

VELAP 40 CFR 136.3 (Table 1B) Fixed Limits Table

Applicable to testing done by Standard Methods used for VA-DEQ/DMME compliance when methods specify performance-based limits

Line #	Parameter ¹	Methodology ¹	EPA ¹	Approved Standard Methods ¹ (from Standard Methods for the Examination of Water and Wastewater)	Laboratory Fortified Blank (LFB) or Laboratory Control Sample; as Percent Recovery ^{2,3}	Laboratory Fortified Matrix (LFM) also called Matrix Spike (MS); as Percent Recovery ^{2,3}	Precision of Low Level Duplicates - <20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)	Precision of High Level Duplicates - >20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)
1	Acidity, as CaCO ₃	Electrometric endpoint or phenolphthalein endpoint		2310 B-97	80-120%R	Not Applicable	±25%	±10%
2	Alkalinity, as CaCO ₃	Electrometric or Colorimetric titration to pH 4.5, manual		2320 B-97	80-120%R	Not Applicable	±25%	±10%
3	Aluminum--Total	AA direct aspiration		3111 D-99 or E-99	80-120%R	80-120%R	±25%	±10%
4	Aluminum--Total	AA furnace		3113 B-04	80-120%R	80-120%R	±25%	±10%
5	Aluminum--Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
6	Aluminum--Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
7	Aluminum--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
8	Aluminum--Total	Colorimetric (Eriochrome cyanine R)		3500-AI B-01	80-120%R	80-120%R	±25%	±10%
9	Ammonia (as N)	Titration		4500-NH ₃ C-97	80-120%R	80-120%R	±25%	±10%
10	Ammonia (as N)	Electrode		4500-NH ₃ D or E-97	80-120%R	80-120%R	±25%	±10%
11	Ammonia (as N)	Manual phenate, salicylate, or other substituted phenols in Berthelot reaction based methods		4500-NH ₃ F -97	80-120%R	80-120%R	±25%	±10%
12	Ammonia (as N)	Automated phenate, salicylate, or other substituted phenols in Berthelot reaction based methods	350.1 Rev. 2.0 (1993)	4500-NH ₃ G-97 or H-97	90-110%R [EPA]	90-110%R [EPA]	±25%	±10%
13	Antimony-Total	AA direct aspiration		3111 B-99	80-120%R	80-120%R	±25%	±10%
14	Antimony-Total	AA furnace		3113 B-04	80-120%R	80-120%R	±25%	±10%
15	Antimony-Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
16	Antimony-Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%

VELAP 40 CFR 136.3 (Table 1B) Fixed Limits Table

Applicable to testing done by Standard Methods used for VA-DEQ/DMME compliance when methods specify performance-based limits

Line #	Parameter ¹	Methodology ¹	EPA ¹	Approved Standard Methods ¹ (from Standard Methods for the Examination of Water and Wastewater)	Laboratory Fortified Blank (LFB) or Laboratory Control Sample; as Percent Recovery ^{2,3}	Laboratory Fortified Matrix (LFM) also called Matrix Spike (MS); as Percent Recovery ^{2,3}	Precision of Low Level Duplicates - <20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)	Precision of High Level Duplicates - >20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)
17	Antimony-Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
18	Arsenic-Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
19	Arsenic-Total	AA gaseous hydride		3114 B-09 or 3114 C-09	80-120%R	80-120%R	±25%	±10%
20	Arsenic-Total	AA furnace		3113 B -99	80-120%R	80-120%R	±25%	±10%
21	Arsenic-Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
22	Arsenic-Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	±25%	±10%
23	Arsenic-Total	Colorimetric (SDDC)		3500-As B-97	80-120%R	80-120%R	±25%	±10%
24	Barium--Total	AA direct aspiration		3111D-99	80-120%R	80-120%R	±25%	±10%
25	Barium--Total	AA furnace		3113 B-04	80-120%R	80-120%R	±25%	±10%
26	Barium--Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
27	Barium--Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
28	Barium--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
29	Beryllium--Total	AA direct aspiration		3111D-99 or E-99	80-120%R	80-120%R	±25%	±10%
30	Beryllium--Total	AA furnace		3113 B-04	80-120%R	80-120%R	±25%	±10%
31	Beryllium--Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
32	Beryllium--Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
33	Beryllium--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
34	Biochemical oxygen demand (BOD5)	Dissolved Oxygen Depletion		5210 B-01	Refer to Method	Refer to Method	±25%	±10%

VELAP 40 CFR 136.3 (Table 1B) Fixed Limits Table

Applicable to testing done by Standard Methods used for VA-DEQ/DMME compliance when methods specify performance-based limits

