on Photographic Processing Effluents, April 2, 1975.

10 In-Situ Method 1003-8-2009, Biochemical Oxygen Demand (BOD) Measurement by Optical Probe". Available from In-Situ, Incorporated, 221 E. Lincoln Avenue, Ft. Collins, CO 80524, Telephone: 970-498-1500

11 The use of normal and differential pulse voltage ramps to increase sensitivity and resolution isacceptable.

12 Carbonaceous biochemical oxygen demand (CBOD5) must not be confused with the traditional BOD5 test method which measures "total BOD." The addition of the nitrification inhibitor is nota procedural option, but must be included to report the CBOD5 parameter. A discharger whose permit requires reporting the traditional BOD5 may not use a nitrification inhibitor in theprocedure for reporting the results. Only when a discharger's permit specifically states CBOD5 is required can the permittee report data using a nitrification inhibitor.

13 OIC Chemical Oxygen Demand Method, Oceanography International Corporation.

14 Chemical Oxygen Demand, Method 8000, Hach Handbook of Water Analysis, 1979, Hach Chemical Company.

15 The back titration method will be used to resolve controversy.

16 Orion Research Instruction Manual, Residual Chlorine Electrode Model 97 - 70, 1977, Orion Research Incorporated. The calibration graph for the Orion residual chlorine method must be derived using a reagent blank and three standardsolutions, containing 0.2, 1.0, and 5.0 mL 0.00281 N potassium iodate/100 mL solution, respectively.

17 Method 245.7, Rev. 2.0, Mercury in Water by Cold Vapor Atomic Fluorescence Spectrometry, February 2005, EPA-821-R-05-001.

18 National Council of the Paper Industry for Air and Stream Improvement, Inc., Technical Bulletin 253, December 1971.

19 Copper, Biocinchoninate Method, Method 8506, Hach Handbook of Water Analysis, 1979, Hach Chemical Company.

20 When using a method with block digestion, this treatment is not required.

21 Hydrogen ion (pH) Automated Electrode Method, Industrial Method Number 378 - 75WA, October 1976, Bran & Luebbe (Technicon) Autoanalyzer II. Bran & Luebbe Analyzing Technologies, Inc.

22 Iron, 1,10-Phenanthroline Method, Method 8008, 1980, Hach Chemical Company.

23 Manganese, Periodate Oxidation Method, Method 8034, Hach Handbook of Wastewater Analysis, 1979, pages 2-113 and 2-117.

24 Wershaw, R. L., et al., "Methods for Analysis of Organic Substances in Water and Fluvial Sediments," Techniques of Water-Resources Investigation of the U.S. Geological Survey, Book 5, Chapter A3, (1972 Revised 1987) p. 14.

25 Nitrogen, Nitrite, Method 8507, Hach Chemical Company, P.O. Box 389, Loveland, CO 80537.

26 Just prior to distillation, adjust the sulfuric-acid-preserved sample to pH 4 with 1 + 9 NaOH.

27 The colorimetric reaction must be conducted at a pH of 10.0 ± 0.2.

28 R.F. Addison and R. G. Ackman, "Direct Determination of Elemental Phosphorus by Gas-Liquid Chromatography," *Journal of Chromatography*, Vol. 47, No. 3, pp. 421-426, 1970.

29 Approved methods for the analysis of silver in industrial wastewaters at concentrations of 1 mg/L and above are inadequate where silver exists as an inorganic halide. Silver halides such as the bromide and chloride are relatively insoluble in reagents such as nitric acid but are readily soluble in an aqueous buffer of sodium thiosulfate and sodium hydroxide to pH of 12. Therefore, for levels of silver above 1 mg/L, 20 mL of sample should be diluted to 100 mL by adding 40 mL each of 2 M Na2S2O3 and NaOH. Standards should be prepared in the same manner. For levels of silver below 1 mg/L the approved method is satisfactory.

30 The use of EDTA decreases method sensitivity. Analysts may omit EDTA or replace with another suitable complexing reagent provided that all method specified quality control acceptance criteria are met.

31 For samples known or suspected to contain high levels of silver (e.g., in excess of 4 mg/L), cyanogen iodide should be used to keep the silver in solution for analysis. Prepare a cyanogeniodide solution by adding 4.0 mL of concentrated NH4OH, 6.5 g of KCN, and 5.0 mL of a 1.0 N solution of I2 to 50 mL of reagent water in a volumetric flask and dilute to 100.0 mL. After digestion of the sample, adjust the pH of the digestate to >7 to prevent the formation of HCN under acidic conditions. Add 1 mL of the cyanogen iodide solution to the sample digestate and adjust the volume to 100 mL with reagent water (NOT acid). If cyanogen iodide is added to sample digestates, then silver standards must be prepared that contain cyanogen iodide as well. Prepare working standards by diluting a small volume of a silver stock solution with water andadjusting the pH>7 with NH4OH. Add 1 mL of the cyanogen iodide solution and let stand 1 hour. Transfer to a 100-mL volumetric flask and dilute to volume with water.

