

TABLE OF CONTENTS

	PAGE		
Part 1000 INTRODUCTION			
1010 INTRODUCTION	1-1		
A. Scope and Application of Methods	1-1		
B. Statistics	1-1		
C. Glossary	1-4		
D. Dilution/Concentration Operations	1-5		
1020 QUALITY ASSURANCE	1-6		
A. Introduction	1-6		
B. Quality Control	1-7		
C. Quality Assessment	1-15		
1030 DATA QUALITY	1-16		
A. Introduction	1-16		
B. Measurement Uncertainty	1-16		
C. Method Detection Level	1-20		
D. Data Quality Objectives	1-21		
E. Checking Analyses' Correctness	1-23		
1040 METHOD DEVELOPMENT AND EVALUATION	1-24		
A. Introduction	1-24		
B. Method Validation	1-25		
C. Collaborative Testing	1-26		
1050 EXPRESSION OF RESULTS	1-27		
A. Units	1-27		
B. Significant Figures	1-34		
C. Other Considerations	1-36		
1060 COLLECTION AND PRESERVATION OF SAMPLES	1-37		
A. Introduction	1-37		
B. Collection of Samples	1-39		
C. Sample Storage and Preservation	1-43		
1080 REAGENT WATER	1-46		
A. Introduction	1-46		
B. Methods for Preparing Reagent-Grade Water	1-47		
C. Reagent Water Quality	1-48		
1090 LABORATORY OCCUPATIONAL HEALTH AND SAFETY	1-49		
A. Introduction	1-49		
B. Safe Laboratory Practices	1-50		
C. Laboratory Facility/Fixed Equipment	1-55		
D. Hazard Evaluation	1-56		
E. Personal Protective Equipment	1-57		
F. Worker Protection Medical Program	1-60		
G. Provisions for Work with Particularly Hazardous Substances	1-61		
H. Biological Safety	1-61		
I. Radiological Safety	1-62		
J. Chemical Hygiene Plan	1-65		
K. Mercury Use Avoidance in Laboratory	1-66		
1100 WASTE MINIMIZATION AND DISPOSAL	1-66		
A. Introduction	1-66		
		B. Waste Minimization	1-66
		C. Waste Treatment and Disposal	1-67
		Part 2000 PHYSICAL AND AGGREGATE PROPERTIES	
		2010 INTRODUCTION	2-1
		2020 QUALITY ASSURANCE/QUALITY CONTROL	2-1
		A. Introduction	2-1
		B. Quality Control Practices	2-1
		2110 APPEARANCE	2-5
		2120 COLOR	2-5
		A. Introduction	2-5
		B. Visual Comparison Method	2-6
		C. Spectrophotometric—Single-Wavelength Method (PROPOSED)	2-7
		D. Spectrophotometric—Multi-Wavelength Method	2-8
		E. Tristimulus Spectrophotometric Method	2-9
		F. ADMI Weighted-Ordinate Spectrophotometric Method	2-11
		2130 TURBIDITY	2-12
		A. Introduction	2-12
		B. Nephelometric Method	2-13
		2150 ODOR	2-15
		A. Introduction	2-15
		B. Threshold Odor Test	2-16
		2160 TASTE	2-19
		A. Introduction	2-19
		B. Flavor Threshold Test (FTT)	2-20
		C. Flavor Rating Assessment (FRA)	2-22
		2170 FLAVOR PROFILE ANALYSIS	2-23
		A. Introduction	2-23
		B. Flavor Profile Analysis	2-24
		2310 ACIDITY	2-31
		A. Introduction	2-31
		B. Titration Method	2-31
		2320 ALKALINITY	2-34
		A. Introduction	2-34
		B. Titration Method	2-34
		2330 CALCIUM CARBONATE SATURATION	2-37
		A. Introduction	2-37
		B. Indices Indicating Tendency of a Water to Precipitate or Dissolve CaCO ₃	2-38
		C. Indices Predicting the Quantity of CaCO ₃ That Can Be Precipitated or Dissolved	2-41
		D. Graphical and Computer Methods for CaCO ₃ Indices	2-42

2340	HARDNESS	2-44	B. Oxygen-Consumption Rate	2-88
	A. Introduction	2-44	C. Settled Sludge Volume	2-89
	B. Hardness by Calculation	2-44	D. Sludge Volume Index	2-90
	C. EDTA Titrimetric Method	2-44	E. Zone Settling Rate	2-90
2350	OXIDANT DEMAND/REQUIREMENT	2-47	F. Specific Gravity	2-91
	A. Introduction	2-47	G. Capillary Suction Time	2-92
	B. Chlorine Demand/Requirement	2-48	H. Time-to-Filter	2-93
	C. Chlorine Dioxide Demand/Requirement	2-49	I. Modified Settled Sludge Volume	2-94
	D. Ozone Demand/Requirement— Batch Method	2-50	2720 ANAEROBIC SLUDGE DIGESTER GAS ANALYSIS	2-95
	E. Ozone Demand/Requirement— Semi-Batch Method	2-50	A. Introduction	2-95
2510	CONDUCTIVITY	2-52	B. Volumetric Method	2-96
	A. Introduction	2-52	C. Gas Chromatographic Method	2-97
	B. Laboratory Method	2-54	2810 DISSOLVED GAS SUPERSATURATION	2-100
2520	SALINITY	2-55	A. Introduction	2-100
	A. Introduction	2-55	B. Direct-Sensing Membrane-Diffusion Method	2-100
	B. Electrical Conductivity Method	2-56	Part 3000 METALS	
	C. Density Method	2-57	3010 INTRODUCTION	3-1
	D. Algorithm of Practical Salinity	2-58	A. General Discussion	3-1
2530	FLOATABLES	2-58	B. Sampling and Sample Preservation	3-1
	A. Introduction	2-58	C. General Precautions	3-3
	B. Particulate Floatables	2-59	3020 QUALITY ASSURANCE/QUALITY CONTROL	3-3
	C. Trichlorotrifluoroethane-Soluble Floatable Oil and Grease	2-61	A. Introduction	3-3
2540	SOLIDS	2-62	B. Quality Control Practices	3-4
	A. Introduction	2-62	3030 PRELIMINARY TREATMENT OF SAMPLES	3-6
	B. Total Solids Dried at 103–105°C	2-64	A. Introduction	3-6
	C. Total Dissolved Solids Dried at 180°C	2-65	B. Filtration for Dissolved and Suspended Metals	3-6
	D. Total Suspended Solids Dried at 103–105°C	2-66	C. Treatment for Acid-Extractable Metals	3-7
	E. Fixed and Volatile Solids Ignited at 550°C	2-67	D. Digestion for Metals	3-7
	F. Settleable Solids	2-67	E. Nitric Acid Digestion	3-9
	G. Total, Fixed, and Volatile Solids in Solid and Semisolid Samples	2-68	F. Nitric Acid-Hydrochloric Acid Digestion	3-10
2550	TEMPERATURE	2-69	G. Nitric Acid-Sulfuric Acid Digestion	3-10
	A. Introduction	2-69	H. Nitric Acid-Perchloric Acid Digestion	3-10
	B. Laboratory and Field Methods	2-69	I. Nitric Acid-Perchloric Acid- Hydrofluoric Acid Digestion	3-11
2560	PARTICLE COUNTING AND SIZE DISTRIBUTION	2-70	J. Dry Ashing	3-11
	A. Introduction	2-70	K. Microwave-Assisted Digestion	3-11
	B. Electrical Sensing Zone Method	2-75	3110 METALS BY ATOMIC ABSORPTION SPECTROMETRY.	3-14
	C. Light-Blockage Methods	2-76	3111 METALS BY FLAME ATOMIC ABSORPTION SPECTROMETRY	3-14
	D. Light-Scattering Method	2-77	A. Introduction	3-14
2570	ASBESTOS	2-78	B. Direct Air-Acetylene Flame Method	3-18
	A. Introduction	2-78	C. Extraction/Air-Acetylene Flame Method	3-20
	B. Transmission Electron Microscopy Method	2-79	D. Direct Nitrous Oxide-Acetylene Flame Method	3-21
2580	OXIDATION-REDUCTION POTENTIAL (ORP)	2-84	E. Extraction/Nitrous Oxide-Acetylene Flame Method	3-22
	A. Introduction	2-84	3112 METALS BY COLD-VAPOR ATOMIC ABSORPTION SPECTROMETRY	3-23
	B. Oxidation-Reduction Potential Measurement in Clean Water	2-84		
2710	TESTS ON SLUDGES	2-88		
	A. Introduction	2-88		

