

ANALYTE	METHOD DESCRIPTION	METHOD NUMBER	MDL (Lowest Range)	RANGES	REFERENCES
AMMONIA	Berthelot reaction – phenol with sodium hypochlorite to form indophenol blue and measured at 630 nm	A-025-18	With dialyzer: 0.02 mg N/L Without dialyzer: 2.0 µg N/L	With dialyzer: 0.0 – 6.0 mg N/L 0.0 – 25 mg N/L Without dialyzer: 0.0 – 0.5 mg N/L 0.0 – 2.5 mg N/L	Std Methods 4500-NH ₃ G, H USGS 1-4523-85 US EPA 350.1 Rev 2.0
AMMONIA	Berthelot reaction – salicylate with DCI to form indophenol blue and measured at 660 nm.	A-041-19	With dialyzer: 0.013 mg N/L Without dialyzer: 7.0 µg N/L	With dialyzer: 0.0 – 6.4 mg N/L 0.0 – 25 mg N/L Without dialyzer: 0.0 – 0.8 mg N/L 0.0 – 3.0 mg N/L	Std Methods 4500-NH ₃ G, H USGS 1-4523-85 US EPA 350.1 Rev 2.0
AMMONIA (2 M KCl Extracts or 0.01 M CaCl ₂)	Berthelot reaction – salicylate with DCI to form indophenol blue and measured at 660 nm.	A-048-19	With 2 M KCl: 0.024 mg N/L With 0.01 M CaCl₂: 0.006 mg N/L	With 2 M KCl: 0.0 – 3.0 mg N/L 0.0 – 25 mg N/L Without 0.01 M CaCl₂: 0.0 – 3.0 mg N/L 0.0 – 25 mg N/L	
CALCIUM	Reaction with cresolphthalein complexone in an alkaline medium and measured at 570 nm.	A-083-20	With dialyzer: 0.18 mg/L	With dialyzer: 0.0 – 15.0 mg/L 0.0 – 100 mg/L	
CHLORIDE	Mercuric thiocyanate reaction in the presence of ferric nitrate and measured at 480 nm	A-085-20	With dialyzer: 0.248 mg Cl/L Without dialyzer: 0.055 mg Cl/L	With dialyzer: 0.0 – 300 mg Cl/L 0.0 – 700 mg Cl/L Without dialyzer: 0.0 – 10 mg Cl/L 0.0 – 25 mg Cl/L	Std. Methods 4500-Cl- E (18th,19th,20th)
HARDNESS	Calmagite indicator reaction measured at 520 nm.	A-084-20	With dialyzer: 0.20 mg/L	With dialyzer: 0.0 - 400 mg/L	EPA 130.1 (1971)
NITRATE/NITRITE	Reduction by hydrazine followed by sulfanilamide reaction in the presence of N-(1-naphthylethylenediamine) dihydrochloride measured at 540 nm.	A-026-19	With dialyzer: 0.003 mg N/L Without dialyzer: 0.55 µg N/L	With dialyzer: 0.0 – 2.8 mg N/L 0.0 – 12 mg N/L Without dialyzer: 0.0 – 240 µg N/L 0.0 – 1.0 mg N/L	EPA 353.1(1978) Std. Methods 4500-NO ₃ -H (18th, 19th, 20th)

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NITRATE/NITRITE	Cadmium coil reduction followed by sulfanilamide reaction in the presence of N-(1-naphthylethylenediamine) dihydrochloride measured at 540 nm.	A-028-19	With dialyzer: 0.002 mg N/L Without dialyzer: 0.5 µg N/L	With dialyzer: 0.0 – 2.0 mg N/L 0.0 – 10 mg N/L Without dialyzer: 0.0 – 0.2 mg N/L 0.0 – 0.6 mg N/L	EPA 353.2, version 2 (1993) Std. Methods 4500-NO ₃ F (18th, 19th, 20th)
NITRATE/NITRITE (2M KCl)	Cadmium coil reduction followed by sulfanilamide reaction in the presence of N-(1-naphthylethylenediamine) dihydrochloride measured at 540 nm.	A-049-19	With dialyzer: 0.002 mg N/L Without dialyzer: 0.5 µg N/L	With dialyzer: 0.0 – 2.0 mg N/L 0.0 – 10 mg N/L Without dialyzer: 0.0 – 0.2 mg N/L 0.0 – 0.6 mg N/L	
NITRATE/NITRITE (2M KCl or 0.01 M CaCl ₂)	Reduction by hydrazine followed by sulfanilamide reaction in the presence of N-(1-naphthylethylenediamine) dihydrochloride measured at 540 nm.	A-026-19	With 2 M KCl: 0.003 mg N/L With 0.01 M CaCl₂: 0.004 mg N/L	With 2 M KCl: 0.0 – 1.0 mg N/L 0.0 – 10 mg N/L With 0.01 M CaCl₂: 0.0 – 1.0 mg N/L 0.0 – 10 mg N/L	
NITRITE	Reaction with sulfanilamide and NEDD to form a reddish-purple azo dye measured at 540 nm.	A-047-19	With dialyzer: 1.5 µg N/L Without dialyzer: 0.8 µg N/L	With dialyzer: 0.0 – 2.0 mg N/L 0.0 – 8 mg N/L Without dialyzer: 0.0 – 0.2 mg N/L 0.0 – 0.8 mg N/L	EPA 353.2, version 2 (1993) Std. Methods 4500-NO ₃ F (18th, 19th, 20th)
NITROGEN, Total Kjeldahl	Kjeldahl digests are reacted with alkaline salicylate in the presence of hypochlorite and sodium nitroferricyanide and measured at 660 nm. (Manual digestion required)	A-066-20	With dialyzer: 0.004 mg N/L Without dialyzer: 0.001 mg N/L	With dialyzer: 0.0 – 8 mg N/L 0.0 – 25 mg N/L Without dialyzer: 0.0 – 0.8 mg N/L 0.0 – 2.5 mg N/L	EPA 351.2, version 2 (1993)
PHOSPHATE, ortho	Acidic molybdate/antimony with ascorbic acid reduction (phosphomolybdenum blue) and measured at 660 nm.	A-029-18	With dialyzer: 0.02 mg P/L Without dialyzer: 0.002 mg P/L	With dialyzer: 0.0 – 8.0 mg P/L 0.0 – 50 mg P/L Without dialyzer: 0.0 – 1.0 mg P/L 0.0 – 10 mg P/L	EPA 365.1, version 2 (1993) Std. Methods 4500-P F (18th, 19th, 20th)