32 Stevens, H.H., Ficke, J. F., and Smoot, G. F., "Water Temperature–Influential Factors, Field Measurement and Data Presentation," Techniques of Water-Resources Investigations of the U.S.Geological Survey, Book 1, Chapter D1, 1975.

33 Zinc, Zincon Method, Method 8009, Hach Handbook of Water Analysis, 1979, pages 2-231 and 2-333, Hach Chemical Company.

34 "Direct Current Plasma (DCP) Optical Emission Spectrometric Method for Trace Elemental Analysis of Water and Wastes, Method AES0029," 1986–Revised 1991, Thermo Jarrell Ash Corporation, 27 Forge Parkway, Franklin, MA 02038

35 In-Situ Method 1004-8-2009, Carbonaceous Biochemical Oxygen Demand (CBOD) Measurement by Optical Probe. Available from In-Situ, Incorporated, 221 E. Lincoln Avenue, Ft. Collins, CO 80524, Telephone: 970-498-1500.

36 Microwave-assisted digestion may be employed for this metal, when analyzed by this methodology. "Closed Vessel Microwave Digestion of Wastewater Samples for Determination of Metals", CEM Corporation.

37 When determining boron and silica, only plastic, PTFE, or quartz laboratory ware may be used from start until completion of analysis.

38 Only use *n*-hexane (n-Hexane -- 85% minimum purity, 99.0% min. saturated C6 isomers, residue less than 1 mg/L) extraction solvent when determining Oil and Grease parameters – Hexane Extractable Material (HEM), or Silica Gel Treated HEM (analogous to EPA Methods 1664 A and 1664B). Use of other extraction solvents is prohibited.

39 Nitrogen, Total Kjeldahl, Method PAI-DK01 (Block Digestion, Steam Distillation, Titrimetric Detection), revised 12/22/94, OI Analytical/ALPKEM.

40 Nitrogen, Total Kjeldahl, Method PAI-DK02 (Block Digestion, Steam Distillation,Colorimetric Detection), revised 12/22/94, OI Analytical/ALPKEM.

41 Nitrogen, Total Kjeldahl, Method PAI-DK03 (Block Digestion, Automated FIA GasDiffusion), revised 12/22/94, OI Analytical/ALPKEM.

42 Method 1664 Revision B is the revised version of EPA Method 1664A.

43 USEPA. 2001. Method 1631, Revision E, "Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry" August 2002, Office of Water, U.S. Environmental Protection Agency (EPA-821-R-02-019). The application of clean techniques described in EPA's draft Method 1669: *Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels* (EPA-821-R-96-011) are recommended to preclude contamination at low-level, trace metal determinations.

44 Available Cyanide, Method OIA-1677, "Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry," ALPKEM.

45 "Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory – Determination of Ammonia Plus Organic Nitrogen by a Kjeldahl Digestion Method and an Automated Photometric Finish that Includes Digest Cleanup by Gas Diffusion," Open File Report (OFR) 00-170.

46 "Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory –Determination of Chromium in Water by Graphite Furnace Atomic Absorption Spectrophotometry," Open File Report (OFR) 93-449.

47 "Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory – Determination of Molybdenum by Graphite Furnace Atomic Absorption Spectrophotometry," Open File Report (OFR) 97-198.

48 "Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory – Determination of Total Phosphorus by Kjeldahl Digestion Method and an Automated Colorimetric Finish That Includes Dialysis" Open File Report (OFR) 92-146.

49 "Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory – Determination of Arsenic and Selenium in Water and Sediment by Graphite Furnace-Atomic Absorption Spectrometry" Open File Report (OFR) 98-639.

50 "Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory – Determination of Elements in Whole-water Digests Using Inductively Coupled Plasma-Optical Emission Spectrometry and Inductively Coupled Plasma-Mass Spectrometry," Open File Report

(OFR) 98-165.

51 "Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory –Determination of Inorganic and Organic Constituents in Water and Fluvial Sediments," Open File Report (OFR) 93-125.

52 Unless otherwise indicated, all EPA methods, excluding Method 300.1-1, are published in "Methods for the Determination of Metals in Environmental Samples," Supplement I, National Exposure Risk Laboratory-Cincinnati (NERL-CI), EPA/600/R-94/111, May 1994; and "Methods for the Determination of Inorganic Substances in Environmental Samples," NERL-CI, EPA/600/R-93/100, August, 1993. Method 300.1 is available from http://www.epa.gov/safewater/methods/pdfs/met300.pdf.

