Methods List for Automated Ion Analyzers

Flow Injection Analysis • Ion Chromatography

XX XXX 20XX

QuikChem® Methods List

Use this list to:

- Identify and select analytical methods for your analyte, range, and matrix requirements.
- Locate all current Lachat methods for ion chromatography and flow injection analysis.
- Find methods accepted for USEPA compliance monitoring. These methods have symbols after the method number depending on whether the method is Accepted or Equivalent for NPDES and/or NPDWR reporting. Additional regulatory information can be found in the Regulatory Quick Reference section.
- Find methods with ERA or other external QC included in the support data. These methods have a * after the method number.

Performance Data Specifications

•**Range**: The range quoted in the Lachat methods list is based on the **actual, calibrated range.** The calibrated range is the lowest calibration standard to the highest calibration standard. (A blank is typically included in the calibration but is not included in the method range)

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•**MDL**: The MDL (method detection limit) is calculated by the following protocols:
The Student's T number for the number of replicates is multiplied by the standard deviation calculated from those replications.

If **7 replicates** are used: The Student's T value is 3.14.

If **21 replicates** are used: The Student's T value is 2.528.

Example for 21 replicates: 2.528 X 0.123 = 0.39 for an MDL

•**Quantitation Limit**: Quantitation limit is typically 3 to 5 times the calculated MDL or 10X the standard deviation of the MDL standard used. Typically, this is the lowest calibration standard in a given method.

•**Precision**: Stated in the methods as %RSD. %RSD is calculated as follows: %RSD = (SD /Mean) x 100

Part Numbers Versus Method Numbers

To convert Method Numbers to part numbers, place an **E** in front of the Method Number.

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•Methods, other than those listed as EPA Accepted/equivalent, were developed to meet individual customer requirements. In order to ensure that Lachat methods exactly meet the requirements of your application, please contact your local Sales Representative or Distributor

•When you have purchased a manifold, a copy of the method will be sent with a manifold diagram. Copies of methods without manifold diagrams are available to Lachat customers upon request.

Lachat QuikChem® Method Number Key

XX	-	XXX	-	XX	-	X	-	X
matrix		analyte		form		chemistry		concentration

Matrix:

10	Waters, wastewaters	12	Soil extracts
13	Plant or soil digests	14	Fertilizer digests
15	Feeds & forages	18	Aqueous formulations
19	Plating baths / mineral processing	20	Food stuffs
21	Beverages	23	Bioreactor solutions
25	Chlor-Alkali (Caustic, brine)	26	Tobacco extracts
70	High Purity Waters	90	Multi-matrix method

Analyte:

The first three numbers indicate the predominant chemical moiety.

Class (Ion Chromatography)

510	Anions	511	Rapid IC Anions
520	Cations	540	Oxyhalides

Element

105	Boron	107	Nitrogen
109	Fluorine	111	Sodium
112	Magnesium	113	Aluminum
114	Silicate	115	Phosphorus
116	Sulfur	117	Chlorine
119	Potassium	120	Calcium
123	Molybdenum	124	Chromium (Hexavalent)
125	Uranium	126	Iron
129	Copper	131	Manganese
135	Bromine	136	Iodine
140	Carbon		

Molecules

201	Reducing sugars (Total)	203	Glucose
204	Cyanide	206	Urea
210	Phenol	218	Total amino acids
221	Formaldehyde	224	Chlorate
225	Hydroxide	226	Hypochlorite
241	Sulfur dioxide	244	Amylose
245	Monochloramine	246	Reducing Substances

Parameters

301	Hardness (Total)	302	Conductivity
303	Alkalinity	304	pH
305	Acidity	306	Surfactants
308	Color		

Form:

The method either determines this form of the analyte or converts the analyte to this form for determination.

00	Form given by previous three numbers	01	Phosphate (PO_4^{3-})
02	Calcium (Ca^{2+})	03	Potassium (K^+)
04	Nitrate (NO_3^-)	05	Nitrite (NO_2^-)
06	Ammonium (NH_4^+), Ammonia (NH_3)	07	Chloride (Cl^-)
08	Boric Acid (H_3BO_3)	09	Iodide (I^-)
10	Sulfate (SO_4^{2-})	11	Sulfite (SO_3^{2-})
12	Fluoride (F^-)	13	Chromium (VI) (Cr)
18	Total Iron (Fe^{2+} + Fe^{3+})	19	Iron (II) (Fe^{2+})
21	Bromide (Br^-)	23	Molybdenum (VI) (Mo)
24	Hydronium (H_3O^+, H^+)	25	Hydroxide (OH^-)
26	Magnesium (Mg^{2+})	27	Silicate (SiO_2)
29	Sulfide (S^{2-})	31	Calcium carbonate ($CaCO_3$)
32	Sodium cation (Na^+)	33	Aluminum (inorganic) (Al)
34	Aluminum (organic) (Al)	35	Chlorate (ClO_3^-)
36	Hypochlorite (OCl^-)	40	Perchlorate
42	Sulfur dioxide		

Chemistry:

Some analytes have more than one chemistry.

Example:		
Ammonia	**10-107-06-**1	phenolate, phenate
	10-107-06-2	salicylate
	10-107-06-5	gas diffusion

Concentration:

Each range of concentrations for an analyte is given by a single letter. See the methods list for the ranges. Some methods cover more than one range.

Heaters:

Standard heater: Standard heaters have a 175 cm section of 0.032" i.d. (0.8mm) and a 650 cm section of 0.032" i.d. tubing

Non-standard heater: Has a different type and/or length of tubing than that listed above. (Controller and heater block are the same; only the tubing is different).

Regulatory Quick Reference

The QuikChem® methods in the list that follows are considered permitted reporting options for the National Pollutant Discharge Elimination (NPDES) and/or the National Primary Drinking Water Regulations (NPDWR) programs of the US Environmental Protection Agency (USEPA). Also listed are those QuikChem® methods that follow ISO standards.

The most recent MUR (Method Update Rule) was signed by the Administrator on April 17, 2012 and published at the CFR on May 18, 2012.

Standard Methods (Which are Lachat Methods) added to Table 1B:

Analyte	Lachat #*	SM #
Ammonia	10-107-06-1-J	4500-NH_3-H
Organic Nitrogen (Kjeldahl Nitrogen)	10-107-06-2-D 10-107-06-2-E	4500 N_{ORG} D-1997
Orthophosphorus	10-115-01-1-A	4500 P G 1999
Total phosphorus (manual digest)	10-115-01-1-E	4500 P H 1999
Silica	10-114-27-1-A	4500 SiO_2 F-1997
Sulfate	10-116-10-2-A	4500 SO_4 G-1997

(Please note that these methods, except for MTB sulfate, already had acceptable version letters for NPDES Reporting).

Although information regarding approved and accepted methods is published in the CFR, states still have primacy. As a result, it is important that labs discuss their plans to use **any** method (including promulgated, accepted, equivalent/modified methods) with their auditor **prior** to the method's implementation, to be sure the proposed change or modified method will be accepted. By doing so, the lab will also know in advance what validation will be required in their specific case for implementation.

Designation in the methods list means the method is EPA accepted as equivalent for NPDWR, NPDES, or both (Check the table above)

^ Designation in the methods list means the method is equivalent for NPDES reporting under the MUR

[R] Designation means the manifold is compliant with RoHS-2. (Verify with your sales person that the method can be sold into the EU

Method Number	USEPA NPDES	USEPA NPDWR	USEPA Method	ISO
Alkalinity				
10-303-31-1-A	Accepted			
10-303-31-1-D	Equivalent		310.2	
Chloride				
10-117-07-1-A	Accepted	Accepted		15682
10-117-07-1-B	Accepted	Accepted		15682
10-117-07-1-C	Equivalent		USGS I2 187-85	
10-117-07-1-H	Accepted			
10-117-07-1-K	Equivalent		USGS I2 187-85	
Chromium				
10-124-13-1-A	Accepted			
10-124-13-1-B	Equivalent		SM (20th) 3500 Cr-B USGS I-2030-85 ASTM D1687-92, 02	
Conductivity				
10-302-00-1-A	Accepted			
10-302-00-1-B	Accepted			
Cyanide				
10-204-00-1-A	Accepted	Accepted		
10-204-00-1-X	Approved	Approved	Promulgated method	
10-204-00-1-X2	Equivalent	Accepted	10-204-00-1-X	
Fluoride				
10-109-12-2-A	Accepted	Accepted		
Hardness				
10-301-31-1-A	Accepted			
Nitrogen – Ammonia				
10-107-06-1-B	Accepted			
10-107-06-1-C	Accepted			
10-107-06-1-F	Equivalent		350.1	
10-107-06-1-G	Equivalent		350.1	
10-107-06-1-I	Accepted	Accepted		
10-107-06-1-J	Accepted	Accepted		
10-107-06-1-K	Accepted			
10-107-06-1-M	Equivalent		350.1	
10-107-06-1-X[1]	Equivalent		350.1	
10-107-06-2-A[2]	Equivalent		350.1	
10-107-06-2-L[2]	Equivalent		350.1	
10-107-06-2-O[2]	Equivalent		350.1	
10-107-06-2-X	Equivalent		350.1	
10-107-06-3-F	Equivalent		350.1	
10-107-06-5-B				11732
10-107-06-5-J[1,2]	Equivalent		350.1	
10-107-06-6-A[1,2]	Equivalent		350.1	

10-107-06-6-B[1]	Equivalent		350.1	
30-107-06-1-A	Accepted			
31-107-06-1-B	Equivalent		350.1	
31-107-06-1-F	Equivalent		350.1	
31-107-06-1-G	Equivalent		350.1	
31-107-06-1-H	Equivalent		350.1	

Nitrogen – Kjeldahl (TKN)				
10-107-06-2-D	Accepted			
10-107-06-2-E	Accepted			
10-107-06-2-H	Equivalent		351.2	
10-107-06-2-I	Equivalent		351.2	
10-107-06-2-K	Equivalent		351.2	
10-107-06-2-M	Equivalent		351.2	
10-107-06-2-N	Equivalent		351.2	
10-107-06-2-P	Equivalent		351.2	
10-107-06-2-Q	Equivalent		351.2	
10-107-06-5-F	Equivalent		PAI DK03	11732
10-107-06-6-D[1]	Equivalent		351.2	

Nitrogen – Nitrate + Nitrite				
10-107-04-1-A	Accepted	Accepted		
10-107-04-1-B	Accepted	Accepted		
10-107-04-1-C	Accepted	Accepted		
10-107-04-1-F	Equivalent		353.2	
10-107-04-1-H	Equivalent		353.2	
10-107-04-1-J	Accepted	Accepted		
10-107-04-1-K	Accepted	Accepted		
10-107-04-1-L	Accepted	Accepted		
10-107-04-1-O	Accepted	Accepted		
10-107-04-1-Q	Equivalent		353.2	
10-107-04-1-R	Equivalent	Accepted	353.2	
10-107-04-2-A	Accepted	Accepted		
30-107-04-1-A	Accepted			
30-107-04-1-C	Equivalent		353.2	
31-107-04-1-A	Equivalent		353.4	
31-107-04-1-C	Equivalent		353.4	
31-107-04-1-D	Equivalent		353.4	
31-107-04-1-E	Equivalent		353.4	
31-107-04-1-F	Equivalent		353.4	
31-107-04-1-G	Equivalent		353.4	
31-107-04-1-H	Equivalent		353.4	

Method Number	USEPA NPDES	USEPA NPDWR	USEPA Method	ISO
Nitrogen – Nitrite				
10-107-05-1-A	Equivalent	Accepted	353.2	
10-107-05-1-B	Equivalent		353.2	
10-107-05-1-C	Equivalent		353.2	
31-107-05-1-A	Equivalent		353.4	
31-107-05-1-B	Equivalent		353.4	
Phenol				
10-210-00-1-A	Accepted			
10-210-00-1-B	Accepted			
10-210-00-1-F	Equivalent		420.4	
10-210-00-1-X[1]	Equivalent		420.4	
10-210-00-3-C[1]	Equivalent		420.4	
Phosphate, Ortho				
10-115-01-1-A	Accepted	Accepted		
10-115-01-1-B	Accepted	Accepted		
10-115-01-1-M	Accepted	Accepted		
10-115-01-1-O	Equivalent		365.1	
10-115-01-1-P	Accepted	Accepted		
10-115-01-1-Q	Accepted	Accepted		
10-115-01-1-V	Equivalent	Accepted	365.1	
10-115-01-1-W	Equivalent		365.1	
10-115-01-1-Y	Equivalent		365.1	
31-115-01-1-G	Equivalent		365.5	
31-115-01-1-H	Equivalent		365.5	
31-115-01-1-I	Equivalent		365.5	
31-115-01-1-J	Equivalent		365.5	
31-115-01-1-W	Equivalent		365.5	
31-115-01-1-Y	Equivalent		365.5	
80-115-01-1-A	Equivalent	Accepted	365.1	
Phosphate, Total				
10-115-01-1-E	Accepted			
10-115-01-1-F	Accepted			
10-115-01-4-I	Equivalent		365.3	
Phosphate, Total Kjeldahl (TKP)				
10-115-01-1-C	Accepted			
10-115-01-1-D	Accepted			
10-115-01-1-I	Equivalent		365.4	
10-115-01-2-B	Equivalent		365.4	
10-115-01-2-C	Equivalent		365.4	

Method Number	USEPA NPDES	USEPA NPDWR	USEPA Method	ISO
Silicate				
10-114-27-1-A	Accepted			
10-114-27-1-B	Equivalent		SM(20th)4500-SiO2C USGS I-2700-85 ASTM D859-94, 00	
10-114-27-1-C	Equivalent		SM(20th)4500-SiO2C USGS I-2700-85 ASTM D859-94, 00	
31-114-27-1-A	Equivalent		366.0	
31-114-27-1-B	Equivalent		366.0	
31-114-27-1-D	Equivalent		366.0	
31-114-27-1-E	Equivalent		366.0	
31-114-27-1-F	Equivalent		366.0	
Sulfate				
10-116-01-3-A	Equivalent		ASTM D516-02	
10-116-10-2-A	Equivalent		375.2	
10-116-10-2-B	Equivalent		375.2	
10-116-10-2-E	Equivalent		375.2	
10-116-10-2-F	Equivalent		375.2	
Sulfide				
10-116-29-1-A	Equivalent		SM(20th) 4500-S-D	
10-116-29-1-B	Equivalent		SM(20th) 4500-S-D	
Anionic Surfactants (MBAS)				
10-306-00-1-D	Equivalent		SM(20th) 5540-C	
10-306-00-1-F	Equivalent		ASTM 2330-02/SM5440 C.	
Anions (Ion Chromatography)				
10-510-00-1-A	Equivalent	Accepted	300.0	
10-510-00-1-E	Equivalent	Accepted	300.0	
10-511-00-1-A	Equivalent	Accepted	300.0	
10-540-00-1-C		Accepted		

[1] EPA has revised the language at (b)(4)(T) be **more specific with respect to the use of gas diffusion across a hydrophobic semi-permeable membrane,** to separate the analyte of interest from the sample matrix in place of manual or automated distillation for the analysis of certain analytes. This is an acceptable change to an approved method for the following analytes: ammonia, cyanide, TKN, and Total Phenolics.