	A. Introduction	3-23		A. Introduction	3-82
	B. Cold-Vapor Atomic Absorption Spectrometric Method	3-23		B. Flame Emission Photometric Method	3-83
3113	METALS BY ELECTROTHERMAL ATOMIC ABSORPTION SPECTROMETRY	3-25	3500-Mg	MAGNESIUM	3-84
	A. Introduction	3-25		A. Introduction	3-84
	B. Electrothermal Atomic Absorption Spectrometric Method	3-28	3500-Mn	MANGANESE	3-85
3114	ARSENIC AND SELENIUM BY HYDRIDE GENERATION/ATOMIC ABSORPTION SPECTROMETRY	3-34		A. Introduction	3-85
	A. Introduction	3-34		B. Persulfate Method	3-85
	B. Manual Hydride Generation/Atomic Absorption Spectrometric Method	3-34	3500-K	POTASSIUM	3-87
	C. Continuous Hydride Generation/Atomic Absorption Spectrometric Method	3-38		A. Introduction	3-87
3120	METALS BY PLASMA EMISSION SPECTROSCOPY	3-40		B. Flame Photometric Method	3-87
	A. Introduction	3-40		C. Potassium-Selective Electrode Method	3-88
	B. Inductively Coupled Plasma (ICP) Method	3-40	3500-Se	SELENIUM	3-89
3125	METALS BY INDUCTIVELY COUPLED PLASMA-MASS SPECTROMETRY	3-46		A. Introduction	3-89
	A. Introduction	3-46		B. Sample Preparation	3-91
	B. Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) Method	3-47		C. Colorimetric Method	3-93
3130	METALS BY ANODIC STRIPPING VOLTAMMETRY	3-57		D. Determination of Volatile Selenium	3-94
	A. Introduction	3-57		E. Determination of Nonvolatile Organic Selenium Compounds	3-95
	B. Determination of Lead, Cadmium, and Zinc	3-57	3500-Na	SODIUM	3-96
3500-Al	ALUMINUM	3-61		A. Introduction	3-96
	A. Introduction	3-61		B. Flame Emission Photometric Method	3-97
	B. Eriochrome Cyanine R Method	3-61	3500-Sr	STRONTIUM	3-98
3500-As	ARSENIC	3-64		A. Introduction	3-98
	A. Introduction	3-64		B. Flame Emission Photometric Method	3-99
	B. Silver Diethyldithiocarbamate Method	3-65	3500-V	VANADIUM	3-100
3500-Ca	CALCIUM	3-67		A. Introduction	3-100
	A. Introduction	3-67		B. Gallic Acid Method	3-101
	B. EDTA Titrimetric Method	3-67	3500-Zn	ZINC	3-102
3500-Cr	CHROMIUM	3-68		A. Introduction	3-102
	A. Introduction	3-68		B. Zincon Method	3-102
	B. Colorimetric Method	3-69	3500	OTHER METALS	3-104
	C. Ion Chromatographic Method	3-71	3500-Sb	Antimony	3-104
3500-Cu	COPPER	3-73	3500-Ba	Barium	3-104
	A. Introduction	3-73	3500-Be	Beryllium	3-104
	B. Neocuproine Method	3-74	3500-Bi	Bismuth	3-105
	C. Bathocuproine Method	3-75	3500-B	Boron	3-105
3500-Fe	IRON	3-76	3500-Cd	Cadmium	3-105
	A. Introduction	3-76	3500-Cs	Cesium	3-105
	B. Phenanthroline Method	3-77	3500-Co	Cobalt	3-106
3500-Pb	LEAD	3-80	3500-Ga	Gallium	3-106
	A. Introduction	3-80	3500-Ge	Germanium	3-106
	B. Dithizone Method	3-81	3500-Au	Gold	3-107
3500-Li	LITHIUM	3-82	3500-In	Indium	3-107
			3500-Ir	Iridium	3-107
			3500-Hg	Mercury	3-107
			3500-Mo	Molybdenum	3-108
			3500-Ni	Nickel	3-108
			3500-Os	Osmium	3-108
			3500-Pd	Palladium	3-109
			3500-Pt	Platinum	3-109
			3500-Re	Rhenium	3-109
			3500-Rh	Rhodium	3-109
			3500-Ru	Ruthenium	3-110
			3500-Ag	Silver	3-110