53 Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stabilized formazin (e.g., Hach StablCalTM or equivalent) are acceptable substitutes for formazin.

54 Method D6508, Rev. 2, "Test Method for Determination of Dissolved Inorganic Anions in Aqueous Matrices Using Capillary Ion Electrophoresis and Chromate Electrolyte," available from Waters Corp.

55 Kelada-01, "Kelada Automated Test Methods for Total Cyanide, Acid Dissociable Cyanide, and Thiocyanate," EPA 821-B-01-009, Revision 1.2, August 2001. Note: A 450-W UV lamp may be used in this method instead of the 550-W lamp specified if it provides performance within the quality control (QC) acceptance criteria of the method in a given instrument. Similarly, modified flow cell configurations and flow conditions may be used in the method, provided that the QC acceptance criteria are met.

56 QuikChem Method 10-204-00-1-X, "Digestion and Distillation of Total Cyanide in Drinkingand Wastewaters using MICRO DIST and Determination of Cyanide by Flow Injection Analysis" is available from Lachat Instruments.

57 When using sulfide removal test procedures described in EPA Method 335.4-1, reconstitute particulate that is filtered with the sample prior to distillation.

58 Unless otherwise stated, if the language of this table specifies a sample digestion and/or distillation "followed by" analysis with a method, approved digestion and/or distillation are required prior to analysis.

59 Samples analyzed for available cyanide using Methods OIA-1677-09 or D6888-09 that contain particulate matter may be filtered only after the ligand exchange reagents have been added to the samples, because the ligand exchange process converts complexes containing available cyanide to free cyanide, which is not removed by filtration. Analysts are further cautioned to limit the time between the addition of the ligand exchange reagents and sample filtration to no more than 30 minutes to preclude settling of materials in samples.

60 Analysts should be aware that pH optima and chromophore absorption maxima might differ when phenol is replaced by a substituted phenol as the color reagent in Berthelot Reaction (phenol-hypochlorite reaction) colorimetric ammonium determination methods. For example when phenol is used as the color reagent, pH optimum and wavelength of maximum absorbance are about 11.5 and 635 nm, respectively--see, C.J. Patton and S.R. Crouch, Anal. Chem. (1977) 49, 464-469. These reaction parameters increase to pH >12.6 and 665 nm when salicylate is used as the color reagent--see, M.D. Krom, Analyst(1980) 105, 305-316.

61 If atomic absorption or ICP instrumentation is not available, the aluminon colorimetric method detailed in the 19th Edition of Standard Methods may be used. This method has poorer precision and bias than the methods of choice.

62 Systea Easy (1-Reagent) Nitrate Method, February 4, 2009. Available at http://www.nemi.gov or from Systea Scientific, LLC., 900 Jorie Blvd., Suite 35, Oak Brook, IL 60523.

63 Hach Method 10360, ``Luminescence Measurement of Dissolved Oxygen (LDO) in Water and Wastewater, Revision 1.1 dated January 4, 2006''. Available from Hach Company, 5600 Lindbergh Drive, Loveland, CO 80539, Telephone: 970-669-3050. This method may be used to measure dissolved oxygen when performing the methods approved in Table IB for measurement of biochemical oxygen demand (BOD) and carbonaceous biochemical oxygen demand (CBOD).

64 In-Situ Method 1002-8-2009, ``Dissolved Oxygen (DO) Measurement by Optical Probe'', 1003-8-2009. Available from In-Situ, Incorporated, 221 E. Lincoln Avenue, Ft. Collins, CO 80524, Telephone: 970-498-1500.

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66 Mitchell Method M5271, ``Determination of Turbidity by Nephlometry'', Revision 1.0, July 31, 2008. Available from Leck Mitchell, Ph.D., P.E., 656 Independence Valley Drive, Grand Junction Colorado 81507, Phone: 630-645-0600.

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68 EPA Method 200.5, Determination of Trace Elements in Drinking Water by Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry, EPA/600/R-06/115. Revision 4.2, October 2003. US EPA.

69 Method 1627, Kinetic Test Method for the Prediction of Mine Drainage Quality, EPA-821-R-09-002. December 2011. USEPA.

70 Techniques and Methods Book 5-B1, Determination of Elements in Natural-Water, Biota, Sediment and Soil Samples Using Collision/Reaction Cell Inductively Coupled Plasma-Mass Spectrometry, Chapter 1, Section B, Methods of the National Water Quality Laboratory, Book 5, Laboratory Analysis,. 2006. USGS.

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