[2]Betholot-based method, uses salicylate. See Table 1B at 40 CFR 136

Comparison tables are available for all methods that are equivalent to NPDES methods

In the list of methods that follows:

Designation in the methods list means the method is EPA accepted as equivalent for NPDWR, NPDES, or both (Check the table above)
^ Designation in the methods list means the method is equivalent for NPDES reporting under the MUR

[R] **Designation means the manifold is compliant with RoHS-2**. (Please verify with your sales person that the method can be sold into the EU).

Ion Chromatography Methods

Method No	Range	MDL	Matrix, Units	Comments	Rev Date
Anions					
10-510-00-1-A #			**Waters**	**USEPA method 300.0 (A); multi-range method (multiple ranges possible with different sample loops)**	**29-Nov-01**
10-510-00-1-A1					
Bromide	0.05 – 5.0	0.018	mg Br^-/L		
Chloride	0.5 – 50.0	0.004	mg Cl^-/L		
Fluoride	0.05 – 5.0	0.004	mg F^-/L		
Nitrate	0.05 – 5.0	0.004	mg NO_3^- - N/L		
Nitrite	0.05 – 5.0	0.008	mg NO_2^- - N/L		
Phosphorus	0.05 – 5.0	0.012	mg HPO_4^{2-} - P/L	Orthophosphate	
Sulfate	1.0 – 100	0.012	mg SO_4^{2-}/L		
10-510-00-1-A2					
Bromide	0.1 – 5		mg Br^-/L		
Chloride	2 – 100		mg Cl^-/L		
Fluoride	0.2 – 10		mg F^-/L		
Nitrate	0.2 – 10		mg NO_3^- - N/L		
Nitrite	0.1 – 5		mg NO_2^- - N/L		
Phosphorus	0.2 – 10		mg HPO_4^{2-} - P/L	Orthophosphate	
Sulfate	4 – 200		mg SO_4^{2-}/L		
10-510-00-1-A3					
Bromide	0.025 – 2.5	0.005	mg Br^-/L		
Chloride	0.25 – 25	0.012	mg Cl^-/L		
Fluoride	0.025 – 2.5	0.004	mg F^-/L		
Nitrate	0.025 – 2.5	0.002	mg NO_3^- - N/L		
Nitrite	0.025 – 2.5	0.005	mg NO_2^- - N/L		
Phosphorus	0.025 – 2.5	0.003	mg HPO_4^{2-} - P/L	Orthophosphate	
Sulfate	0.5 – 50	0.003	mg SO_4^{2-}/L		
10-510-00-1-A4					
Bromide	0.16 – 3.0	0.02	mg Br^-/L		
Chloride	32 – 600		mg Cl^-/L		
Fluoride	0.04 – 0.75	0.008	mg F^-/L		
Nitrate	0.04 – 0.75	0.005	mg NO_3^- - N/L		
Nitrite	0.04 – 0.75	0.02	mg NO_2^- - N/L		
Phosphorus	0.10 – 1.875	0.02	mg HPO_4^{2-} - P/L	Orthophosphate	
Sulfate	32 – 600		mg SO_4^{2-}/L		

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-510-00-1-C				**Waters**	**Common Inorganic Anions**	**8-Sep-03**
Bromide	0.06 – 6.0	0.02	mg Br^-/L			
Chloride	0.6 – 60	0.005	mg Cl^-/L			
Fluoride	0.04 – 4.0	0.006	mg F^-/L			
Nitrate	0.06 – 6.0	0.007	mg NO_3^- - N/L			
Nitrite	0.016 – 1.6	0.002	mg NO_2^- - N/L			
Phosphorus	0.06 – 6.0	0.015	mg HPO_4^{2-} - P/L		Orthophosphate	
Sulfate	2.0 – 200	0.03	mg SO_4^{2-}/L			
10-510-00-1-E ^#				**Waters**	**Rapid anions method; Omnion 3.0 or higher; multi-range method (multiple ranges possible with different sample loops)**	**29-Oct-08**
10-510-00-1-E1						
Bromide	0.05 – 5.0	0.016	mg Br^-/L			
Chloride	0.5 – 50	0.029	mg Cl^-/L			
Fluoride	0.05 – 5.0	0.004	mg F^-/L			
Nitrate	0.05 – 5.0	0.008	mg NO_3^- - N/L			
Nitrite	0.05 – 5.0	0.033	mg NO_2^- - N/L			
Phosphorus	0.05 – 5.0	0.015	mg HPO_4^{2-} - P/L		Orthophosphate	
Sulfate	1.0 – 100	0.02	mg SO_4^{2-}/L			
10-510-00-1-E2						
Bromide	0.025 – 2.5	0.015	mg Br^-/L			
Chloride	0.015 – 2.5	0.006	mg Cl^-/L			
Fluoride	0.025 – 2.5	0.003	mg F^-/L			
Nitrate	0.025 – 2.5	0.0048	mg NO_3^- - N/L			
Nitrite	0.025 – 2.5	0.0048	mg NO_2^- - N/L			
Phosphorus	0.025 – 2.5	0.0098	mg HPO_4^{2-} - P/L		Orthophosphate	
Sulfate	0.5 – 50	0.02	mg SO_4^{2-}/L			
10-510-00-1-E3						
Bromide	0.1 – 5	0.038	mg Br^-/L			
Chloride	2 – 100	0.016	mg Cl^-/L			
Fluoride	0.2 – 10	0.016	mg F^-/L			
Nitrate	0.2 – 10	0.029	mg NO_3^- - N/L			
Nitrite	0.1 – 5.0	0.01	mg NO_2^- - N/L			
Phosphorus	0.2 – 10	0.034	mg HPO_4^{2-} - P/L		Orthophosphate	
Sulfate	4 – 200	0.144	mg SO_4^{2-}/L			

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-511-00-1-A #				**Waters**	**Rapid anions method; multi-range method (multiple ranges possible with different sample loops). Omnion 3.0 or higher.**	**16-Sep-03**
10-511-00-1-A1						
Chloride	1.0 – 100	0.004	mg Cl^-/L			
Nitrate	0.2 – 20.0	0.003	mg NO_3^- - N/L			
Phosphorus	0.05 – 5.0	0.006	mg HPO_4^{2-} - P/L		Orthophosphate	
Sulfate	1.0 – 100	0.014	mg SO_4^{2-}/L			
10-511-00-1-A2						
Chloride	1.5 – 150	0.01	mg Cl^-/L			
Nitrate	0.25 – 25	0.005	mg NO_3^- - N/L			
Phosphorus	0.1 – 10	0.016	mg HPO_4^{2-} - P/L		Orthophosphate	
Sulfate	2.5 – 250	0.04	mg SO_4^{2-}/L			
10-540-00-1-C #				**Waters**	USEPA method 300.1; determination of disinfection byproducts; **Omnion 3.0 or higher**	**24-Nov-08**
Bromate	5 – 50	1.15	µg BrO_3^-/L			
Bromide	10 – 100	2.01	µg Br^-/L			
Chlorate	20 – 200	5.00	µg ClO_3^-/L			
Chlorite	5 – 50	2.61	µg ClO_2^-/L			
70-510-00-1-C				**High Purity Waters**	**Omnion 3.0 or higher**	**17-Dec-08**
Bromide	2.0 – 40.0	0.67	µg Br^-/L			
Chloride	1.0 – 20.0	0.22	µg Cl^-/L			
Fluoride	1.0 – 20.0	0.39	µg F^-/L			
Nitrate	1.0 – 20.0	0.20	µg NO_3^- - N/L			
Nitrite	1.0 – 20.0	0.40	µg NO_2^- - N/L			
Phosphorus	3.0 – 60.0	0.60	µg HPO_4^{2-} - P/L		Orthophosphate	
Sulfate	1.5 – 30.0	0.45	µg SO_4^{2-}/L			

Cations

70-520-00-1-C				**High Purity Waters**	**Omnion 3.0 or higher; High Purity Waters**	**23-May-17**
Ammonium	0.5-50	0.10	µg Na^+/L		**Run time 8 minutes, for sodium and ammonium ONLY**. Run time requires extension for analysis of additional Cations. Customer must purchase columns from Shodex.	
Sodium	0.5-50	0.14	µg NH_4^+/L			

Flow Injection Analysis Methods

Acidity

10-305-31-1-A^{R}	30 – 500	4.0	mg $CaCO_3$/L	Waters	Thymol blue method. 600 nm	3-Sep-03

Alkalinity

10-303-31-1-A^{R}#	10 – 500	2.3	mg $CaCO_3$/L	Waters	Methyl orange method; Total Alkalinity. 550 nm, NPDES Accepted.	23-Jan-01
10-303-31-1-D^{R}^	1 – 50	0.27	mg $CaCO_3$/L	Waters	Methyl orange method; Total Alkalinity, 550 nm. NPDES Equivalent (310.2).	3-Sep-03

Aluminum

10-113-33-1-B^{R}	0.1 – 5.0	0.02	mg Al/L	Waters	Total Reactive (monomeric) Al; pyrocatechol violet; determination in 0.15% HNO_3 matrix. 580 nm. **Inert Probe required**	27-Aug-03
10-113-34-1-B	0.01 – 0.3	0.0015	mg Al/L	Waters	Non-exchangeable (organically complexed) Al. pyrocatechol violet; Dilute HNO_3 preservation required. 580 nm. **Inert Probe required**	27-Aug-03
12-113-33-1-B^{R}	1.0 – 30	0.1	mg Al/L	Soil extracts	Total reactive (monomeric) Al; pyrocatechol violet; Determination in 1 M KCl extracts. 580nm **Inert Probe required**	3-Sep-03

Amino Acids

18-218-00-1-A^{R}	1.25 – 40	0.22	mM Leucine	Aqueous formulations	Ninhydrin. Determination in rumen fluid. 580 nm. **Requires a non-standard heater**.	3-Sep-03

Ammonia

See also IC section

10-107-06-1-B #*	0.05 – 5.0	0.007	mg N/L as NH_3	Waters	Alkaline phenol-based method; determination in 0.2% H_2SO_4 preserved samples; 630 nm**. Requires a standard heater**. NPDES Accepted	27-Aug-01
10-107-06-1-C #^{R}	0.01 – 4.0	0.004	mg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm. determination in non-preserved samples; **Requires a standard heater.** NPDES Accepted	2-Nov-01

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-107-06-1-F[R]^	10–100	1.0	µg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm **Requires a standard heater** Preserved samples. NPDES Equivalent (350.1)	
10-107-06-1-G [R]^	10 – 500	1.53	µg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm. Preserved samples. Ultra High Throughput method (>100 samples/hr); **Requires a standard heater.** NPDES Equivalent (350.1)	14-Dec-07
10-107-06-1-I [R]^	0.1 – 30.0	0.01	mg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm. Non-preserved samples. Preserved samples require pH adjustment prior to analysis. **Requires a standard heater** NPDES Equivalent	28 Aug 15
10-107-06-1-J #	0.01 – 2.0	0.002	mg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm. Low-flow method; determination in preserved and non-preserved samples; **Requires a standard heater** NPDES/NPDWR Accepted	29-Nov-07
10-107-06-1-K[R]#	0.2 – 20.0	0.01	mg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm. **Requires a standard heater**. Low-flow method; NPDES Accepted	15-Mar-01
10-107-06-1-L	0.01 – 2.0	0.0028	mg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm. Use w/ 10-245-00-1-A for monochloramine Non-preserved samples. **Requires a standard heater**	6-Nov-07
10-107-06-1-M^	0.01 – 2.0 0.2 – 20.0	0.002 0.011	mg N/L as NH_3	Waters	Alkaline phenol-based method; determination in acid preserved or non-acid preserved samples; multi-range method; 630 nm. **Requires a standard heater** NPDES Equivalent (350.1)	9-Nov-07
10-107-06-1-O [R]^	2.0 – 500 0.25 – 10	0.56	µg N/L as NH_3 mg N/L as NH_3	Waters	Alkaline phenol-based method; multi-range method; 630 nm. Preserved samples. **Requires a standard heater** NPDES Equivalent (350.1)	22-Feb-08
10-107-06-1-Q^	0.005- 2.0 0.25-20.0	0.0022 0.0038	mg N/L as NH_3	Waters	Alkaline phenol-based method, citrate buffer; multi-range method; 630 nm. Non-preserved samples. **Requires a standard heater** NPDES Equivalent (349.0)	17-Aug-10
10-107-06-1-X [R]^	0.05 – 20.0	0.007	mg N/L as NH_3	Waters	**MicroDist method**; **requires MicroDist block and tubes**. Preserved or un-preserved samples. Alkaline phenol determination. 630 nm. **Requires a standard heater** NPDES Equivalent (350.1)	17-Sep-09