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PHOSPHORUS, Total Kjeldahl	Kjeldahl digests are reacted with acidic molybdate/antimony with ascorbic acid reduction and measured at 660 nm.	A-067-20	With dialyzer: 0.046 mg P/L Without dialyzer: 0.003 mg P/L	With dialyzer: 0.0 – 8.0 mg P/L 0.0 – 50 mg P/L Without dialyzer: 0.0 – 1.7 mg P/L 0.0 – 6.0 mg P/L	EPA 365.4 (1983)

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AMMONIA	Berthelot reaction – phenol with sodium hypochlorite to form indophenol blue and measured at 630 nm	A-032-19	0.002 mg N/L	0.0 – 0.5 mg N/L 0.0 – 5.0 mg N/L	Std Methods 4500-NH ₃ G, H USGS 1-4523-85 US EPA 350.1 Rev 2.0
NITRATE/NITRITE	Cadmium coil reduction followed by sulfanilamide reaction in the presence of N-(1-naphthylethylenediamine) dihydrochloride measured at 540 nm.	A-034-19	0.0009 mg N/L	0.0 – 0.2 mg N/L 0.0 – 2.0 mg N/L	EPA 353.2, version 2 (1993) Std. Methods 4500-NO ₃ F (18th, 19th, 20th)
PHOSPHATE, ortho	Acidic molybdate/antimony with ascorbic acid reduction (phosphomolybdenum blue) and measured at 660 nm or 880 nm.	A-036-19	3.0 µg/L	0.0 – 1.0 mg P/L 0.0 – 5.0 mg P/L	EPA 365.1, version 2 (1993) Std. Methods 4500-P F (18th, 19th, 20th)

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NITRITE	Reaction with sulfanilamide and NEDD to form a reddish-purple azo dye measured at 540 nm.	A-003-18	Water: 0.003 µmol/L Seawater 0.002 µmol/L	Water: 0.0 – 0.5 µmol/L 0.0 – 30 µmol/L Seawater 0.0 – 0.5 µmol/L 0.0 – 30 µmol/L	EPA 353.2, version 2 (1993) Std. Methods 4500-NO ₃ F (18th, 19th, 20th)
PHOSPHATE, ortho	Acidic molybdate/antimony with ascorbic acid reduction (phosphomolybdenum blue) and measured at 880 nm.	A-004-18	Water: 0.005 µmol/L Seawater 0.004 µmol/L	Water: 0.0 – 1.0 µmol/L 0.0 – 36 µmol/L Seawater 0.0 – 1.0 µmol/L 0.0 – 4.0 µmol/L	EPA 365.1, version 2 (1993) Std. Methods 4500-P F (18th, 19th, 20th)
PHOSPHATE, ortho	Acidic molybdate/antimony with ascorbic acid reduction (phosphomolybdenum blue) and measured at 660 nm or 880 nm.	A-021-19	0.3 µg P/L	0.0 – 100 µg P/L 0.0 – 1000 µg P/L	DIN EN ISO 15681-2:2019-05
PHOSPHATE, total	Acidic molybdate/antimony with ascorbic acid reduction (phosphomolybdenum blue) and measured at 880 nm. (Manual persulfate digestion required)	A-064-20	0.002 mg P/L	0.0 – 0.5 mg P/L 0.0 – 5.0 mg P/L	EPA 365.1 version 2 (1993) Std. Methods 4500-P B, F (18 th , 19 th , 20 th)