3500-Te	Tellurium	3-110			
3500-Tl	Thallium	3-111			
3500-Th	Thorium	3-111			
3500-Sn	Tin	3-111			
3500-Ti	Titanium	3-111			
3500-U	Uranium	3-112			
Part 4000	INORGANIC NONMETALLIC				
	CONSTITUENTS				
4010	INTRODUCTION	4-1			
4020	QUALITY ASSURANCE/QUALITY CONTROL	4-1			
	A. Introduction	4-1			
	B. Quality Control Practices	4-1			
4110	DETERMINATION OF ANIONS BY ION				
	CHROMATOGRAPHY	4-5			
	A. Introduction	4-5			
	B. Ion Chromatography with Chemical				
	Suppression of Eluent Conductivity	4-5			
	C. Single-Column Ion Chromatography				
	with Direct Conductivity Detection	4-8			
	D. Ion Chromatographic Determination of				
	Oxyhalides and Bromide	4-9			
4120	SEGMENTED CONTINUOUS FLOW ANALYSIS	4-13			
	A. Introduction	4-13			
	B. Segmented Flow Analysis Method	4-13			
4130	INORGANIC NONMETALS BY FLOW INJECTION				
	ANALYSIS	4-15			
	A. Introduction	4-15			
	B. Quality Control	4-15			
4140	INORGANIC ANIONS BY CAPILLARY ION				
	ELECTROPHORESIS	4-16			
	A. Introduction	4-16			
	B. Capillary Ion Electrophoresis with				
	Indirect UV Detection	4-16			
4500-B	BORON	4-25			
	A. Introduction	4-25			
	B. Curcumin Method	4-25			
	C. Carmine Method	4-27			
4500-Br ⁻	BROMIDE	4-28			
	A. Introduction	4-28			
	B. Phenol Red Colorimetric Method	4-28			
	C. (Reserved)	4-29			
	D. Flow Injection Analysis	4-29			
4500-CO ₂	CARBON DIOXIDE	4-30			
	A. Introduction	4-30			
	B. Nomographic Determination of Free				
	Carbon Dioxide and the Three Forms				
	of Alkalinity.	4-31			
	C. Titrimetric Method for Free Carbon				
	Dioxide	4-31			
	D. Carbon Dioxide and Forms of Alkalinity				
	by Calculation	4-36			
4500-CN ⁻	CYANIDE	4-37			
	A. Introduction	4-37			
	B. Preliminary Treatment of Samples	4-39			
	C. Total Cyanide after Distillation	4-41			
	D. Titrimetric Method	4-43			
	E. Colorimetric Method	4-44			
	F. Cyanide-Selective Electrode Method	4-45			
	G. Cyanides Amenable to Chlorination				
	after Distillation	4-46			
	H. Cyanides Amenable to Chlorination				
	without Distillation (Short-Cut				
	Method)	4-48			
	I. Weak Acid Dissociable Cyanide	4-49			
	J. Cyanogen Chloride	4-50			
	K. Spot Test for Sample Screening	4-51			
	L. Cyanates	4-52			
	M. Thiocyanate	4-53			
	N. Total Cyanide after Distillation, by				
	Flow Injection Analysis	4-55			
	O. Total Cyanide and Weak Acid				
	Dissociable Cyanide by Flow				
	Injection Analysis	4-57			
4500-Cl	CHLORINE (RESIDUAL)	4-58			
	A. Introduction	4-58			
	B. Iodometric Method I	4-60			
	C. Iodometric Method II	4-62			
	D. Amperometric Titration Method	4-64			
	E. Low-Level Amperometric Titration				
	Method	4-66			
	F. DPD Ferrous Titrimetric Method	4-66			
	G. DPD Colorimetric Method	4-69			
	H. Syringaldazine (FACTS) Method	4-70			
	I. Iodometric Electrode Technique	4-71			
4500-Cl ⁻	CHLORIDE	4-72			
	A. Introduction	4-72			
	B. Argentometric Method	4-72			
	C. Mercuric Nitrate Method	4-73			
	D. Potentiometric Method	4-75			
	E. Automated Ferricyanide Method	4-76			
	F. (Reserved)	4-77			
	G. Mercuric Thiocyanate Flow Injection				
	Analysis	4-77			
4500-ClO ₂	CHLORINE DIOXIDE	4-79			
	A. Introduction	4-79			
	B. Iodometric Method	4-79			
	C. Amperometric Method I	4-80			
	D. (Reserved)	4-81			
	E. Amperometric Method II	4-81			
4500-F ⁻	FLUORIDE	4-83			
	A. Introduction	4-83			
	B. Preliminary Distillation Step	4-84			
	C. Ion-Selective Electrode Method	4-85			
	D. SPADNS Method	4-87			
	E. Complexone Method	4-88			
	F. (Reserved)	4-89			
	G. Ion-Selective Electrode Flow Injection				
	Analysis	4-89			