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-107-06-2-A^{R} ^	0.10 – 5.0 1.0-20	0.005 0.10	mg N/L as NH_3	Waters	Sodium salicylate-based method; 660 nm. **Requires a standard heater** NPDES Equivalent (350.1)	15-Sept-15
10-107-06-2-L^{R} * ^	0.05 – 20	0.01	mg N/L as NH_3	Waters	Sodium salicylate-based method; 660 nm Ultra High Throughput method (>120 samples/hr); **Requires a standard heater** NPDES Equivalent (350.1)	16-Aug-07
10-107-06-2-O^{R} ^	10 – 500	1.1	µg N/L as NH_3	Waters	Sodium salicylate-based method; 660 nm. **Requires a standard heater** multi-range method; NPDES Equivalent (350.1)	7-Dec-07
10-107-06-2-R^{R}	0.25 – 30 0.02-5.0	0.011 0.004	mg N as NH_3 mg N as NH_3	Waters	10 mM H_3PO_4 preservation. Sodium salicylate-based method; 660 nm. **Requires a standard heater**	18-Dec-09
10-107-06-2-X^{R}^	0.05-20	0.033	mg N/L as NH_3	Waters	Sodium Salicylate method for MicroDist distillates. **Requires a standard heater**. Preserved or un-preserved samples. 660 nm. Requires MicroDist block and tubes. NPDES Equivalent (350.1)	17-Aug -15
10-107-06-3-B^{R}	0.05 – 1.0	0.008	mg N/L as NH_3	Waters	Sodium salicylate-based method; Uses DClC instead of NaOCl 660 nm. **Requires a standard heater.**	26-Aug-03
10-107-06-3-D^{R}	0.005 – 0.25	0.001	mg N/L as NH_3	Waters	Sodium salicylate-based method; uses DClC instead of NaOCl 660 nm. **Requires a standard heater**	26-Aug-03
10-107-06-3-F ^{R}^	1.25 – 100	0.41	µg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm. **Requires a non-standard heater** uses DClC; **2-cm detector** method; for **QC8500 only**; NPDES Equivalent (350.1)	17-Feb-09
10-107-06-5-B^{R}	0.10 – 1.0 1.0-10.0	0.01	mg N/L as NH_3	Waters	Gas diffusion method; low-flow method; ISO (11732) 590nm	19-Mar-04
10-107-06-5-J^{R}^	0.01-1.0 0.1-20	0.002 0.02	mg N/Las NH_3	Waters	Gas Diffusion method. Salicylate/DCIC. May be used for TKN as well as brackish/saline samples. 660 nm. **Requires a standard heater**.	16-Jan-15
10-107-06-6-A^{R} ^	0.25 – 20	0.13	mg N/L as NH_3	Waters	Sodium salicylate-based method; 660 nm. inline distillation method; **Requires a standard heater and in-line module for distillation step.** Samples w/ particulates not suitable. NPDES Equivalent (350.1).	24-Jul-08

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-107-06-6-B R^	0.25 – 10	0.066	mg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm. inline distillation method; low-flow method; **Requires a standard heater and an in-line module for the distillation.** Samples w/ particulates not suitable. NPDES Equivalent (350.1);	29-Jul-08
10-107-06-6-E R^	10-250	5 (pres.) 1 (un-pres.)	µg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm inline distillation method; **Requires a standard heater and an in-line module for the distillation.** Low-flow method; samples w/ particulates not suitable NPDES Equivalent (350.1);	15-Apr-11
12-107-06-1-A R	0.01 – 1.0	0.002	mg N/L as NH_3	Soil extracts	Alkaline phenol-based method; Determination in **2M KCl** soil extracts 630 nm. **Requires a standard heater.**	17-Sep-08
12-107-06-1-B R	1.0 – 20.0	0.035	mg N/L as NH_3	Soil extracts	Alkaline phenol-based method; Determination in **2M KCl** soil extracts 630 nm. **Requires a standard heater.**	15-Sep-08
12-107-06-2-A R	0.10 – 20.0	0.035	mg N/L as NH_3	Soil extracts	Sodium salicylate-based method; Determination in **2M KCl** soil extracts 660 nm. **Requires a standard heater.**	3-Sep-03
12-107-06-2-F R	0.1 – 20	0.026	mg N/L as NH_3	Soil extracts	Sodium salicylate-based method; Determination in **2M KCl** soil extracts; Ultra High Throughput method (>120 samples/hr) 660 nm. **Requires a standard heater.**	15-Aug-07
12-107-06-2-H R	1-100	0.06	mg N/L as NH_3	Air monitoring (above soil) extracts	Sodium Salicylate. **0.029M glycerol/0.18M H_3PO_4 matrix.** 660 nm. **Requires a standard heater.**	18-Mar-13
12-107-06-2-I R	0.1-5	0.02	mg N/L as NH_3	Air monitoring (above soil) extracts	Sodium Salicylate. **4% glycerol/1M H_2SO_4 matrix.** 660 nm. **Requires a standard heater.**	18-Aug-17
12-107-06-3-A R	2.0 – 40.0	0.11	mg N/L as NH_3	Soil extracts	Sodium salicylate-based method; Determination in **0.0125M $CaCl_2$** soil extracts 660 nm. **Requires a standard heater.**	3-Sep-03
12-107-06-3-B R	0.2 – 4.0	0.01	mg N/L as NH_3	Soil extracts	Sodium salicylate-based method; **2M KCl** soil extracts. 660 nm. **Requires a standard heater.**	3-Sep-03

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
12-107-06-3-C^{R}	0.2 – 4.0	0.03	mg N/L as NH_3	Soil extracts	Sodium salicylate-based method; Determination in **0.0125M $CaCl_2$** soil extracts 660 nm. **Requires a standard heater.**	3-Sep-03
12-107-06-3-D^{R}	1.0-75	0.2	mg N/L as NH_3	Soil extracts	Sodium salicylate-based method; Determination in **1M KCl or water extracts** of soils 660 nm. **Requires a standard heater.**	14-Apr-14
12-107-06-5-A^{R}	0.1 – 20.0	0.02	mg N/L as NH_3	Soil extracts	Gas diffusion method; **2M KCl** soil extracts 590 nm.	23-Feb-10
14-107-06-1-B^{R}	5.0 – 180	0.5	mg N/L as NH_3	Fertilizers	Alkaline phenol-based method. HCl digest of solid fertilizers. 630 nm. **Requires a standard heater and inert probe.**	3-Sep-03
14-107-06-1-C	60 – 600	1.33	mg N/L as NH_4	Fertilizers	Salicylate/DCIC based method. 660 nm. **Requires a standard heater.**	21-Aug-03
18-107-06-1-A^{R}	1.75 – 140	0.08	mg N/L as NH_3	Aqueous formulations	Alkaline phenol-based method; 0.10M HCl and Rumen fluid. 630 nm. **Requires a standard heater.**	10-Aug-09
26-107-06-4-A	10 – 50.0	0.151	mg N/L as NH_3	Tobacco extracts	Sodium salicylate/DCIC method; **0.005M H_2SO_4** matrix. 660 nm; dialysis method; **Requires a standard heater**.	3-Sep-03
31-107-06-1-B^{R}^	5 – 600 **0.36-42.86**	0.7	µg N/L as NH_3 **µM N/L as NH_3**	Brackish / Seawaters	Alkaline phenol-based method; Can be used for determination of samples w/ 0 to 35 ppt salinity; 630 nm. **Requires a standard heater.** NPDES Equivalent (350.1)	18-Sep-08
31-107-06-1-F^	0.005 – 2.0 **0.36-142.86**	0.002	mg N/L as NH_3 **µM N/L as NH_3**	Brackish / Seawaters	Alkaline phenol-based method; 630 nm. Can be used for determination of samples w/ 0 to 35 ppt salinity; **Requires a standard heater.** NPDES Equivalent (350.1)	12-Nov-07
31-107-06-1-G^{R}^	1.25 – 100 **0.089-7.143**	0.41	µg N/L as NH_3 **µM N/L as NH_3**	Brackish / Seawaters	Alkaline phenol-based method; DCIC. 630 nm **2-cm detector method; QC8500 only;** Can used for determination of samples w/ 0 to 35 ppt salinity; **Requires a non-standard heater**. NPDES Equivalent (350.1)	26-Jan-10
31-107-06-1-H^{R}^	0.25 – 30.0 **0.018-2.143**	0.025	mg N/L as NH_3 **mM N/L as NH_3**	Brackish / Seawaters	Alkaline phenol-based method; 630 nm. high range method; Can used for determination of samples w/ 0 to 35 ppt salinity; Ultra-High Throughput method (>120 samples/hr) **Requires a standard heater.**	31-Oct-08

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
31-107-06-1-I	5-500 **0.3571-35.71**	0.47	µg N/L as NH_3 **µM N/L as NH_3**	Brackish / Seawaters	Alkaline phenol-based method, citrate/tartrate buffer. 630 nm, **Requires a standard heater.**	21-Feb-12
31-107-06-1-Q^	0.005-2.0 **0.36-142.86**	0.0022	mg N/L as NH_3 **µM N/L as NH_3**	Brackish / Seawaters	Alkaline phenol-based method, citrate buffer. 630 nm, **Requires a standard heater.** NPDES Equivalent to 349.0	17-Aug-10
90-107-06-3-A^R	0.1-6.0	0.02-	mg N/L as NH_3	Water/Soils	Multiple matrix Method**. Water, 2M KCl, 0.5M K_2SO_4, 0.01 $CaCl_2$**. Salicylate/DCIC**.** Ultra-High Throughput method. 120 samples per hour.660 nm. **Requires a standard heater**	08-Feb-11

Amylose

20-244-00-1-A^R	1 – 500	0.044	mg Amylose/L	Food stuffs	Iodine / acetic acid. 600 nm. Determination in 0.1 N NaOH/ETOH digests of rice; low-flow method.	20-Jul-07

Boron

10-105-08-1-B^R	0.5 – 10.0	0.02	mg B/L	Waters	Azomethine-H method. 430 nm	22-Aug-03

Bromide

See also IC section

10-135-21-2-B^R	0.5 – 10	0.075	mg Br^-/L	Waters	Phenol red method. 590 nm.	3-Sep-03
18-135-21-2-B^R	0.5 – 10	0.05	mg Br^-/L	Aqueous formulations	Phenol Red method. 590 nm. Determination in 0 to 30% w/v NaCl solutions	3-Sep-03
30-135-21-1-B^R	5.0 – 60.0 **0.0625-0.751**	0.22	mg Br^-/L **mM Br^-/L**	Brackish / Seawaters	Phenol Red method. 590 nm. Follows Standard Methods (4500-Br-D) 590 nm.	3-Sep-03

Calcium

See also IC section and Hardness

12-120-02-1-B^R	0.25-50 10-1000	0.05 0.7	mg Ca/L	Soil extracts	1M ammonium acetate extracts. 600 nm. o-cresolphthalein complexone Multi-range method.	16-May-12
14-120-02-1-B^R	5 – 120	0.5	mg Ca/L	Fertilizers	Determination in HCl digests (0.48M in digestate) o-cresolphthalein complexone . 600 nm.	4-Sep-03

	Method No	Range	MDL	Units	Matrix	Comments	Rev Date
Carbon (Total Dissolved)							
12-140-39-5-A[R]	5-400	0.7	mg C/L		Soil Extracts	0.5M K2SO4 extracts. Phenol Red Method. 440 nm. Can measure TN from the same digest with method 12-107-04-3-C. Requires an in-line digestion module (One supplies both channels)	19-Dec-11
Carbonate (Total)							
10-216-00-1-B[R]	1-50	0.02	mM CO2/L		Waters	Cresol red gas diffusion method. 450 nm	15-May-1
Chlorate			***See also IC section***				
25-224-35-1-D[R]	0.1-2.0	0.005	mg $NaClO_3$/L		Chlor-Alkali	Ferrozine. Determination in 50-200g NaOH/L. 500 nm. **Requires a standard heater.**	4-Sep-03
25-224-35-1-G[R]	0.10-2.0	0.005	g $NaClO_3$/L		Chlor-Alkali	50 to 200 g NaCl/L sample matrix (no NaOH in matrix); ferrozine method; 500 nm**.** selective against hypochlorite. **Requires a standard heater.**	4-Sep-03
Chloride			***See also IC section***				
10-117-07-1-A# *	6 – 300	0.15	mg Cl^-/L		Waters	Mercuric thiocyanate, 480 nm. Low-flow method; NPDES/NPDWR Accepted; also follows ISO (15682)	29-Nov-07
10-117-07-1-B #	2.5 – 100	0.5	mg Cl^-/L		Waters	Mercuric thiocyanate, 480 nm. Low-flow method; NPDES/NPDWR Accepted; also follows ISO (15682)	29-Nov-07
10-117-07-1-C^	0.1 – 10.0	0.017	mg Cl^-/L		Waters	Mercuric thiocyanate, 480 nm. Low-flow method; NPDES Equivalent. follows Standard Methods (4500-Cl-G; USGS I2187-85);	28-Aug-03

	Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-117-07-1-H#	2.5 – 100	0.2	mg Cl^-/L		Waters	Mercuric thiocyanate, 480 follows Standard Methods (4500-Cl-G; USGS I2187-85); 480nm. also follows ISO (15682) Low-flow method; NPDES Accepted	5-Apr-01
10-117-07-1-K^R^	1.0 – 150	0.277	mg Cl^-/L		Waters	Mercuric thiocyanate, 480 nm. Ultra High Throughput method (120 samples/hr); NPDES Equivalent; follows Standard Methods (4500-Cl-G); USGS I2187-85); also follows ISO (15682)	27-May-09
12-117-07-1-B^R	0.25-30	0.05	mg Cl^-/L		Soil Extracts	0.01M $Ca(NO_3)_2.4\ H_2O$. Mercuric thiocyanate, 480 nm.	26-Aug-11
12-117-07-1-C^R	5-800	1	mg Cl^-/L		Soil Extracts	2M HNO_3 Mercuric thiocyanate, 480 nm.	05-Jun-12
12-117-07-1-D^R	0.1-30	0.05	mg Cl^-/L		Soil Extracts	0.014M $Ca(SO_4)_2$. Mercuric thiocyanate, 480 nm.	11-Jun-12
12-117-07-1-E^R	0.5-30	0.06	mg Cl^-/L		Soil Extracts	0.5g calcium acetate hydrate. Mercuric thiocyanate. 480 nm. 102 samples per hour.	21-Mar-17
14-117-07-1-A^R	0.5-25	0.1	mg Cl^-/L		Fertilizer	Mercuric thiocyanate. 480 nm. Water extracts of solid fertilizers or liquid fertilizer diluted in water. 102 samples per hour	21-Mar-17
19-117-07-1-B^R	5-40	0.1	mg Cl^-/L		$ZnSO_4$Solutions	Sample dilited 25-fold. Mercuric Thiocyyanate 480nm. Up to 10% Bisulfite.	04-Sept-03
25-117-07-1-F^R	10-250	N/A	g Cl^-/L		Chlor-Alkali	Mercuric thiocyanate, 480 nm. 70-200g naOH Matrix. **Requires 1 mm flow cell**	08-Nov-10
26-117-07-1-A^R	6-300	1.5	mg Cl^-/L		Tobacco Extracts	5% Acetic acid extracts of tobacco. Mercuric thiocyanate, 480 nm	30-Nov-10
Chromium			***See also IC section***				
10-124-13-1-A^R#	5 – 400	0.35	µg Cr/L as Cr(VI)		Waters	Hexavalent chromium; Diphenylcarbazide; 540 nm. Has Omnion 3.0 support added. NPDES Accepted.	9-Oct-00
10-124-13-1-B^R^	2 – 200	0.27	µg Cr/L as Cr(VI)		Waters	Hexavalent chromium; Diphenylcarbazide; 540 nm NPDES Equivalent; follows Standard Methods (3500 Cr-B) Diphenylcarbazide;	4-Apr-04
31-124-13-1-A^R	2– 200 **0.038-3.85**	0.66 **0.0127**	µg Cr/L as Cr(VI) **µM Cr/L as Cr(VI)**		Brackish / Seawaters	Hexavalent chromium in seawater/brackish waters. Diphenylcarbazide; 540 nm.	24-Aug-09

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
Color						
10-308-00-1-B[R]	25 – 250	0.49	Pt-Co Color Units	Waters	450 nm	2-Dec-08
10-308-00-1-C[R]	2.5- 100	0.6	Pt-Co Color Units	Waters	450 nm	4-Nov-10
Conductivity						
10-302-00-1-A 10-302-00-A52[R]	5.94-575	0.5	µS/cm	Waters	QC8000 ONLY Dedicated channel required. QC8500 S2 method only.	29 Nov-07
Copper						
10-129-17-1-A[R]	0.02 – 3.0	0.003	mg Cu/L	Waters	Bathocuprine method; 480 nm.	26-Sep-08
Cyanide						
10-204-00-1-A#	0.005 – 0.5	0.0005	mg CN^-/L	Waters	**Total Cyanide** Macro distillation method; 0.25 M NaOH matrix following distillation; Pyridine/barbituric acid, 570 nm. NPDES / NPDWR Accepted; follows Standard Methods (4500-CN). **Requires a standard heater.**	29-Nov-07
10-204-00-1-D[R]	0.20 – 10.0	0.003	mg CN^-/L	Waters	**Total Cyanide** Acetate buffer; 0.25 M NaOH matrix following distillation. Pyridine/ barbituric acid, 570 nm. **Requires a standard heater.**	18-Sep-03
10-204-00-1-G[R]	2.0 – 500	0.5	µg CN^-/L	Waters	Macro distillation method; 0.25 M NaOH matrix following distillation; pyridine-free reagents (isonicotinic/barbituric acid). 600 nm. **Standard heater required.**	16-Sep-03
10-204-00-1-H	0.002 – 0.01 0.1 – 5.0	0.00047 0.0138	mg CN^-/L	Waters	**Free Cyanide**; isonicotinic/barbituric acid. 600 nm. pyridine-free reagents; can be used w/ 10-204-00-2-G for inline total CN; multi-range method; **Requires a standard heater.**	7-Jun-06
10-204-00-1-J	25-1000	1.4	µg CN-/L		Total or WAD CN; Off-line Distillation. Pyridine/pyrazolone method. JIS K0102	31-Oct -14
10-204-00-1-X#	0.005 – 0.50	0.001	mg CN^-/L	Waters	**Total Cyanide**; MicroDIST® method; 0.25 M NaOH matrix following distillation; Pyridine/barbituric acid, 570 nm. NPDES/NPDWR approved method **Requires a standard heater.**	29-Nov-07

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-204-00-1-X2#^	0.002 – 0.5	0.00038	mg CN^-/L	Waters	**Total Cyanide**; MicroDIST® method; 0.25 M NaOH matrix following distillation; Pyridine/barbituric acid, 570 nm. Ultra-High Throughput method (>125 samples/hr); NPDES Equivalent / NPDWR Accepted **Requires a standard heater.**	16-Apr-08
10-204-00-2-C	2 – 100	0.21	µg CN^-/L	Waters	**Total Cyanide**; inline method; low-flow method;; Pyridine/barbituric acid, 570 nm**.** Samples w/ particulates not suitable **Inline module and Standard heater required.**	14-Sep-07
10-204-00-2-D	5 – 500	0.51	µg CN^-/L	Waters	**Total Cyanide**; inline method; low-flow method; Pyridine/barbituric acid, 570 nm**.** ; Samples w/ particulates not suitable **Inline module and Standard heater required.**	19-Sep-07
10-204-00-2-E^R	2 – 100	0.5	µg CN^-/L	Waters	**Total Cyanide**; inline method; low-flow method; lower recovery of ferricyanide; Pyridine/barbituric acid, 570 nm**.** Samples w/ particulates not suitable **Inline module, Standard heater required**	3-Dec-08
10-204-00-2-G^R	0.002 – 0.01 0.1 – 5.0	0.00016 0.015	mg CN^-/L	Waters	**Total Cyanide**; inline method; pyridine-free reagents; can be used w/ 10-204-00-2-H for free cyanide; 600 nm multi-range method; Samples w/ particulates not suitable. **In-line module and standard heater required.**	22-Jun-07
10-204-00-4-B^R	2.0 – 100	0.16	µg CN^-/L	Waters	**WAD Cyanide**; inline method; pyridine-free reagents; Isonicotinic/barbituric acid 600 nm. samples w/ particulates not suitable; **MANIFOLD ONLY**	27-Jul-07
10-204-00-4B52^R					DEDICATED 220V CHANNEL FOR QC8500 Isonicotinic/barbituric acid 600 nm. samples w/ particulates not suitable **Requires 2 channels, two heaters, one detector and one valve)**	
10-204-00-4-C^R	2.0 – 100	0.17	µg CN^-/L	Waters	**WAD Cyanide**; Low Flow Method. In line distillation method; pyridine-free reagents; Isonicotinic/barbituric acid 600 nm. Samples w/	11-Mar-13

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
					particulates not suitable; **Requires an inline module and a standard heater.**	
Fluoride			***See also IC section***			
10-109-12-2-AS2#	0.10 – 5.0	0.05	mg F^-/L	Waters	Ion Selective Electrode methods QC8500 Series 2 specific. NPDES / NPDWR Accepted; follows Standard Methods (4500-F-B); **Requires a fluoride detector module**	23-Dec-09
10-109-12-2-CS	0.1-2.0	0.02	mg F/L	Waters	Ion Selective Electrode method. QC8500 Series 1 specific. NPDES Equivalent. Follows Standard Methods 4500 F-B. Requires a Fluoride Detector Module	27 Aug 2003
Formaldehyde						
10-221-00-1-D^R	0.01-1.0 0.25-10.0	0.002 0.05	mg HCHO/L	Waters	Acetylacetone method. 410 nm. **Requires a standard heater.**	07-Apr-15
Glucose (Reducing Sugars)						
26-201-00-1-B^R	10 – 500	NA	mg glucose/L	Tobacco extracts	Ferricyanide method; 420 nm. 5% Acetic acid. **Requires a standard heater.**	18-Nov-08
Hardness						
10-301-31-1-A ^{R}*#	5 – 300	0.331	mg $CaCO_3$/L	Waters	Total hardness; calmagite method 630 nm; NPDES Accepted (130.1);	2-Jul-09
Hydroxide						
25-225-25-1-G^R	70 – 200		g NaOH/L	Chlor-Alkali	Determination in diaphragm or mercury cell liquors; EDA/copper sulfate method. 630 nm. **1 mm path length flow cell, NO internal sample loop valve**	03-Nov-10

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
Hypochlorite						
25-226-36-1-B	1.25 – 10	0.20	mg NaOCl/L	Chlor-Alkali	Methyl-orange method; 550 nm. dialysis method	19-Oct-05
25-226-36-1-G^{R}	3-75	0.6	mg NaOCl/L	Chlor-Alkali	Determination in diaphragm cell liquors; potassium iodide method 410 nm.	25-Apr-13
Iodide						
10-136-09-1-A^{R}	0.50 – 10.0	0.3	µg I^-/L	waters	0.2M KOH 420 nm;. **Requires a standard heater**	12-Sep-03
Iron						
10-126-18-1-A^{R}	0.1 – 5.0	0.01	mg Fe/L	Waters	Total soluble iron as Fe (II and III); TPTZ indicator; 590 nm. **Inert sample probe required.**	12-Sep-03
10-126-18-1-D^{R}	0.1 – 5.0 0.05 – 5.0	0.01	mg Fe/L	Waters	Total soluble iron as Fe (II and III); Ferrozine indicator; 560 nm. Determination in 0.5% HNO_3 matrix (preservation); dual-range method **Inert sample probe required.**	6-Jul-09
31-126-18-1-A^{R}	0.5-30 mg Fe/L	0.024	mg Fe/L	Brackish / Seawaters	Total soluble iron as Fe (II and III); TPTZ indicator. 600 nm. **Inert sample probe required.**	15-Sep-03
31-126-18-1-B^{R}	0.05 – 0.500 0.895-8.95	0.004	mg Fe/L µg Fe/L	Brackish / Seawaters	Total soluble iron as Fe (II and III); TPTZ indicator. 600 nm. **Inert sample probe required.**	15-Sep-03
31-126-19-1-A^{R}	0.50 – 30.0 0.00895-0.537	0.23	mg Fe/L mM Fe/L	Brackish / Seawaters	Total soluble iron as Fe (II); TPTZ indicator 600 nm. **Inert sample probe required.**	26-Nov-08
Kjeldahl Nitrogen (TKN)						

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-107-06-2-D#	0.5 – 20	0.07	mg N/L	Waters	Kjeldahl digests; Salicylate/nitroprusside; 660 nm. mercury catalyst; NPDES Accepted. **Requires a standard heater.**	1-May-01
10-107-06-2-E #	0.1 – 5.0	0.018	mg N/L	Waters	Kjeldahl digests; Salicylate/nitroprusside; 660 nm. mercury catalyst; NPDES Accepted. **Requires a standard heater**.	5-Dec-07
10-107-06-2-H^{R} ^	0.1 – 5.0	0.034	mg N/L	Waters	Kjeldahl digests; Salicylate/ nitroprusside; 660 copper catalyst; NPDES Equivalent (351.2); follows Standard Methods (4500-N_{ORG} D). nm. **Requires a standard heater.**	13-May-08
10-107-06-2-I ^{R}^	0.5 – 20.0	0.10	mg N/L	Waters	Kjeldahl digests; Salicylate/ nitroprusside; 660 copper catalyst; NPDES Equivalent (351.2). **Requires a standard heater.**	14-May-08
10-107-06-2-K^{R} ^	0.1 – 20.0	0.0093	mg N/L	Waters	Kjeldahl digests; mercury catalyst; Salicylate/ nitroprusside; 660 low-flow method; NPDES Equivalent (351.2) **Requires a standard heater.**	15-May-08
10-107-06-2-M^{R}^	0.25 – 25	0.05	mg N/L	Waters	Kjeldahl digests; Salicylate/ nitroprusside; 660 nm, copper catalyst; NPDES Equivalent (351.2) **Requires a standard heater.**	27-Mar-06
10-107-06-2-N^{R}^	0.5 – 20 0.1 – 5.0	0.02 0.04	mg N/L	Waters	Kjeldahl digests Salicylate/ nitroprusside; 660 nm; mercury catalyst; Ultra High Throughput method (>125 samples/hr.); multi-range method; NPDES Equivalent (351.2) **Requires a standard heater.**	12-Sep-07
10-107-06-2-P ^{R}^	0.25 – 25	0.056	mg N/L	Waters	Kjeldahl digests; Salicylate/ nitroprusside; 660 nm. copper catalyst; Ultra High Throughput method (>125 samples/hr.); NPDES Equivalent (351.2). **Requires a standard heater.**	14-Apr-08
10-107-06-2-Q^{R}^	0.5 – 20.0 0.1 – 5.0	0.1 0.04	mg N/L	Waters	Kjeldahl digests; Salicylate/ nitroprusside; 660 nm mercury catalyst; low-flow method; multi-range method NPDES Equivalent (351.2). **Requires a standard heater.**	8-Dec-09
10-107-06-2-S^{R}	0.2-20	0.01	mg N/L	Waters	**Simplified TKN (s-TKN^{TM}).** 520 nm, cadmium reduction . Two channel method TN and	14-Jul-10