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AMMONIA	Berthelot reaction – phenol with sodium hypochlorite to form indophenol blue and measured at 630 nm	A-001-19	Water: 0.017 µmol/L Seawater 0.05 µmol/L	Water: 0.0 – 8.0 µmol/L 0.0 – 100 µmol/L Seawater 0.0 – 8.0 µmol/L 0.0 – 100 µmol/L	Std Methods 4500-NH ₃ G, H USGS 1-4523-85 US EPA 350.1 Rev 2.0
AMMONIA	Berthelot reaction – salicylate with DCI to form indophenol blue and measured at 660 nm.	A-043-19	Water: 0.017 µmol/L Seawater 0.05 µmol/L	Water: 0.0 – 8.0 µmol/L 0.0 – 86 µmol/L Seawater 0.0 – 8.0 µmol/L 0.0 – 80 µmol/L	Std Methods 4500-NH ₃ G, H USGS 1-4523-85 US EPA 350.1 Rev 2.0
NITRATE/NITRITE	Cadmium coil reduction followed by sulfanilamide reaction in the presence of N-(1-naphthylethylenediamine) dihydrochloride measured at 540 nm.	A-044-19	0.006 µmol/L	0.0 – 3.6 µmol/L 0.0 – 50 µmol/L	EPA 353.2, version 2 (1993) Std. Methods 4500-NO ₃ F (18 th , 19 th , 20 th)
PHOSPHATE, ortho	Acidic molybdate/antimony with ascorbic acid reduction (phosphomolybdenum blue) and measured at 880 nm.	A-005-19	Water: 0.012 µmol/L Seawater 0.014 µmol/L	Water: 0.0 – 2.0 µmol/L 0.0 – 64.5 µmol/L Seawater 0.0 – 2.0 µmol/L 0.0 – 40 µmol/L	EPA 365.1, version 2 (1993) Std. Methods 4500-P F (18 th , 19 th , 20 th)
PHOSPHATE, total	Acidic molybdate/antimony with ascorbic acid reduction (phosphomolybdenum blue) and measured at 880 nm. (Manual persulfate digestion required)	USA-002-20	0.3 µg P/L	0.0 – 1.0 mg P/L	EPA 365.1 version 2 (1993) Std. Methods 4500-P B, F (18 th , 19 th , 20 th)
SILICATE	Reduction of silico-molybdate in acidic solution to molybdenum blue by ascorbic acid. Oxalic acid is added to minimize interference from phosphate and measured at 820 nm.	A-006-19	0.014 µmol/L	0.0 – 8.0 µmol/L 0.0 – 1.0 mmol/L	EPA 365.4 (1983)

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TOTAL ALKALOIDS (as nicotine)	An aqueous extract of tobacco is prepared and reaction with sulanilic acid and cyanogen chloride and measured colorimetrically at 460 nm.	A-070-20	0.7 mg/L	0.0 – 400 mg/L 0 – 1600 mg/L	Coresta method #35 ISO 15152
CHLORIDE	Mercuric thiocyanate reaction in the presence of ferric nitrate measured colorimetrically at 480 nm.	A-071-20	0.442 mg/L	0.0 – 100 mg/L 0.0 – 1000 mg/L	Std. Methods 4500-Cl ⁻ E (18 th , 19 th , 20 th)

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<p style="text-align: center;">NITROGEN, Total dissolved</p>	<p>Automated in-line UV persulfate digestion with cadmium column reduction followed by sulfanilamide reaction in the presence of N-(1-naphthylethylenediamine) dihydrochloride measured at 540 nm. (Seawater)</p>	A-008-19	0.043 µmol/L	0.0 – 10 µmol/L 0.0 – 40 µmol/L	
<p style="text-align: center;">PHOSPHORUS, Total dissolved</p>	<p>Automated in-line UV persulfate digestion followed by acidic molybdate/antimony with ascorbic acid reduction (phosphomolybdenum blue) and measured at 880 nm. (Seawater)</p>	A-009-19	0.037 µmol/L	0.0 – 5.0 µmol/L 0.0 – 50 µmol/L	

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<p style="text-align: center;">UREA (Fertilizer)</p>	<p>Reaction with diemthylaminobenzaldehyde under acidic conditions measured photometrically at 440 nm.</p>	<p style="text-align: center;">A-054-19</p>	<p style="text-align: center;">0.232 mg N/L</p>	<p style="text-align: center;">0.0 – 125 mg N/L 0.0 – 1000 mg N/L</p>	
<p style="text-align: center;">CYANIDE</p>	<p>Cyanides are converted to cyanogen chloride by reaction with chloramine-T followed by reaction with pyridine and barbituric acid measure colorimetrically at 570 nm. (UV Digestor, Distillation)</p>	<p style="text-align: center;">US-001-20</p>	<p style="text-align: center;">1.4 µg CN/L</p>	<p style="text-align: center;">0.0 – 80 µg CN/L 0.0 – 500 µg CN/L</p>	

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