4500-H ⁺	pH VALUE	4-91	C. Semi-Micro-Kjeldahl Method	4-134
	A. Introduction	4-91	D. Block Digestion and Flow Injection	
	B. Electrometric Method	4-92	Analysis	4-135
4500-I	IODINE	4-96	4500-O OXYGEN (DISSOLVED)	4-137
	A. Introduction	4-96	A. Introduction	4-137
	B. Leuco Crystal Violet Method	4-97	B. Iodometric Methods	4-137
	C. Amperometric Titration Method	4-98	C. Azide Modification	4-139
4500-I ⁻	IODIDE	4-99	D. Permanganate Modification	4-140
	A. Introduction	4-99	E. Alum Flocculation Modification	4-142
	B. Leuco Crystal Violet Method	4-99	F. Copper Sulfate-Sulfamic Acid	
	C. Catalytic Reduction Method	4-100	Flocculation Modification	4-142
	D. Voltammetric Method	4-101	G. Membrane Electrode Method	4-143
4500-IO ₃ ⁻	IODATE	4-103	4500-O ₃ OZONE (RESIDUAL)	4-145
	A. Introduction	4-103	A. Introduction	4-145
	B. Polarographic Method	4-103	B. Indigo Colorimetric Method	4-145
4500-N	NITROGEN	4-104	4500-P PHOSPHORUS	4-148
	A. Introduction	4-104	A. Introduction	4-148
	B. In-Line UV/Persulfate Digestion and		B. Sample Preparation	4-151
	Oxidation with Flow Injection		C. Vanadomolybdophosphoric Acid	
	Analysis	4-105	Colorimetric Method	4-153
	C. Persulfate Method	4-107	D. Stannous Chloride Method	4-154
	D. Conductimetric Determination of		E. Ascorbic Acid Method	4-155
	Inorganic Nitrogen	4-108	F. Automated Ascorbic Acid Reduction	
			Method	4-156
4500-NH ₃	NITROGEN (AMMONIA)	4-110	G. Flow Injection Analysis for	
	A. Introduction	4-110	Orthophosphate	4-157
	B. Preliminary Distillation Step	4-110	H. Manual Digestion and Flow Injection	
	C. Titrimetric Method	4-112	Analysis for Total Phosphorus	4-159
	D. Ammonia-Selective Electrode Method	4-113	I. In-line UV/Persulfate Digestion and	
	E. Ammonia-Selective Electrode Method		Flow Injection Analysis for Total	
	Using Known Addition	4-114	Phosphorus	4-160
	F. Phenate Method	4-115	J. Persulfate Method for Simultaneous	
	G. Automated Phenate Method	4-116	Determination of Total Nitrogen and	
	H. Flow Injection Analysis	4-118	Total Phosphorus	4-162
4500-NO ₂ ⁻	NITROGEN (NITRITE)	4-120	4500-KMnO ₄ POTASSIUM PERMANGANATE	4-164
	A. Introduction	4-120	A. Introduction	4-164
	B. Colorimetric Method	4-120	B. Spectrophotometric Method	4-164
4500-NO ₃ ⁻	NITROGEN (NITRATE)	4-122	4500-SiO ₂ SILICA	4-165
	A. Introduction	4-122	A. Introduction	4-165
	B. Ultraviolet Spectrophotometric		B. (Reserved)	4-167
	Screening Method	4-122	C. Molybdosilicate Method	4-167
	C. Second-Derivative Ultraviolet		D. Heteropoly Blue Method	4-169
	Spectrophotometric Method		E. Automated Method for Molybdate-	
	(PROPOSED)	4-123	Reactive Silica	4-170
	D. Nitrate Electrode Method	4-124	F. Flow Injection Analysis for Molybdate-	
	E. Cadmium Reduction Method	4-125	Reactive Silicate	4-171
	F. Automated Cadmium Reduction		4500-S ²⁻ SULFIDE	4-172
	Method	4-127	A. Introduction	4-172
	G. (Reserved)	4-128	B. Separation of Soluble and Insoluble	
	H. Automated Hydrazine Reduction		Sulfides	4-174
	Method	4-128	C. Sample Pretreatment to Remove	
	I. Cadmium Reduction Flow Injection		Interfering Substances or to	
	Method	4-129	Concentrate the Sulfide	4-175
4500-N _{org}	NITROGEN (ORGANIC)	4-131	D. Methylene Blue Method	4-175
	A. Introduction	4-131		
	B. Macro-Kjeldahl Method	4-132		

E. Gas Dialysis, Automated Methylene Blue Method	4-177	5510 AQUATIC HUMIC SUBSTANCES	5-35
F. Iodometric Method	4-178	A. Introduction	5-35
G. Ion-Selective Electrode Method	4-179	B. Diethylaminoethyl (DEAE) Method	5-36
H. Calculation of Un-ionized Hydrogen Sulfide	4-181	C. XAD Method	5-37
I. Distillation, Methylene Blue Flow Injection Analysis Method	4-183	5520 OIL AND GREASE	5-38
J. Acid-Volatile Sulfide	4-184	A. Introduction	5-38
4500-SO ₃ ²⁻ SULFITE	4-185	B. Liquid-Liquid, Partition-Gravimetric Method	5-40
A. Introduction	4-185	C. Partition-Infrared Method	5-41
B. Iodometric Method	4-186	D. Soxhlet Extraction Method	5-42
C. Phenanthroline Method	4-187	E. Extraction Method for Sludge Samples	5-43
4500-SO ₄ ²⁻ SULFATE	4-188	F. Hydrocarbons	5-44
A. Introduction	4-188	G. Solid-Phase, Partition-Gravimetric Method	5-45
B. (Reserved)	4-189	5530 PHENOLS	5-46
C. Gravimetric Method with Ignition of Residue	4-189	A. Introduction	5-46
D. Gravimetric Method with Drying of Residue	4-190	B. Cleanup Procedure	5-47
E. Turbidimetric Method	4-190	C. Chloroform Extraction Method	5-47
F. Automated Methylthymol Blue Method	4-191	D. Direct Photometric Method	5-49
G. Methylthymol Blue Flow Injection Analysis	4-193	5540 SURFACTANTS	5-50
Part 5000 AGGREGATE ORGANIC CONSTITUENTS		A. Introduction	5-50
5010 INTRODUCTION	5-1	B. Surfactant Separation by Sublation	5-51
A. General Discussion	5-1	C. Anionic Surfactants as MBAS	5-53
B. Sample Collection and Preservation	5-1	D. Nonionic Surfactants as CTAS	5-55
5020 QUALITY ASSURANCE/QUALITY CONTROL	5-1	5550 TANNIN AND LIGNIN	5-58
A. Introduction	5-1	A. Introduction	5-58
B. Quality Control Practices	5-2	B. Colorimetric Method	5-58
5210 BIOCHEMICAL OXYGEN DEMAND (BOD)	5-4	5560 ORGANIC AND VOLATILE ACIDS	5-59
A. Introduction	5-4	A. Introduction	5-59
B. 5-Day BOD Test	5-5	B. Chromatographic Separation Method for Organic Acids	5-59
C. Ultimate BOD Test	5-10	C. Distillation Method	5-61
D. Respirometric Method	5-13	D. Gas Chromatographic Method	5-62
5220 CHEMICAL OXYGEN DEMAND (COD)	5-16	5710 FORMATION OF TRIHALOMETHANES AND OTHER DISINFECTION BY-PRODUCTS	5-64
A. Introduction	5-16	A. Introduction	5-64
B. Open Reflux Method	5-17	B. Trihalomethane Formation Potential (THMFP)	5-67
C. Closed Reflux, Titrimetric Method	5-19	C. Simulated Distribution System Trihalomethanes (SDS-THM)	5-71
D. Closed Reflux, Colorimetric Method	5-20	D. Formation of Other Disinfection By-Products (DBPs)	5-72
5310 TOTAL ORGANIC CARBON (TOC)	5-21	5910 UV-ABSORBING ORGANIC CONSTITUENTS	5-74
A. Introduction	5-21	A. Introduction	5-74
B. High-Temperature Combustion Method	5-23	B. Ultraviolet Absorption Method	5-75
C. Persulfate-Ultraviolet or Heated-Persulfate Oxidation Method	5-25	Part 6000 INDIVIDUAL ORGANIC COMPOUNDS	
D. Wet-Oxidation Method	5-28	6010 INTRODUCTION	6-1
5320 DISSOLVED ORGANIC HALOGEN	5-29	A. General Discussion	6-1
A. Introduction	5-29	B. Sample Collection and Preservation	6-3
B. Adsorption-Pyrolysis-Titrimetric Method	5-29	C. Analytical Methods	6-4
		6020 QUALITY ASSURANCE/QUALITY CONTROL	6-6
		A. Introduction	6-6
		B. Quality Control Practices	6-7