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
					NO_2+ NO_3. S-TKN by subtraction. **Requires an in-line module**	
10-107-06-2-X^R^	0.05-20	0.033	mg N/L	Waters	Sodium Salicylate method for MicroDist ™ distillates. Requires a **MicroDist™ block and tubes.** Preserved or unpreserved samples. 660nm. Requires a standard heate. NPDES Equivalent (350.1).	17-Aug-15
10-107-06-5-J	0.1-5.0 0.25-20	0.02 0.05	mg N/L	Waters	Kjeldahl Digests, Salicylate/DCIC **660 nm. copper catalyst**. Gas diffusion method. Sea/brackish water. Can also be used for Ammonia	26-Sept-12
10-107-06-6-D^	0.5 – 20	0.25	mg N/L	Waters	Kjeldahl digests; **copper catalyst**; inline distillation method; NPDES Equivalent (351.2); samples w/ particulates not suitable. 660 nm. Can be used with brackish/seawater digests. **Requires an in-line module and a standard heater or two heated channels (with one heater non-standard).**	31-Jul-09
13-107-06-1-A^R	1.0 – 25.0	0.1	mg N/L	Plant digests	Kjeldahl digests; selenium oxide catalyst Phenate; 630 nm. **Requires a standard heater.**	15-Sep-03
13-107-06-2-D^R*	10 – 150	0.5	mg N/L	Plant digests	Kjeldahl digests; copper catalyst; low-flow method Salicylate/ nitroprusside; 660 nm. **Requires a standard heater.**	29-Oct-07
13-107-06-2-G^R*	1 – 50	0.12	mg N/L	Plant digests	Kjeldahl digests; selenium oxide catalyst; requires 10% sulfuric acid digest Salicylate/ nitroprusside; 660 nm. **Requires a standard heater.**	15-Sep-03
14-107-06-2-A^R	5.0 – 200	0.04	mg N/L	Fertilizers	Kjeldahl digests; selenium oxide catalyst Salicylate/ nitroprusside; 660 nm. **Requires a standard heater.**	15-Sep-03

Kjeldahl Phosphorus (TKP)

	Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-115-01-1-C^{R}#	0.1 – 5.0	0.015	mg P/L		Waters	Total P; Kjeldahl digests; mercury catalyst; molybdate based method; 880 nm. NPDES Accepted. **Requires a standard heater.**	15-May-01
10-115-01-1-D^{R}#	0.05 – 0.5	0.002	mg P/L		Waters	Total P; Kjeldahl digests; mercury catalyst; molybdate based method; 880 nm **Requires a standard heater.** NPDES Accepted	26-Dec-00
10-115-01-1-I^{R}^	0.1 – 5.0	0.007	mg P/L		Waters	Total P; Kjeldahl digests; mercury catalyst; molybdate based method; ; 880 nm **Requires a standard heater.** NPDES Equivalent (365.4); Ultra High Throughput method (>100 samples/hr)	28-Aug-07
10-115-01-2-B^{R}^	0.10 – 10	0.010	mg P/L		Waters	Total P; Kjeldahl digests; copper catalyst; molybdate based method; ; 880 nm **Requires a standard heater.** NPDES Equivalent (365.4)	27-Mar-06
10-115-01-2-C^{R}^	0.1 – 5.0	0.025	mg P/L		Waters	Total P; Kjeldahl digests; copper catalyst; molybdate based method; Ultra High Throughput method (>120 samples/hr) ; 880 nm . NPDES Equivalent (365.4);. **Requires a standard heater.**	4-Apr-08
13-115-01-1-B^{R}*	1.0 – 50.0	0.08	mg P/L		Plant extracts	Total P; Kjeldahl digests; copper catalyst; molybdate based method; 880 nm **Requires a standard heater.**	26-Oct-06
Lactose							
21-250-00-2-A	0.6-5.4	0.15	% Lactose		Dairy	Lactose in dairy products. Two channel method. (Phosphate). Alkaline Ferricyanide. 420nm. 20 samples per hour. **Requires a standard heater. Pump speed is 20**	23 Nov 2016
Manganese							
10-131-35-1-B^{R}	0.2 – 10	0.005	mg Mn/L		Waters	Manganese II Formaldoxime, **0.15% HNO_3** matrix 460 nm.	15-Sep-03
12-131-35-1-A^{R}	0.5 – 2.0	0.01	mg Mn/L		Soil extracts	Low-flow method; **0.1N HCl.** Formaldoxime, 460 nm.	15-Sep-03

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
Monochloramine						
10-245-00-1-A	0.01 – 2.0	0.0028	mg N/L as NH_4Cl	Waters	Alkaline phenol-based method; 630 nm; **requires a standard heater**. low-flow method; **Use w/ 10-107-06-1-L for free ammonia**	5-Nov-07
Nitrate + Nitrite		***See also IC section***				
10-107-04-1-A #R*	0.2 – 20.0	0.01	mg N/L	Waters	Sulfanilamide/NED. Cd reduction method; 520 nm. low-flow method; NPDES / NPDWR Accepted	29-Nov-07
10-107-04-1-B R#	0.002 – 0.10	0.0003	mg N/L	Waters	Cd reduction method; Sulfanilamide/NED. 520 nm. NPDES / NPDWR Accepted. Omnion 3.0/4.0 data added July 10 2015. Can be run as Ultra High Throughput (120/hr).	29-Nov-07
10-107-04-1-C R#	0.01 – 2.0 0.05-5.0	0.002 0.004	mg N/L	Waters	Sulfanilamide/NED. Cd reduction method; 520 nm. Ultra High Throughput method/120 samples per hour. NPDES / NPDWR Accepted; follows Standard Methods (4500-NO3-I) **Preserved or unpreserved samples with no pH adjustment needed for samples.**	14-Jul-08; High range support added 12-Apr-13
10-107-04-1-H^	5 – 80.0	0.027	mg N/L	Waters	Sulfanilamide/NED Cd reduction method; 520 nm. dialysis method;NPDES Equivalent (353.2).	1-May-08
10-107-04-1-J R #	0.10 – 10.0	0.012	mg N/L	Waters	Sulfanilamide/NED. Cd reduction method; dialysis method; 520 nm. dialysis method; NPDES / NPDWR Accepted	29-Nov-07
10-107-04-1-K R#	7-70 0.5 – 5.0	1.0 0.07	µg N/L µM N	Waters	Sulfanilamide/NED. Cd reduction method; 520 nm. low-flow method; NPDES / NPDWR Accepted Omnion 3.0/4.0 data added July 10 2015.	29-Nov-07
10-107-04-1-L R #	0.02 – 2.0	0.002	mg N/L	Waters	Sulfanilamide/NED. Cd reduction method; 520 nm. low-flow method; NPDES / NPDWR Accepted	29-Nov-07
10-107-04-1-M R	0.25 – 14	0.042	µg N/L	Waters	Sulfanilamide/NED Cd reduction method; 540 nm. **2-cm detector method; QC8500 only. Requires a standard heater.** PN 58112 allows replicate injections from a single sample tube.	25-Feb-09
10-107-04-1-O R #	0.05 – 10.0	0.007	mg N/L	Waters	Sulfanilamide/NED. Cd reduction method; 520 nm. NPDES / NPDWR Accepted	29-Nov-07

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-107-04-1-Q^R^	0.005 – 0.8 0.5 – 10	0.0005 0.022	mg N/L	Waters	Cd reduction method; low-flow method; Sulfanilamide/NED imidazole buffer; 520 nm. determination in non-preserved and acid preserved samples; multi-range method;. NPDES Equivalent (353.2)	10-Aug-06
10-107-04-1-R^R#^*	0.002 – 0.25	0.0005	mg N/L	Waters	Sulfanilamide/NED. Cd reduction method; 520 nm. Ultra High Throughput method	16-Apr-08
	0.025 – 20	0.0012			(>120 samples/hr.); multi-range method; NPDES Equivalent; NPDWR Accepted	
10-107-04-2-A^R# *	2 – 100	0.1	mg N/L	Waters	Sulfanilamide/NED.Hydrazine reduction. 520 nm. NPDES/NPDWR Accepted; follows Standard Methods (4500-NO3-I). **Requires a standard heater.**	29-Nov-07
10-107-04-2-D^R #	0.05 – 7	0.006	mg N/L	Waters	Sulfanilamide/NED. Hydrazine reduction; 520 nm. NPDES/NPDWR Accepted; follows Standard Methods (4500-NO3-I) **Requires a standard heater.** Omnion 4.0 data added 8 14 2015	14-Jan-02
10-107-04-5-A^R	0.02 – 5.0 0.2 – 20	0.009 0.023	mg N/L	Waters	Sulfanilamide/NED **Nitrate Reductase method**; 540 nm. Reagents must be purchased from NECi; multi-range method.	9-Feb-09
10-107-04-6-A^R	0.05 – 5.0 0.2 – 20	0.005 0.022	mg N/L	Waters	Sulfanilamide/NED UV Nitrate Reduction; PATENTED 540 nm. **In-line module with UV lamp required.** Multi-range method	4-Sep-09
12-107-04-1-A^R	0.2 – 40.0		mg N/L	Soil extracts	Sulfanilamide/NED Cd reduction method; 520 nm determination in **1mM $CaCl_2$** soil extracts	15-Sep-03
12-107-04-1-B^R	0.025 – 20.0	0.005	mg N/L	Soil extracts	Sulfanilamide/NED Cd reduction method; 520 nm determination in **2M KCl** soil extracts;	21-Aug-03
12-107-04-1-E^R	0.05 – 5.0		mg N/L	Soil extracts	Hydrazine reduction. Sulfanilamide/NED 520 nm **1M KCl** soil extracts.	15-Sep-03
12-107-04-1-F^R	0.01 – 2.0	0.0013	mg N/L	Soil extracts	Sulfanilamide/NED Cd reduction method; 520 nm determination in **2M KCl** soil extracts	30-Jan-15
12-107-04-1-G^R	1.0 – 20.0	0.01	mg N/L	Soil extracts	Sulfanilamide/NED Cd reduction method; 520 nm determination in **0.0125M $CaCl_2$** soil extracts	15-Sep-03
12-107-04-1-J^R	0.025-20	0.003	Mg N/L	Soil Extracts	Sulfanilamide.NED Cd Reduction Method. 520 nm. Ultra High Throughout method; 120 samples per hour. **2M KCl** extracts of soils.	15-Aug-07

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
14-107-04-1-B	30 – 300	0.38	mg N/L	Fertilizers	Sulfanilamide/NED Cd reduction method; 520 nm. Dialysis method	15-Sep-03
20-107-04-1-B^{R}	0.025 – 0.5 0.25 – 5.0	 0.018	mg NO_2^-/L mg NO_3^-/L	Food stuffs	Sulfanilamide/NED Cd reduction method; 540 nm. Dialysis method; determination in **dairy products**; ISO (14673-3)	16-Sep-03
20-107-04-1-C^{R}	0.025 – 1.0	0.002	mg NO_2^-/L	Food stuffs	Sulfanilamide/NED Cd reduction method; 540 nm. Dialysis method; determination	25-Mar-08
30-107-04-1-C^{R}^	0.05 – 2.0 **3.57-142.86**	0.0029	mg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cd reduction method; 520 nm multi-range method; NPDES Equivalent (353.2).	20-Nov-08
31-107-04-1-A^{R}^	0.1 – 10 **0.0071-0.713** 17.5 – 70 **1.25-5.0**	0.0049 0.126	mg N/L **mM N/L** µg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cd reduction method; 520 nm. NPDES Equivalent (353.2)	2-May-08
31-107-04-1-C^{R}^	0.07 – 0.70 **5.0-50.0**	0.00168	mg N/L **µM N/L**	Brackish/ Seawaters	Sulfanilamide/NED Cd reduction method; 520 nm.NPDES Equivalent (353.2)	2-May-08
31-107-04-1-D^{R}^	0.5 – 14 **0.036-1.0**	0.2	µg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cd reduction method; 540 nm NPDES Equivalent (353.2). .**Requires a standard heater**.	2-May-08
31-107-04-1-E^{E}^	5 – 400 **0.36-28.57**	0.51	µg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cd reduction method; 540 nm NPDES Equivalent (353.2).	19-Aug-03
31-107-04-1-F^{R}^	0.25 – 14 **0.018-1.0**	0.042	µg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED. Cd reduction method; 540 nm. 2-cm detector method; **QC8500 only**; NPDES Equivalent (353.2). **Requires a standard heater.**	8-Jul-08
31-107-04-1-G^{R}^	0.25 – 10 **0.018-0.714** 0.01– 1.0 **0.714-71.43**	0.05 0.002	mg N/L **mM N/L** mg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cd reduction method; 540 nm Ultra High Throughput method . (>120 samples/hr); multi-range; NPDES Equivalent (353.2)	24-Apr-08
31-107-04-1-H^{R}^	0.25 – 30 **0.18-2.143**	0.025	mg N/L **mM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cd reduction method; 540 nm can also use w/ non-saline matrix; NPDES Equivalent (353.2)	28-Oct-08
31-107-04-1-I^{R}	5 – 500 **0.357-35.71**	0.025	mg N/L **mM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cd reduction method; 540 nm. Ultra high level, inline dialysis method	12-Jul-09

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
31-107-04-1-J^{R}^	1-100 **0.071-7.143**	0.2	µg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cd reduction method; 520 nm. NPDES Equivalent (353.2)	30-Jun-10
31-107-04-1-K^{R}	1-100 **0.071-7.143**	0.2	µg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED, Cd reduction method. **Imidazole buffer**. 540 nm. NPDES Equivalent (353.2)	20-May-11
31-107-04-5-A^{R}	0.01 – 5.0 **1.43-357.14**	0.009	mg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED **Nitrate Reductase method**; 540 nm. Enzymatic reagents must be purchased from NECi.	11-Feb-09
31-107-04-6-A^{R}	0.05 – 5.0 **0.0036-0.357** 0.2-20.0 **0.0143-1.43**	0.006	mg N/L **mM N/L** mg N/L **mM N/L**	Brackish / Seawaters	**UV Nitrate Reduction**; Sulfanilamide/NED 540 nm. Multi-range method PATENTED. **Requires an in-line module with UV lamp.**	19-Jun-09
80-107-04-1-A^{R}^	0.001-0.10 0.01-1.0 0.10-10.0	0.002 0.001 0.002	mg N/L	Waters	Sulfanilamide/NED. Cadmium reduction. 520 nm**. Ultra-Low Flow Method.** Pump runs at 10, must be run alone or with another ultra-low flow method. NPDES equivalent (353.2). Multi range method.	10-Jun-09
90-107-04-2-A^{R}	0.1-6.0		mg N/L	Water/Soils	Sulfanilamide/NED Hydrazine Reduction. 520 nm. Multiple Matrix Method. **Water, 2M KCl, 0.5M K_2SO_4, 0.01M $CaCl_2$.**	27-Jan-11

Nitrite

See also IC section

10-107-05-1-A^{R} # ^	0.01 – 10.0	0.005	mg N/L as NO_2^-	Waters	Nitrite only; Sulfanilamide/NED 520 nm. NPDES Equivalent / NPDWR Accepted (353.2)	29-Nov-07
10-107-05-1-B ^{R}^	0.014 – 0.07	0.0004	mg N/L as NO_2^-	Waters	Nitrite only; Sulfanilamide/NED 520 nm. Low-flow method; NPDES Equivalent (353.2)	12-May-08
10-107-05-1-C^{R} ^	0.02 – 2.0	0.0016	mg N/L as NO_2^-	Waters	Nitrite only; Sulfaniliamide/NED 520 nm. Low-flow method; NPDES Equivalent (353.2)	21-Aug-03
10-107-05-1-E^{R}	0.05 – 5.0 0.2 – 20	0.03 0.0008	mg N/L as NO_2^-	Waters	Nitrite only**;** Sulfanilamide/NED 540 nm. **companion method for UV reduction method**	9-Sep-09

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-107-05-1-F^{R}^	4-400	0.46	µg N/L as NO2-	Waters	Nitrite only; Sulfaniliamide/NED 520 nm. Low-flow method; NPDES Equivalent (353.2)	22-Feb --10
31-107-05-1-A^{R}^	17.5 – 70 **1.25-5.0**	**0.01**	µg N/L as NO_2^- **µM N/L as NO_2^-**	Brackish / Seawaters	Nitrite only; Sulfanilamide/NED 540 nm. NPDES Equivalent (353.2)	13-May-08
31-107-05-1-B^{R}^	0.1 – 15 **0.007-1.07**	0.01	mg N/L as NO_2^- **mM N/L as NO_2^-**	Brackish / Seawaters	Nitrite only; Sulfanilamide/NED 540 nm. NPDES Equivalent (353.2)	29-Oct-08

Nitrogen - Total Nitrogen

10-107-04-3-A^{R}*	200 – 2000	5.6	µg N/L	Waters	Sulfanilamide/NED Cadmium Reduction;540 nm. Total N; inline method; alkaline persulfate digestion; samples w/ particulates not suitable. **In-line sample prep module required. Nitrate/Nitrite support added**.	16-Nov-09
10-107-04-3-B ^{R}*	0.5 – 30.0	0.1	mg N/L	Waters	Sulfanilamide/NED imidazole buffer; Cadmium Reduction; 540 nm. Total N; inline method; alkaline persulfate digestion method; samples w/ particulates not suitable. **In-line sample prep module required. Nitrate/Nitrite support added**.	16-Nov-09
10-107-04-3-C^{R}	0.5 – 10.0	0.011	mg N/L	Waters	Sulfanilamide/NED Cadmium Reduction; 540 nm. Total N; inline method; alkaline persulfate digestion method; samples w/ particulates not suitable. **In-line sample prep module required.**	29-Jun-07
10-107-04-3-D^{R}	0.05 – 5.0 0.2 – 20.0	0.003 0.008	mg N/L	Waters	Sulfanilamide/NED Cadmium Reduction; 540 nm. Total N; inline method; alkaline persulfate digestion; samples w/ particulates not suitable. **In-line sample prep module required. Nitrate/Nitrite support added**.	2-Dec-12
10-107-04-3-E^{R}	0.05 – 10	0.005	mg N/L	Waters	Sulfanilamide/NED; Cadmium Reduction; 540 nm. Total N; inline method; alkaline persulfate digestion; samples w/ particulates not suitable **In-line sample prep module required.**	12-Nov-10
10-107-04-3-P^{R}	0.2 – 10.0	0.05	mg N/L	Waters	Sulfanilamide/NED; Cadmium Reduction; 540 nm. Total N; inline method; alkaline persulfate digestion; follows Standard Methods (4500-N-B); samples w/ particulates not suitable.	29-Jun-07

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-107-04-4-A[R]	0.5 – 10	0.02	mg N/L	Waters	Sulfanilamide/NED Cadmium reduction. 520nm. Total N; **manual** alkaline persulfate digestion; low-flow method.	11-Jan-10
10-107-04-4-B[R]	0.02 – 5.0 1.00 – 40.0	0.006 0.024	mg N/L	Waters	Sulfanilamide/NED Cadmium Reduction; 520 nm. Based upon Standard Method 4500-N_{org} (proposed)Total N; dual **manual** persulfate digest; **total phosphorus can be measured from same digest (10-115-01-4-B);** multi-range method**. Nitrate/Nitrite support added**.	22-Jun-07
10-107-04-4-C[R]	0.05-5.0	0.02	mg N/L	Waters	Sulfanilamide/NED. cadmium reduction. Imidazole buffer 540nm. **Single-step**, off-line (autoclave) digestion method. **TP can be measured from the same digestate.**	18-Jun-13
12-107-04-3-B	0.2 – 30.0	0.04	mg N/L	Soil extracts	Sulfanilamide/NED Cadmium reduction. 540 nm. Total N; alkaline persulfate digestion; **0.5M K_2SO_4** extracts of soils; **inline module required**; samples w/ particulates not suitable.	13-Nov-09
12-107-04-3-C	0.375-30	0.05	mg N/L	Soil extracts	Sulfanilamide/NED Cadmium reduction, 540 nm. Total N; **0.5M K_2SO_4** extracts of soils; **inline module required**; persulfate digestion; samples w/ particulates not suitable. Dissolved Organic Carbon may be measured in the same digest using 12-140-39-5-A	
31-107-04-3-A[R]	25 – 1000 **1.79-71.43**	4.90	µg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cadmium reduction,540 nm. Total N; alkaline persulfate inline digestion method; samples w/ particulates not suitable.	3-Feb-10
31-107-04-4-B[R]	0.02– 5.00 **1.43-357.14** 1.0– 40.0 **0.071-2.86**	0.0068 0.111	mg N/L **µM N/L** mg N/L **mM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cadmium reduction, 520 nm. Total N; **manual persulfate** digestion w/ Cd reduction; low-flow method; **total phosphorus can be measured from same digest (31-115-01-4-B);** multi-range method.	16-Jun-08
31-107-04-4-C[R]	0.02– 5.00 **1.43-357.14** 1.0– 40.0 **0.071-2.86**	0.0068 0.111	mg N/L **µM N/L** mg N/L **mM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cadmium reduction, 520 nm. Total N; **manual dual persulfate digestion** Imidazole buffer; low-flow method; total phosphorus can be measured from same digest (31-115-01-4-B**);**	21-Feb-12

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
NO_2 + NO_3-N: 2.5-500	0.44	µg N/L **µM N/L**			**Can also use for NO_2 + NO_3 and NO_2.** (Support for NO_2 + NO_3 and NO_2 included).	
NO_2- N: 1-125	0.2	µg N/L **µM N/L**				

Orthophosphate

See also IC section

10-115-01-1-A^R#	0.01 – 2.0 1.0-20	0.002 0.017	mg P/L as PO_4^{2-} mg P/L as PO_4^{2-}	Waters	Orthophosphate; molybdate based method; 880 nm. NPDES/NPDWR Accepted; follows Standard Methods (4500-P-G). **Requires a standard heater.**	29-Nov-07
10-115-01-1-B^R#	0.01 – 0.20	0.0007	mg P/L as PO_4^{2-}	Waters	Orthophosphate; molybdate based method; 880 nm. NPDES/NPDWR Accepted. **Requires a standard heater.**	29-Nov-07
10-115-01-1-M^R#	1 – 100	0.1	µg P/L as PO_4^{2-}	Waters	Orthophosphate; molybdate based method; 880 nm. NPDES/NPDWR Accepted. **Requires a standard heater.** Omnion 4 data added June 22 2015	29-Nov-07
10-115-01-1-O^R*^	1.0 – 20	0.045	mg P/L as PO_4^{2-}	Waters	Orthophosphate; molybdate based method; NPDES Equivalent (365.1); Ultra-High Throughput method (>120 samples/hr). 880 nm. **Requires a standard heater.**	16-Dec-07
10-115-01-1-P^R#	0.05 – 2.00	0.005	mg P/L as PO_4^{2-}	Waters	Orthophosphate; molybdate based method; 880 nm. low-flow method; NPDES/NPDWR Accepted. **Requires a standard heater.**	29-Nov-07
10-115-01-1-Q^R#	0.010 – 0.20	0.0003	mg P/L as PO_4^{2-}	Waters	Orthophosphate; molybdate based method; 880 nm. low-flow method; NPDES/NPDWR Accepted. 880 nm. **Requires a standard heater.**	29-Nov-07
10-115-01-1-V ^{R}#*	0.01 – 2.0 0.2 – 20.0	0.0012 0.0046	mg P/L as PO_4^{2-}	Waters	Orthophosphate; molybdate based method; 880 nm. multi-range method; NPDES Equivalent / NPDWR Accepted; Ultra-High Throughput method (>125 samples/hr). PN58112 allows replicate injections from single sample tubes. **Requires a standard heater**	16-Apr-08

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-115-01-1-W^{R}*^	0.25 – 20	0.046	µg P/L as PO_4^{2-}	Waters	Orthophosphate; molybdate based method; 880 nm. 2-cm detector method; QC8500 only; **for samples with very low or no silicate**; NPDES Equivalent (365.1). PN 58112 allows replicate injections from single sample tubes. **Requires a non-standard heater.**	22-Feb-08
10-115-01-1-Y ^{R}*^	0.5 – 100	0.164	µg P/L as PO_4^{2-}	Waters	Orthophosphate; molybdate based method; 880 nm. 2-cm detector method; QC8500 only; **for samples with high silicate**; NPDES Equivalent (365.1) **Requires a non-standard heater.**	21-Jul-08
12-115-01-1-A^{R}	0.25 – 10.0		mg P/L as PO_4^{2-}	Soil extracts	Orthophosphate; molybdate based method; 880 nm. determination in **Mehlich III** soil extracts. **Requires a standard heater.**	17-Sep-03
12-115-01-1-B^{R}	0.01 – 1.0	0.006	mg P/L as PO_4^{2-}	Soil extracts	Orthophosphate; molybdate based method; 880 nm. determination in **0.5 M bicarbonate** (Olsens) soil extracts. **Requires a standard heater**	17-Sep-03
12-115-01-1-E^{R}	0.25 – 10.0	0.02	mg P/L as PO_4^{2-}	Soil extracts	Orthophosphate; molybdate based method; 880 nm. determination in **0.5 M acetic acid, 0.5 M ammonium acetate** soil extracts. **Requires a standard heater**	17-Sep-03
12-115-01-1-K^{R}	1.0 – 30.0		mg P/L as PO_4^{2-}	Soil extracts	Orthophosphate; molybdate based method; 880 nm. determination in **Morgans** soil extracts. **Requires a standard heater**	17-Sep-03
12-115-01-1-L^{R}	0.05 – 6.0	0.01	mg P/L as PO_4^{2-}	Soil extracts	Orthophosphate; molybdate based method; .880 nm. determination in **Morgans** soil extracts. **Requires a standard heater**	17-Sep-03
12-115-01-1-M^{R}	0.25 – 10	0.04	mg P/L as PO_4^{2-}	Soil extracts	Orthophosphate; molybdate based method; determination in **Mehlich III** soil extracts. 880 nm. Ultra-High Throughput method **(**120 samples per hour) **Requires a standard heater**	21-Jun-06
12-115-01-1-N^{R}	0.4 – 20	0.07	mg P/L as PO_4^{2-}	Soil extracts	Orthophosphate; molybdate based method; 880 nm. determination in **Bray 1, Bray 2, Mehlich I**, **Mehlich III** soil extracts Ultra-High	04-Sep-07