6040	CONSTITUENT CONCENTRATION BY GAS	
	EXTRACTION	6-11
	A. Introduction	6-11
	B. Closed-Loop Stripping, Gas Chromatographic/Mass Spectrometric Analysis	6-11
	C. Purge and Trap Technique	6-22
	D. Solid-Phase Microextraction (SPME)	6-22
	E. Solid-Phase Microextraction (SPME) with CI GC/MS/MS	6-25
6200	VOLATILE ORGANIC COMPOUNDS	6-30
	A. Introduction	6-30
	B. Purge and Trap Capillary-Column Gas Chromatographic/Mass Spectrometric Method	6-33
	C. Purge and Trap Capillary-Column Gas Chromatographic Method	6-38
6211	METHANE	6-43
	A. Introduction	6-43
	B. Combustible-Gas Indicator Method	6-43
	C. Volumetric Method	6-45
6231	1,2-DIBROMOETHANE (EDB) AND 1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	6-45
	A. Introduction	6-45
	B. Liquid-Liquid Extraction Gas Chromatographic Method	6-45
	C. Purge and Trap Gas Chromatographic/Mass Spectrometric Method	6-48
	D. Purge and Trap Gas Chromatographic Method	6-48
6232	TRIHALOMETHANES AND CHLORINATED ORGANIC SOLVENTS	6-48
	A. Introduction	6-48
	B. Liquid-Liquid Extraction Gas Chromatographic Method	6-49
	C. Purge and Trap Gas Chromatographic/Mass Spectrometric Method	6-54
	D. Purge and Trap Gas Chromatographic Method	6-54
6251	DISINFECTION BY-PRODUCTS: HALOACETIC ACIDS AND TRICHLOROPHENOL	6-55
	A. Introduction	6-55
	B. Micro Liquid-Liquid Extraction Gas Chromatographic Method	6-55
6252	DISINFECTION BY-PRODUCTS: ALDEHYDES (PROPOSED)	6-65
	A. Introduction	6-65
	B. PFBHA Liquid-Liquid Extraction Gas Chromatographic Method	6-66
6410	EXTRACTABLE BASE/NEUTRALS AND ACIDS	6-73
	A. Introduction	6-73
	B. Liquid-Liquid Extraction Gas Chromatographic/Mass Spectrometric Method	6-74
6420	PHENOLS	6-87
	A. Introduction	6-87
	B. Liquid-Liquid Extraction Gas Chromatographic Method	6-87
	C. Liquid-Liquid Extraction Gas Chromatographic/Mass Spectrometric Method	6-93
6431	POLYCHLORINATED BIPHENYLS (PCBs)	6-93
	A. Introduction	6-93
	B. Liquid-Liquid Extraction Gas Chromatographic Method	6-93
	C. Liquid-Liquid Extraction Gas Chromatographic/Mass Spectrometric Method	6-93
6440	POLYNUCLEAR AROMATIC HYDROCARBONS	6-93
	A. Introduction	6-93
	B. Liquid-Liquid Extraction Gas Chromatographic Method	6-94
	C. Liquid-Liquid Extraction Gas Chromatographic/Mass Spectrometric Method	6-99
6450	NITROSAMINES	6-99
	A. Introduction	6-99
	B. Carbonaceous-Resin Solid-Phase Extraction GC/MS Method	6-100
	C. Micro Liquid-Liquid Extraction GC/MS Method	6-109
6610	CARBAMATE PESTICIDES	6-112
	A. Introduction	6-112
	B. High-Performance Liquid Chromatographic Method	6-113
6630	ORGANOCHLORINE PESTICIDES	6-121
	A. Introduction	6-121
	B. Liquid-Liquid Extraction Gas Chromatographic Method I	6-121
	Appendix—Standardization of Magnesia-Silica Gel Column by Weight Adjustment Based on Adsorption of Lauric Acid	6-127
	C. Liquid-Liquid Extraction Gas Chromatographic Method II	6-128
	D. Liquid-Liquid Extraction Gas Chromatographic/Mass Spectrometric Method	6-135
6640	ACIDIC HERBICIDE COMPOUNDS	6-135
	A. Introduction	6-135
	B. Micro Liquid-Liquid Extraction Gas Chromatographic Method	6-136
6651	GLYPHOSATE HERBICIDE	6-146
	A. Introduction	6-146
	B. Liquid Chromatographic Post-Column Fluorescence Method	6-147
6710	TRIBUTYL TIN	6-149
	A. Introduction	6-149
	B. Gas Chromatographic/Mass Spectrometric Method	6-149