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
					Throughput method (>120 samples/hr) **Requires a standard heater**	
12-115-01-1-O^{R}	0.1-5.0	0.002	mg P/L as PO_4^{2-}	Soil extracts	Orthophosphate; molybdate based method; 880 nm. determination in **0.1N HCl** soil extracts. **Requires a standard heater**	15-Dec-10
12-115-01-1-Q^{R}	0.1-10 0.01-1.0	0.004 0.02	mg P/L as PO_4^{2-}	Soil Extracts	Orthophosphate; molybdate based method; 880 nm. determination in **0.5 M bicarbonate** (Olsen's) soil extracts. Improved throughput - no gas diffusion block needed. **Requires a standard heater.**	02Feb-15
20-250-00-2-A	2-30	0.4	mM PO_4^{2-}/L	Dairy	PO_4^{2-} in dairy products. 2 channel method. Dialysis to exclude fats and proteins. **Pump speed of 20.** Metavanadate chemistry. 420 nm. **20 samples per hour.**	23 Nov 2016
31-115-01-1-G^{R}^	62 – 310 **2.0-10.0**		µg P/L as PO_4^{2-} **µM P/L as PO_4^{2-}**	Brackish / Seawaters	Orthophosphate; molybdate based method; 880 nm. NPDES Equivalent (365.5). **Requires a standard heater**	13-May-08
31-115-01-1-H^{R}^	5 – 400 **0.16-12.9**	1.0	µg P/L as PO_4^{2-} **µM P/L as PO_4^{2-}**	Brackish / Seawaters	Orthophosphate; molybdate based method; 880 nm. NPDES Equivalent (365.5). **Requires a standard heater**	13-May-08
31-115-01-1-I^{R}^	1-100 **0.032-3.23**	0.25	µg P/L as PO_4^{2-} **µM P/L as PO_4^{2-}**	Brackish / Seawaters	Orthophosphate; molybdate based method; 880 nm. NPDES Equivalent (365.5) **Requires a standard heater**	13-May-08
31-115-01-1-J^{R}^	0.01 – 2.0 **0.323-64.52** 0.5-20 0.016-0.645	0.002 0.01	mg P/L as PO_4^{2-} **µM P/L as PO_4^{2-}** mg P/L as PO_4^{2-} **mM P/L as PO_4^{2-}**	Brackish / Seawaters	Orthophosphate; molybdate based method; 880 nm. NPDES Equivalent (365.5) **Requires a standard heater**	30-Nov-07
31-115-01-1-W^{R}^	0.25 – 20 **0.008-0.645**	0.007	µg P/L as PO_4^{2-} **µM P/L as PO_4^{2-}**	Brackish / Seawaters	Orthophosphate; molybdate based method; 880nm; 2-cm detector method; **QC8500 only**; **for samples with very low or no silicate**; NPDES Equivalent (365.5). **Requires a non-standard Heater** PN 58112 allows replicates from a single sample tube.	22-Feb-08
31-115-01-1-Y^{R}*^	0.5 – 100 **0.016-3.23**	0.164	µg P/L as PO_4^{2-} **µM P/L as PO_4^{2-}**	Brackish / Seawaters	Orthophosphate; molybdate based method; 880nm; 2-cm detector method**; QC8500 only**; for samples with high silicate; NPDES Eq. (365.5) **Requires a non-standard heater.**	29-Feb-08

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
					PN58112 allows replicates from a single sample tube.	
Phenol						
10-210-00-1-A^{R}#	5 – 200	0.6	µg phenol/L	Waters	Total recoverable phenol; 4-amino antipyrene method; 500 nm. Macro distillation method; NPDES Accepted.	14-Dec-01
10-210-00-1-B^{R} #	0.05 – 2.0	0.0013	mg phenol/L	Waters	4-amino antipyrene method; 500 nm. macro distillation method; NPDES Accepted.	18-Oct-07
10-210-00-1-F^{R}^	0.5-50	0.1	µg phenol/L	Waters	4-Aminoantipyrene with in-line chloroform extraction. 460nm. If samples are pre-distilled, the distillation must be done in glass. **2cm Detector required**. QC8500 ONLY. Must be run alone due to **Pump speed of 20.** 460nm NPDES Equivalent (420.4)	21 Dec 16
10-210-00-1-X ^	0.005 – 0.2 0.05-2.0	0.000856 0.0013	mg phenol/L	Waters	Total recoverable phenolics; MicroDIST® method; 4-aminoantipyrene method; 500 nm. multi-range method; NPDES Equivalent (420.4) .	3-Sep-09
10-210-00-3-A^{R} 10-210-00-3A51^{R} 10-210-00-3A52^{R}	2 – 200	0.28	µg phenol/L	Waters	Volatile phenol; 4-amino antipyrene method; 500 nm. inline method; samples w/ particulates not suitable; This PN **manifold only** QC8500 115V dedicated channel QC8500 220V dedicated channel	20-Dec-06
10-210-00-3-C*^ 10-210-00-3C51*^ 10-210-00-3C52*^	2 – 200	0.61	µg phenol/L	Waters	Volatile phenol; 4-aminoantipyrene method; 500 nm. inline method; NPDES Equivalent (420.4); samples w/ particulates not suitable. This PN **manifold only** QC8500 115V dedicated channel QC8500 220V dedicated channel	15-Oct-08
Phosphorus (Other)						
13-115-01-2-A^{R}	1.0 – 80	0.095	mg P/L	Plants	**Total P** in ashed plant material (**1M HCl matrix**); Vanadate based method 420 nm.	6-Feb-95

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
13-115-01-2-B^{R}	20 – 100	0.2	mg P/L	Plants	**Total P** in ashed plant material (**1M HCl** final **matrix**); Vanadate based method 420 nm	17-Sep-03
14-115-01-2-C^{R}	16.25 – 260	0.47	mg P_2O_5/L	Fertilizers	**Total P in fertilizers**; Vanadate based method; 420 nm. **HCl/HNO_3** digests; Assoc. of Florida Phosphate Chemists method.	17-Jul-08

Phosphorus, Total (Acidic Persulfate)

10-115-01-1-E^{R}#	0.2 – 10.0 0.025-5.0	0.1 0.013	mg P/L	Waters	Total P; **manual acidic persulfate digests**; molybdate based method; 880 nm; **requires a standard heater**. NPDES Accepted. 0.025-5.0 mg P/L range added 22 March 2016 (MDL 0.013)	8-Nov-01
10-115-01-1-F^{R} #	0.003 – 0.2	0.0009	mg P/L	Waters	Total P; **manual acidic persulfate digests**; molybdate based method; 880 nm; **requires a standard heater**. NPDES Accepted	5-Dec-07
10-115-01-3-A^{R}	0.1 – 10.0	0.007	mg P/L	Waters	Total P; acidic persulfate digests; molybdate method, 880 nm. Follows Standard Methods (4500-P-I); samples w/ particulates not suitable. **Requires an in-line sample prep module**. Can also use for orthophosphorus over the same range.	18-Nov-09
10-115-01-3-B^{R}*	0.1 – 4.0	0.01	mg P/L	Waters	Total P; acidic persulfate digests; molybdate method; 880 nm; samples w/ particulates not suitable **Requires an in-line sample prep module.** Can also use for orthophosphorus over the same range.	18-Nov-09
10-115-01-3-C ^{R}*	0.05 – 1.0	0.0011	mg P/L	Waters	Total P; acidic persulfate digests; molybdate method; 880 nm. Samples w/ particulates not suitable **Requires an in-line sample prep module.** Can also use for orthophosphorus over the same range.	18-Nov-09
10-115-01-3-E^{R}	10 – 500	1.4	µg P/L	Waters	Total P; acidic persulfate digests; molybdate method; 880 nm. Samples w/ particulates not suitable **Requires an in-line sample prep module and standard heater.** Can also use for orthophosphorus over the same range.	5-Jul-07

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-115-01-3-F[R]	2 – 100	0.42	µg P/L	Waters	Total P; acidic persulfate digests; molybdate method; 880 nm method; samples w/ particulates not suitable **Requires an in-line sample prep module and non-standard heater.**	13-Nov-06
10-115-01-4-B[R]	0.005 – 1.0 0.25 - 10	0.0006 0.024	mg P/L	Waters	Total P; **manual persulfate** digests; Molybdate method; 880 nm. Dual digest- **total nitrogen can be measured from same digest (10-107-04-4-B)**; Requires a block digester and glassware for the digestion; glass calibration vials. **Requires a standard heater.** Multi range method.	22-Jun-07
10-115-01-4-C[R]	0.01-1.0	0.002	mg P/L	Waters	Single step, off-line (autoclave) digestion method. Molybdate method. 880nm. **TN can be measured from the same digestate. (10-107-04-4-C) Requires a standard heater.**	26-Jun-13
10-115-01-4-I[R^]	0.2 – 20.0	0.026	mg P/L	Waters	Total P; **manual persulfate** digests; Molybdate method; 880 nm. Ultra-High Throughput method (120 samples /hour) NPDES Equivalent (365.3) **Requires a standard heater.**	11-Nov-08
10-115-01-4-J[R*]	0.2 – 10	0.0033	mg P/L	Waters	Total P; **manual persulfate** digests; Molybdate chemistry; 880 nm. Ultra-High Throughput method (>125 samples/hr) **Requires a standard heater.**	27-Aug-07
31-115-01-3-D[R]	0.050 – 1.0 **1.63-32.36**	0.002	mg P/L **µM P/L**	Brackish / Seawaters	Total P; molybdate method; 880 nm. inline persulfate digestion; samples w/ particulates not suitable. glass calibration vials. **Requires an in-line sample prep module.**	5-Jul-07
31-115-01-3-F[R]	2-100 **0.065-3.23**	0.59	µg P/L **µM P/L**	Brackish / Seawaters	Total P; molybdate based method; 880nm, inline persulfate digestion; samples w/ particulates not suitable **Requires glass standard and sample vials, an in-line sample prep module,and non-standard heater.**	13-Oct-08
31-115-01-4-A[R^]	12.5 – 400 **0.40-12.9**	1.66	µg P/L **µM P/L**	Brackish / Seawaters	Total P; molybdate based method; 880 nm. **manual persulfate** digestion; **Requires a standard heater and autoclave** for the digestion. NPDES Equivalent (365.3)	17-Sep-03
31-115-01-4-B[R]	0.005 – 1.0 **0.16-32.23**	0.0038	mg P/L **µM P/L**	Brackish / Seawaters	Total P; molybdate based method; 880nm, **manual persulfate** digestion; low-flow method; dual-	12-Dec-09

	Method No	Range	MDL	Units	Matrix	Comments	Rev Date
	0.25 – 10 **0.008-0.323**	0.0358	mg P/L **mM P/L**			Digest. **Total N Can be measured simultaneously using 31-107-04-4-B;** multi-range method. Can also analyze particulate phosphorus and orthophosphorus with this method. **Requires a standard heater and block digester for the digestion.**	
OP:	5 – 1000 **0.16-32.23**	0.7	µg P/L				
	0.25 – 10 **0.008-0.323**	0.013	mg P/L				
pP:	0.1-5.0	0.015	mg P/L				

Reducing Sugars

26-201-00-1 B^{R}	10-500	2.0	mg glucose/L	Tobacco Extracts	Ferricyanide method, 420 nm. **Requires a standard heater**.	18-May-10

Silicate

10-114-27-1-A ^{R}#	0.2 – 20	0.04	mg SiO_2/L	Waters	Molybdate reactive method; 820 nm. ANSA reduction NPDES Accepted . Omnion 3 / 4 support added 22 March 2016.	13-Sep-00
10-114-27-1-B^{R} ^	5 – 100	0.58	µg SiO_2/L	Waters	Molybdate reactive method; Stannous chloride reductant. 820 nm. **Plastic sample and standard vials and standard heater required.** Ultra-High Throughput method (>120 samples/hr); NPDES Equivalent; follows Standard Methods (4500-SiO2-C)	30-Oct-07
10-114-27-1-C^{R}	2.5 – 100	0.61	µg SiO_2/L	Waters	Molybdate reactive method; Stannous chloride reductant. 820 nm. **Plastic sample and standard vials and standard heater required. 2cm detector method; QC8500 only**; NPDES Equivalent; follows Standard Methods (4500-SiO2-C)	17-Feb-09
31-114-27-1-A^{R}^	1,202-6,009 **20 – 100**	**0.2**	µg SiO_2/L **µM SiO_2/L**	Brackish / Seawaters	Molybdate reactive method; Stannous chloride reductant. 820 nm. **Requires a standard heater.** NPDES Equivalent (USGS I-2700-85)	17-Sep-03

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
31-114-27-1-B^{R}^	75.0-300.45 **1.25 – 5.0**	**0.01**	µg SiO_2/L **µM SiO_2/L**	Brackish/ Seawaters	Molybdate reactive method; Stannous chloride reductant. 820 nm. **Requires a standard heater and plastic sample vials.** NPDES Equivalent (USGS I-2700-85)	17-Sep-03
31-114-27-1-D^{R}^	10 – 1700 21.39 – 3637.14	2.1 4.5	µg Si/L **µg SiO_2/L**	Brackish/ Seawaters	Molybdate reactive method; Stannous chloride reductant. 820 nm. **Requires a standard heater.** NPDES Equivalent (USGS I-2700-85)	24-Aug-18
31-114-27-1-E^{R}^	2.5 – 100 **0.042-1.66**	0.606	µg SiO_2/L **µM SiO_2/L**	Brackish / Seawaters	Molybdate reactive method; 820 nm, **2cm detector method; QC8500 only; Requires a standard heater and plastic sample and standard vials.** NPDES Equivalent (USGS I-2700-85)	28-Feb-08
31-114-27-1-F^{R}^	0.5 – 30 **0.0083-0.499**	0.05 **0.00083**	mg SiO_2/L **mM SiO_2/L**	Brackish / Seawaters	Molybdate reactive method; Stannous chloride reductant 820 nm, NPDES Equivalent. (USGS I-2700-85). **Requires a standard heater**.	23-Oct-08
31-114-27-2-A^{R}	60.09-6009 **1-100**	0.6 **0.1**	µg SiO_2/L **µM SiO_2/L**	Brackish / Seawaters	Molybdate reactive method; **Ascorbic acid** reductant. 820 nm. NPDES Equivalent (366.0) **Requires a standard heater and plastic sample and standard vials**.	23-Nov-10

Sulfate

See also IC section

10-116-10-1-A^{R}	3.0 – 300	0.95	mg SO_4^{2-}/L	Waters	Turbidimetric method; 420 nm.	28-Aug-03
10-116-10-1-C^{R}	0.5 – 10.0	0.2	mg SO_4^{2-}/L	Waters	Turbidimetric method; 420 nm	28-Aug-03
10-116-10-1-G^{R}	50 – 2000		mg SO_4^{2-}/L	Waters	Turbidimetric method; low-flow method; 420 nm.	17-May-08
10-116-10-2-A^{R} ^	5.0 – 100	1.8	mg SO_4^{2-}/L	Waters	Methylthymol blue method; 460 nm. NPDES Equivalent (375.2); follows Standard Methods (4500-SO4-G)	28-Aug-03
10-116-10-2-B^{R}#^	50 – 300	7.2	mg SO_4^{2-}/L	Waters	Methylthymol blue method; 460 nm. NPDES Equivalent. Omnion 4 Support added June 2015	28-Aug-03
10-116-10-2-E^{R}^	2 – 40 5- 100 50-300	0.36 1.22 10.0	mg SO_4^{2-}/L	Waters	Methylthymol blue method; 460 nm. NPDES Equivalent (375.2). **Multi range method**. Omnion 3 or higher support. June 2015	22-Jun-15
10-116-10-2-F^{R}^	20-300	4.0	mg SO_4^{2-}/L	Waters	Methylthymol blue method; 460 nm. NPDES Equivalent (375.2). Omnion 3 or higher support.	11-Mar-16

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-116-10-3-A^{R}^	10 – 300	3.0	mg SO_4^{2-}/L	Waters	Turbidimetric method; 420 nm. based on ASTM method. NPDES Equivalent. 90 injections per hour.	18-Mar-10
12-116-10-1-D^{R}	1 – 20	0.67	mg SO_4^{2-}/L	Soil extracts	Turbidimetric method; 420 nm. determination in 8M monobasic calcium phosphate soil extracts.	16-Sep-03

Sulfide

10-116-29-1-A^{R}	0.02 – 2.0	0.005	mg S/L	Waters	Methylene blue method; 660 nm. MicroDIST® method; 0.25 M NaOH final matrix **Requires a MicroDist block and tubes and standard heater.** Distillation required; follows Standard Methods (4500-S-I)	24-May-08
10-116-29-1-D^{R}	0.01-1.0	0.001	mg S/L	Waters	Methylene blue method. 660 nm. Samples preserved with NaOH (0.025M) and zinc acetate. **No distillation. Requires a standard heater**.	1-Dec-10
10-116-29-1-X^{R}	0.02 – 2.00 1 – 100	0.005 0.023	mg S/L	Waters	Methylene blue method; 660 nm. MicroDIST® method; multi-range method **Requires a MicroDist block and tubes and standard heater if** Distillation required (Must have final matrix of 0.25M NaOH)	23-Mar-10
10-116-29-3-A^{R} 10-116-29-3A51^{R} 10-116-29-3A52^{R}	0.01 – 2.0	0.006	mg S/L	Waters	In line distillation method; 660 nm. **Requires two dedicated channels with one standard and one non-standard heater**; samples w/ particulates not suitable manifold only Dedicated channels; QC8500 115V Dedicated channels; QC8500 220V	4-Oct-07
10-116-29-3B52^{R}	1.0 – 10.0	0.2	mg S/L	Waters	In line distillation method; 660 nm. requires two dedicated channels; **Requires two dedicated channels with one standard and one non-standard heater** samples w/ particulates not suitable; Dedicated channels; QC8500 220V	5-Jul-07

Sulfite

10-116-11-1-A^{R}	0.25 – 2.0	0.03	mg SO_3^{2-}/L	Waters	Pararosanaline method; 560 nm. Ultra-High Throughput method. **Requires a standard heater.**	4-Apr-08

	Method No	Range	MDL	Units	Matrix	Comments	Rev Date
21-116-11-2-D[R]	0.5 – 30.0 25 -300.0	0.15 1.5	mg SO_3^{2-}/L mg SO_3^{2-}/L	Beer,Wine	Pararosanaline method; 560 nm **Requires a standard heater**		06-Oct-16
21-116-11-2-E[R]	0.5-20.0	0.05	mg SO_3^{2-}/L	Beverages	Pararosanaline method 560 nm. Determination in coconut water. **Requires a standard heater.**		30-Jan-15

Surfactants (MBAS)

10-306-00-1-C[R]	0.025 – 2.0 0.010 – 1.0	0.004 0.0056	mg/L as LAS mg/L as SDS	Waters	Methylene blue method; 650 nm. dual extraction method. SDS or LAS. Glass calibration and standard vials must be used.	19-Dec-08
10-306-00-1-D[R]^	0.010 – 1.0	0.0024	mg SDS/L	Waters	Methylene blue method; 650 nm.single extraction method; NPDES Equivalent; follows Standard Methods (5540-C). SDS. Glass calibration and standard vials must be used.	25-Mar-08
10-306-00-1-E[R]	0.1 – 20.0	0.05	mg SDS/L	Waters	Methylene blue method; 650 nm. dual extraction method (SDS only) Glass calibration and standards vials must be used.	29-Sep-05
10-306-00-1-F	0.06-2.4	0.009	mg LAS/L	Waters	Methylene blue method; 650 nm. dual extraction method (LAS only) Glass calibration and standards vials must be used. SM5540C/ASTM2330-02	9-Apr-14

Uranium

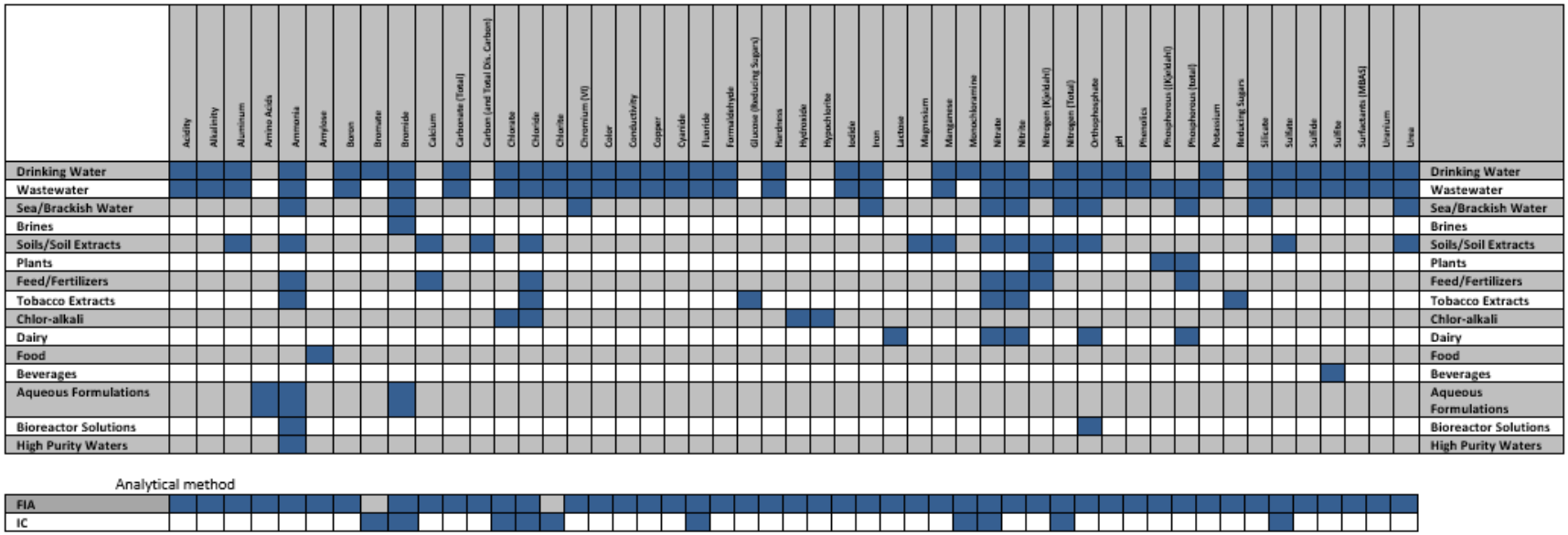
10-125-00-1-A[R]	0.3-50	0.03	mg U_3O_8	Waters	2-(5-bromo-2pyridylazo)-5-diethylaminophenol (Br-PADAP). 580 nm. 50 samples per hour	18-Sept-03

Urea

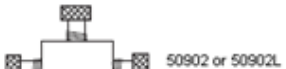
10-206-00-1-B[R]	15 – 500	3.3	µg N/L as Urea	Waters	Diacetyl monoxime/thiosemicarbazide. 530 nm. **Cannot be run simultaneously w/ other methods** as uses 0.84 M NaCl wash solution. **Requires non-standard heater and 60 position sample racks**.	15-Apr-08
12-206-00-1-A[R]	0.1-20	0.027	mg N/L as Urea	Soil Extracts	Diacetyl monoxime/thiosemicarbazide. 530 nm. 2M KCl /5 mg PMA extracts of soil. **Requires non-standard heater**	15-Mar-13

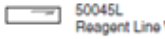
Method No	Range	MDL	Units	Matrix	Comments	Rev Date
31-206-00-1-A[R]	10 – 400 **0.714-28.57**	2.9	µg N/L as Urea **µM N/L as Urea**	Brackish / Seawaters	Diacetyl monoxime/thiosemicarbazide method. 530 nm. **Requires non-standard heater and 60 position sample racks**.	16-Sep-03
31-206-00-1-B[R]	0.025 – 5.00 **1.79-357.14**	0.004	mg N/L as Urea **µM N/L as Urea**	Brackish / Seawaters	Multi-range method. Diacetyl monoxime/thiosemicarbazide. 530 nm. **Requires non-standard heater and 60 position sample racks**.	7-Dec-07
	0.2 – 20 **0.0143-1.429**	0.026	mg N/L **mM N/L as Urea**			

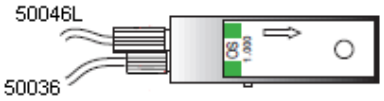
Method Matrix



Selected Parts. Please note this is NOT a complete listing








50237A Cadmium Column


50254 Cadmium Column Maintainence kit

50065 Flow cell flare, 13 cm
50067 Flow cell flare, 35 cm
31933 Flow cell, 10mm

Nipples

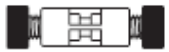
50015 Large
50015A Small
50014L Reducing
50019 Stainless Steel

Interference Filters
89### ### indicates the wavelength

24927 Switching Valve
50962 Flare Kit for Nitrate
50963 Flare Kit for Sulfate
24012 Connector, Amber
24015 Washer

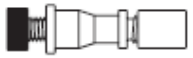
Union Fitting


50913


50901

Small Pump Tube Adapter


50906


85287 for QC8500

Large Pump Tube Adapter


85293 for QC8500


50907

PumpTube Adapter

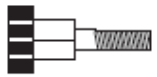

50905


85269 for QC8500

50009
Tube Connector, Amber

31077 for QC8000 Valve
Valve Connector, White

85245
One-piece fitting
for QC8500 valve



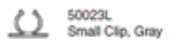
28051L
Rheodyne Nut & Ferrule

28058 Rheodyne Ferrule

28057
Upchurch Nut & Ferrule


50013
O-ring, Viton


50024L
Large Clip, Gray


50023L
Small Clip, Gray

50913 Teflon
Union Fitting

(ultem nuts)


50007 or 85258 for QC8500
Large Collar, Black

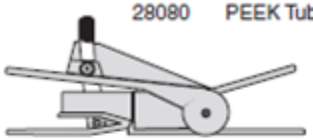

50006 or 85257 for QC8500
Small Collar, White


50060
O-ring Probe


50100L
Degassing Tube


50031
Scalpel

28081
Blades for PEEK Tubing Cutter



28080 PEEK Tubing Cutter

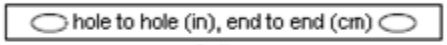
50021
Transmission Tubing, PVC, 0.030" ID

50029
Transmission Tubing, PVC, 0.060" ID

Teflon Tubing

50927 Manifold, 0.022" ID, Green
50928 Manifold, 0.032" ID
41300L Tefzel Tubing, 0.040" ID x 0.060" OD
30928 Zeus Tubing, 0.032" ID

50091 Microloop Tubing, Teflon, 16 cm
50092 Microloop Tubing, Teflon, 12.5 cm



Coils

Size	Coil Support Only	Wrapped, Teflon 0.022" ID	Wrapped, Teflon 0.032" ID
1" or 4.5 cm	50016L	50981	50916
2" or 7cm	50018L	50982	50918
2.5" or 8 cm	50017	50983	50917
4" or 12cm	50020	50984	50920
8" or 22 cm	50022L	N/A	50922

Alternating Coils 12 cm

Coil Support Only	Wrapped, Teflon 0.022" ID	Wrapped, Teflon 0.032" ID
50039	50985	50921

Pump Tubing

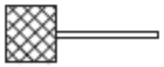
534XX PVC
544XX Duraprene
494XX Silicone
654XX Acidflex

XX is the number that specifies the pump tube color:

05 Orange-Yellow, 0.020" ID
06 Orange-White, 0.025" ID
07 Black-Black, 0.030" ID
08 Orange-Orange, 0.035" ID
09 White-White, 0.040" ID
10 Red-Red, 0.045" ID
11 Gray-Gray, 0.051" ID
12 Yellow-Yellow, 0.056" ID
13 Blue-Blue, 0.065" ID
14 Green-Green, 0.073" ID
15 Purple-Purple, 0.081" ID
16 Purple-Black, 0.090" ID
17 Purple-Orange, 0.100" ID
18 Purple-White, 0.110" ID
19 Yellow-Blue, 0.060" ID

Bottles

28193L Glass Bottle, 1000 mL
35102 Glass Bottle, 2000 mL
43915 Glass Bottle, 100 mL (includes cap)



50012
O-ring Remover

50062
Drill Bit

28101L
End Plug

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LL022 Rev. 17 17th February, 2021