	C. Gas Chromatographic/Flame Photometric Detector Method	6-154		A. Introduction	7-52
				B. Precipitation Method	7-53
			7500- ³ H	TRITIUM	7-56
				A. Introduction	7-56
				B. Liquid Scintillation Spectrometric Method	7-56
			7500-U	URANIUM	7-58
				A. Introduction	7-58
				B. Radiochemical Method	7-58
				C. Isotopic Method	7-60
Part 7000	RADIOACTIVITY		Part 8000	TOXICITY	
7010	INTRODUCTION	7-1	8010	INTRODUCTION	8-1
	A. General Discussion	7-1		A. General Discussion	8-1
	B. Sample Collection and Preservation	7-2		B. Terminology	8-2
7020	QUALITY SYSTEM	7-3		C. Basic Requirements	8-3
	A. Quality Systems/Quality Assurance/Quality Control Program	7-3		D. Conducting Toxicity Tests	8-4
	B. Quality Control for Wastewater Samples	7-8		E. Preparing Organisms for Toxicity Tests	8-7
	C. Statistics	7-8		F. Toxicity Test Systems, Materials, and Procedures	8-15
	D. Calculation and Expression of Results	7-11		G. Calculating, Analyzing, and Reporting Results of Toxicity Tests	8-20
7030	COUNTING INSTRUMENTS	7-12		H. Interpreting and Applying Results of Toxicity Tests	8-24
	A. Introduction	7-12		I. Selected Toxicological Literature	8-25
	B. Description and Operation of Instruments	7-12	8020	QUALITY ASSURANCE AND QUALITY CONTROL IN LABORATORY TOXICITY TESTS	8-26
7040	FACILITIES	7-18		A. General Discussion	8-26
	A. Counting Room	7-18		B. Elements of QA/QC	8-27
	B. Radiochemistry Laboratory	7-18	8030	MUTAGENESIS	8-30
	C. Laboratory Safety	7-19		A. Introduction	8-30
	D. Pollution Prevention	7-19		B. <i>Salmonella</i> Microsomal Mutagenicity Test	8-32
	E. Waste Management	7-19	8050	BACTERIAL BIOLUMINESCENCE	8-38
7110	GROSS ALPHA AND GROSS BETA RADIOACTIVITY (TOTAL, SUSPENDED, AND DISSOLVED)	7-20		A. Introduction	8-38
	A. Introduction	7-20		B. Bacterial Bioluminescence Test	8-38
	B. Evaporation Method for Gross Alpha- Beta	7-20	8070	P450 REPORTER GENE RESPONSE TO DIOXIN-LIKE ORGANIC COMPOUNDS	8-41
	C. Coprecipitation Method for Gross Alpha Radioactivity in Drinking Water	7-23		A. Introduction	8-41
7120	GAMMA-EMITTING RADIONUCLIDES	7-25		B. The P450 RGS Test	8-41
	A. Introduction	7-25	8071	COMET/SINGLE-CELL GEL ELECTROPHORESIS ASSAY FOR DETECTION OF DNA DAMAGE	8-43
	B. Gamma Spectroscopic Method	7-25		A. Introduction	8-43
7500-Cs	RADIOACTIVE CESIUM	7-29		B. Comet/Single-Cell Gel Electrophoresis Assay	8-44
	A. Introduction	7-29	8080	SEDIMENT POREWATER TESTING	8-47
	B. Precipitation Method	7-29		A. Introduction	8-47
7500-I	RADIOACTIVE IODINE	7-30		B. Sediment Collection and Storage	8-48
	A. Introduction	7-30		C. Extraction of Sediment Pore Water	8-48
	B. Precipitation Method	7-30		D. Toxicity Testing Procedures	8-50
	C. Ion-Exchange Method	7-31	8110	ALGAE	8-52
	D. Distillation Method	7-32	8111	BIOSTIMULATION (ALGAL PRODUCTIVITY)	8-52
7500-Ra	RADIUM	7-34		A. General Principles	8-52
	A. Introduction	7-34			
	B. Precipitation Method	7-34			
	C. Emanation Method	7-37			
	D. Sequential Precipitation Method	7-42			
	E. Gamma Spectroscopy Method	7-44			
7500-Rn	RADON	7-49			
	A. Introduction	7-49			
	B. Liquid Scintillation Method	7-50			
7500-Sr	TOTAL RADIOACTIVE STRONTIUM AND STRONTIUM-90	7-52			

B. Planning and Evaluating Algal Assays	8-53	<i>Pristina leidyi</i> , <i>Tubifex tubifex</i> , and <i>Lumbriculus variegatus</i>	8-94
C. Apparatus	8-54	G. Data Evaluation	8-95
D. Sample Handling	8-54	8610 MOLLUSKS	8-96
E. Synthetic Algal Culture Medium	8-55	A. Introduction	8-96
F. Inoculum	8-55	B. Selecting and Preparing Test Organisms	8-96
G. Test Conditions and Procedures	8-56	C. Short-Term Test Procedures Using Marine Mollusk Larvae	8-98
H. Effect of Additions	8-57	D. Sediment Test Procedures Using Marine Bivalves	8-100
I. Data Analysis and Interpretation	8-57	E. Field Test Procedures Using Freshwater and Marine Bivalves	8-101
8112 PHYTOPLANKTON	8-58	8710 ARTHROPODS	8-105
A. Introduction	8-58	8711 DAPHNIA	8-105
B. Inoculum	8-58	A. Introduction	8-105
C. Test Conditions and Procedures	8-58	B. Selecting and Preparing Test Organisms	8-107
8113 MARINE MACROALGAE	8-59	C. Toxicity Test Procedures	8-108
A. Introduction	8-59	8712 CERIODAPHNIA	8-110
B. Selecting and Preparing <i>Macrocystis</i> <i>pyrifera</i> Sporophylls	8-60	A. Introduction	8-110
C. Toxicity Test Procedures	8-62	B. Selecting and Preparing Test Organisms	8-111
D. Data Evaluation	8-64	C. Toxicity Test Procedures	8-113
8200 AQUATIC FLOWERING PLANTS	8-64	8714 MYSIDS	8-115
8211 DUCKWEED	8-65	A. Introduction	8-115
A. Introduction	8-65	B. Selecting and Preparing Test Organisms	8-116
B. Selecting and Preparing Test Organisms	8-66	C. Toxicity Test Procedures	8-121
C. Toxicity Test Procedure	8-67	8740 DECAPODS	8-125
8220 AQUATIC EMERGENT PLANTS	8-69	A. Introduction	8-125
A. Introduction	8-69	B. Selecting and Preparing Test Organisms	8-125
B. Selecting and Preparing Test Organisms	8-70	C. Toxicity Test Procedures	8-132
C. Toxicity Test Procedure	8-71	D. Data Evaluation	8-136
8310 CILIATED PROTOZOA	8-73	8750 AQUATIC INSECTS	8-136
A. Introduction	8-73	A. Introduction	8-136
B. Growth Inhibition Test with Freshwater Ciliate <i>Colpidium campylum</i>	8-73	B. Selecting and Preparing Test Organisms	8-137
C. Chemotactic Test with Freshwater Ciliate <i>Tetrahymena thermophila</i>	8-75	C. Toxicity Test Procedures	8-139
D. Growth Inhibition Test with the Soil Ciliate <i>Colpoda inflata</i>	8-77	D. Data Evaluation	8-140
8420 ROTIFERS	8-79	8810 ECHINODERM FERTILIZATION AND DEVELOPMENT	8-141
A. Introduction	8-79	A. Introduction	8-141
B. Selecting and Preparing Test Organisms	8-80	B. Selecting and Preparing Test Organisms	8-142
C. Toxicity Test Procedures	8-81	C. Echinoderm Fertilization Test	8-143
8510 ANNELIDS	8-83	D. Echinoderm Embryo Development Test	8-148
A. Introduction	8-83	8910 FISH	8-150
B. Selecting and Preparing Test Organisms	8-83	A. Introduction	8-150
C. Toxicity Test Procedures	8-89	B. Fish Selection and Culture Procedures	8-151
D. Sediment Test Procedures Using the Marine Polychaete <i>Neanthes</i> <i>arenaceodentata</i>	8-91	C. Toxicity Test Procedures	8-155
E. Sediment Test Procedures Using the Marine Polychaete <i>Polydora cornuta</i>	8-93	8921 FATHEAD MINNOW	8-161
F. Sediment Test Procedures Using the Freshwater and Marine Oligochaetes		A. Introduction	8-161

	B. Culture and Maintenance of Test Organisms	8-162		A. Introduction	9-59
	C. Toxicity Test Procedures	8-163		B. <i>Pseudomonas fluorescens</i> Strain P-17, <i>Spirillum</i> Strain NOX Method	9-61
8930	AMPHIBIANS (PROPOSED)	8-170	9218	AEROBIC ENDOSPORES	9-64
	A. Introduction	8-170		A. Introduction	9-64
	B. Culture and Maintenance of Test Organisms	8-171		B. Membrane Filter Method	9-64
	C. Toxicity Test Procedures	8-174	9221	MULTIPLE-TUBE FERMENTATION TECHNIQUE FOR MEMBERS OF THE COLIFORM GROUP	9-65
Part 9000	MICROBIOLOGICAL EXAMINATION			A. Introduction	9-65
9010	INTRODUCTION	9-1		B. Standard Total Coliform Fermentation Technique	9-66
9020	QUALITY ASSURANCE/QUALITY CONTROL	9-2		C. Estimation of Bacterial Density	9-69
	A. Introduction	9-2		D. Presence–Absence (P–A) Coliform Test	9-73
	B. Intralaboratory Quality Control Guidelines	9-4		E. Fecal Coliform Procedure	9-74
	C. Interlaboratory Quality Control	9-25		F. <i>Escherichia coli</i> Procedure Using Fluorogenic Substrate	9-75
9030	LABORATORY APPARATUS	9-26		G. Other <i>Escherichia coli</i> Procedures (PROPOSED)	9-76
	A. Introduction	9-26	9222	MEMBRANE FILTER TECHNIQUE FOR MEMBERS OF THE COLIFORM GROUP	9-77
	B. Equipment Specifications	9-26		A. Introduction	9-77
9040	WASHING AND STERILIZATION	9-30		B. Standard Total Coliform Membrane Filter Procedure	9-78
9050	PREPARATION OF CULTURE MEDIA	9-31		C. Delayed-Incubation Total Coliform Procedure	9-84
	A. General Procedures	9-31		D. Thermotolerant (Fecal) Coliform Membrane Filter Procedure	9-85
	B. Water	9-32		E. Delayed-Incubation Thermotolerant (Fecal) Coliform Procedure	9-87
	C. Media Specifications	9-32		F. <i>Klebsiella</i> Membrane Filter Procedure	9-88
9060	SAMPLES	9-33		G. MF Partition Procedures	9-89
	A. Collection	9-33		H. Simultaneous Detection of Total Coliform and <i>E. coli</i> by Dual–Chromogen Membrane Filter Procedure (PROPOSED)	9-90
	B. Preservation and Storage	9-35		I. Simultaneous Detection of Total Coliform and <i>E. coli</i> by Fluorogen/Chromogen Membrane Filter Procedure (PROPOSED)	9-91
9211	RAPID DETECTION METHODS	9-36	9223	ENZYME SUBSTRATE COLIFORM TEST	9-93
	A. Introduction	9-36		A. Introduction	9-93
	B. Seven-Hour Fecal Coliform Test	9-36		B. Enzyme Substrate Test	9-93
	C. Special Techniques	9-37	9224	DETECTION OF COLIPHAGES	9-95
9212	STRESSED MICROORGANISMS	9-39		A. Introduction	9-95
	A. Introduction	9-39		B. Somatic Coliphage Assay	9-96
	B. Recovery Enhancement	9-40		C. Male-Specific Coliphage Assay Using <i>Escherichia coli</i> Famp	9-98
9213	RECREATIONAL WATERS	9-42		D. Male-Specific Coliphage Assay Using <i>Salmonella typhimurium</i> WG49	9-99
	A. Introduction	9-42		E. Single-Agar-Layer Method	9-101
	B. Swimming Pools	9-43		F. Membrane Filter Method	9-102
	C. Whirlpools	9-45	9225	DIFFERENTIATION OF COLIFORM BACTERIA	9-103
	D. Natural Bathing Beaches	9-46		A. Introduction	9-103
	E. Membrane Filter Technique for <i>Pseudomonas aeruginosa</i>	9-48		B. Culture Purification	9-104
	F. Multiple-Tube Technique for <i>Pseudomonas aeruginosa</i>	9-49			
9215	HETEROTROPHIC PLATE COUNT	9-49			
	A. Introduction	9-49			
	B. Pour Plate Method	9-52			
	C. Spread Plate Method	9-54			
	D. Membrane Filter Method	9-56			
	E. Enzyme Substrate Method	9-57			
9216	DIRECT TOTAL MICROBIAL COUNT	9-57			
	A. Introduction	9-57			
	B. Epifluorescence Microscopic Method Using Acridine Orange	9-58			
9217	ASSIMILABLE ORGANIC CARBON	9-59			

C. Identification	9-105	9610 DETECTION OF FUNGI	9-201
D. Media, Reagents, and Procedures	9-107	A. Introduction	9-201
E. Reporting Results	9-110	B. Pour Plate Technique	9-204
9230 FECAL ENTEROCOCCUS/STREPTOCOCCUS		C. Spread Plate Technique	9-205
GROUPS	9-110	D. Membrane Filter Technique	9-206
A. Introduction	9-110	E. Technique for Yeasts	9-207
B. Multiple-Tube Technique	9-111	F. Zoosporic Fungi	9-207
C. Membrane Filter Techniques	9-112	G. Aquatic Hyphomycetes	9-208
D. Fluorogenic Substrate Enterococcus		H. Fungi Pathogenic to Humans	9-209
Test	9-115	9711 PATHOGENIC PROTOZOA	9-210
9240 IRON AND SULFUR BACTERIA	9-116	A. Introduction	9-210
A. Introduction	9-116	B. Detection of <i>Giardia</i> and	
B. Iron Bacteria	9-117	<i>Cryptosporidium</i> in Water	9-215
C. Sulfur Bacteria	9-122	C. Detection of <i>Giardia</i> and	
D. Enumerating, Enriching, and Isolating		<i>Cryptosporidium</i> in Wastewater	9-221
Iron and Sulfur Bacteria	9-124	D. Infectivity of <i>Cryptosporidium</i> in Cell	
E. Bacteria Living in Acidic		Culture	9-222
Environments	9-130		
9245 NITRIFYING BACTERIA	9-135	Part 10000 BIOLOGICAL EXAMINATION	
A. Introduction	9-135	10010 INTRODUCTION	10-1
B. Multiple-Tube Method	9-137	10200 PLANKTON	10-2
9250 DETECTION OF ACTINOMYCETES	9-138	A. Introduction	10-2
A. Introduction	9-138	B. Sample Collection	10-3
B. Actinomycete Plate Count	9-140	C. Concentration Techniques	10-11
9260 DETECTION OF PATHOGENIC BACTERIA	9-142	D. Preparing Slide Mounts	10-13
A. Introduction	9-142	E. Microscopes and Calibrations	10-15
B. <i>Salmonella</i>	9-145	F. Phytoplankton Counting Techniques	10-17
C. (Reserved)	9-150	G. Zooplankton Counting Techniques	10-21
D. (Reserved)	9-150	H. Chlorophyll	10-22
E. <i>Shigella</i>	9-150	I. Determination of Biomass (Standing	
F. Diarrheagenic <i>Escherichia coli</i>	9-153	Crop)	10-30
G. <i>Campylobacter</i>	9-158	J. Metabolic Rate Measurements	10-32
H. <i>Vibrio</i>	9-160	10300 PERIPHYTON	10-36
I. <i>Leptospira</i>	9-166	A. Introduction	10-36
J. <i>Legionella</i>	9-169	B. Sample Collection	10-36
K. <i>Yersinia enterocolitica</i>	9-174	C. Sample Analysis	10-38
L. <i>Aeromonas</i>	9-177	D. Primary Productivity	10-41
M. <i>Mycobacterium</i>	9-180	E. Interpreting and Reporting Results	10-50
9510 DETECTION OF ENTERIC VIRUSES	9-184	10400 MACROPHYTES	10-52
A. Introduction	9-184	A. Introduction	10-52
B. Virus Concentration from Small Sample		B. Preliminary Survey	10-53
Volumes by Adsorption to and		C. Vegetation Mapping Methods	10-53
Elution from Microporous Filters	9-186	D. Population Estimates	10-55
C. Virus Concentration from Large Sample		E. Productivity	10-59
Volumes by Adsorption to and		10500 BENTHIC MACROINVERTEBRATES	10-67
Elution from Microporous Filters	9-189	A. Introduction	10-67
D. Virus Concentration by Aluminum		B. Sample Collection	10-70
Hydroxide Adsorption-Precipitation	9-193	C. Sample Processing and Analysis	10-79
E. Hydroextraction-Dialysis with		D. Data Evaluation, Presentation, and	
Polyethylene Glycol	9-195	Conclusions	10-81
F. Recovery of Viruses from Suspended		10600 FISHES	10-84
Solids in Water and Wastewater	9-196	A. Introduction	10-84
G. Assay and Identification of Viruses in		B. Data Acquisition	10-85
Sample Concentrates	9-197		

C. Sample Preservation	10-94	B. Key to Major Groups of Aquatic Organisms (Plates 1–35)	10-122
D. Analysis of Collections	10-95	Acknowledgments	10-126
E. Investigation of Fish Kills	10-100	C. Key for Identification of Freshwater Algae Common in Water Supplies and Polluted Waters (Plates 1A, 1B, 28–35)	10-160
10700 BENTHIC MEIOFAUNA	10-101	D. Index to Illustrations	10-165
10750 NEMATOLOGICAL EXAMINATION.	10-102	E. Selected Taxonomic References	10-168
A. Introduction	10-102		
B. Collection and Processing Techniques for Nematodes	10-104		
C. Illustrated Key to Freshwater Nematodes	10-106		
10900 IDENTIFICATION OF AQUATIC ORGANISMS	10-122		
A. Procedure in Identification	10-122		

INDEX

I-1

FIGURES

1010:1	Three types of frequency distribution curves—normal Gaussian (A), positively skewed (B), and negatively skewed (C)—and their measures of central tendency: mean, median, and mode	1-2	2720:1	Gas collection apparatus	2-95
1020:1	Control charts for means	1-12	2810:1	Time response for the membrane- diffusion method	2-101
1020:2	Duplicate analyses of a standard	1-13	3112:1	Schematic arrangement of equipment for measuring mercury by cold-vapor atomic absorption technique	3-24
1020:3	Range chart for variable concentrations	1-13	3114:1	Manual reaction cell for producing As and Se hydrides	3-35
1020:4	Range chart for variable ranges	1-13	3114:2	Schematic of a continuous hydride generator	3-39
1020:5	Means control chart with out-of-control data (upper half)	1-14	3500-AI:1	Correction curves for estimation of aluminum in the presence of fluoride	3-62
1030:1	Detection level relationship	1-20	3500-As:1	Arsine generator and absorber assembly	3-65
1060:1	Approximate number of samples required in estimating a mean concentration.	1-42	3500-Se:1	General scheme for speciation of selenium in water	3-90
2120:1	Chromaticity diagrams	2-10	3500-Sr:1	Graphical method of computing strontium concentration	3-100
2150:1	Odor-free-water generator	2-17	4110:1	Typical inorganic anion separation	4-6
2170:1	Taste and odor wheel, showing flavor and odor attributes and example compounds	2-25	4110:2	Typical inorganic anion separation	4-8
2530:1	Floatables sampler with mixer	2-59	4110:3	Typical separation in a simulated drinking water sample.	4-10
2530:2	Floatables flotation funnel and filter holder	2-60	4120:1	Schematic of a segmented flow analyzer	4-13
2530:3	Flotation funnels and mixing unit	2-60	4140:1	Electropherogram of the inorganic anions and typically found organic acids using capillary ion electrophoresis and chromate electrolyte	4-17
2530:4	Floatable oil tube, 1-L capacity	2-62	4140:2	Electropherogram of 0.1 mg/L inorganic anions at minimum detection level	4-18
2560:1	Schematic of filtration apparatus for preparing particle-free dilution water or electrolyte solution	2-72	4140:3	Representative electropherograms of Youden anion standards.	4-19
2710:1	Schematic diagram of settling vessel for settled sludge volume test	2-89	4140:4	Linearity calibration curve for chloride, bromide, and sulfate.	4-20
2710:2	Schematic diagram of settling vessel for zone settling rate test	2-91	4140:5	Linearity calibration curve for fluoride and <i>o</i> -phosphate	4-20
2710:3	Capillary suction time apparatus	2-92	4140:6	Linearity calibration curve for nitrite and nitrate.	4-20
2710:4	TTF equipment.	2-93			
2710:5	Schematic diagram of settling column and stirring rods for modified sludge volume test.	2-94			