Line #	Parameter ¹	Methodology ¹	EPA ¹	Approved Standard Methods ¹ (from Standard Methods for the Examination of Water and Wastewater)	Laboratory Fortified Blank (LFB) or Laboratory Control Sample; as Percent Recovery ^{2,3}	Laboratory Fortified Matrix (LFM) also called Matrix Spike (MS); as Percent Recovery ^{2,3}	Precision of Low Level Duplicates - <20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)	Precision of High Level Duplicates - >20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)
35	Boron --Total	Colorimetric (curcumin)		4500-B B-00	80-120%R	80-120%R	±25%	±10%
36	Boron --Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
37	Boron --Total	ICP/AES, or	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
38	Boron --Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
39	Bromide	Ion chromatography	300.0, Rev. 2.1 (1993)	4110 B-00, C-00, D-00	90-110%R [EPA]	Until sufficient data available to develop internal limits, 80-120%R (Method A) [EPA]	±25%	±10%
40	Bromide	Ion chromatography	300.1, Rev. 1.0 (1997)	4110 B-00, C-00, D-00	MRL to 10x MRL: 75-125%; 10XMRL to highest calibration level: 85-115% [EPA]	75-125% [EPA]	MRL to 10xMRL ± 20 % [EPA]	10xMRL to highest calibration level ± 10 % [EPA]
41	Bromide	CIE/UV		4140 B-97	80-120%R	80-120%R	±25%	±10%
42	Cadmium--Total	AA direct aspiration		3111 B-99 or C-99	80-120%R	80-120%R	±25%	±10%
43	Cadmium--Total	AA furnace		3113 B-04	80-120%R	80-120%R	±25%	±10%
44	Cadmium--Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
45	Cadmium--Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
46	Cadmium--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
47	Cadmium--Total	Colorimetric (Dithizone)		3500 Cd D-90	80-120%R	80-120%R	±25%	±10%
48	Calcium--Total	AA direct aspiration		3111 B-99	80-120%R	80-120%R	±25%	±10%

VELAP 40 CFR 136.3 (Table 1B) Fixed Limits Table

Applicable to testing done by Standard Methods used for VA-DEQ/DMME compliance when methods specify performance-based limits

Line #	Parameter ¹	Methodology ¹	EPA ¹	Approved Standard Methods ¹ (from Standard Methods for the Examination of Water and Wastewater)	Laboratory Fortified Blank (LFB) or Laboratory Control Sample; as Percent Recovery ^{2,3}	Laboratory Fortified Matrix (LFM) also called Matrix Spike (MS); as Percent Recovery ^{2,3}	Precision of Low Level Duplicates - <20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)	Precision of High Level Duplicates - >20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)
49	Calcium--Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
50	Calcium--Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
51	Calcium--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
52	Calcium--Total	Titrimetric (EDTA)		3500-Ca B-97	80-120%R	80-120%R	±25%	±10%
53	Carbonaceous biochemical oxygen demand (CBOD5)	Dissolved Oxygen Depletion with nitrification inhibitor		5210 B-01	Refer to Method	Refer to Method	±25%	±10%
54	Chemical oxygen demand (COD)	Titrimetric	410.3 (Rev. 1978)	5220 B-97 or C-97	Limits not given in EPA method; 80-120%R	Limits not given in EPA method; 80-120%R	±25%	±10%
55	Chemical oxygen demand (COD)	Spectrophotometric, manual or automated	410.4 Rev. 2.0, (1993)	5220 D-97	90-110%R [EPA]	90-110%R [EPA]	±25%	±10%
56	Chloride	Titrimetric (silver nitrate) or		4500-Cl ⁻ B-97	80-120%R	80-120%R	±25%	±10%
57	Chloride	(Mercuric nitrate)		4500-Cl ⁻ C-97	80-120%R	80-120%R	±25%	±10%
58	Chloride	Automated (Ferricyanide)		4500-Cl ⁻ E-97	80-120%R	80-120%R	±25%	±10%
59	Chloride	Potentiometric Titration		4500-Cl ⁻ D-97	80-120%R	80-120%R	±25%	±10%
60	Chloride	Ion chromatography	300.0, Rev. 2.1 (1993)	4110 B-00 or C-00	90-110%R [EPA]	Until sufficient data available to develop internal limits, 80-120%R (Method A) [EPA]	±25%	±10%
61	Chloride	Ion chromatography	300.1, Rev. 1.0 (1997)	4110 B-00 or C-00	MRL to 10x MRL: 75-125%; 10xMRL to highest calibration level: 85-115% [EPA]	75-125% [EPA]	MRL to 10xMRL ± 20 % [EPA]	10xMRL to highest calibration level ± 10 % [EPA]

VELAP 40 CFR 136.3 (Table 1B) Fixed Limits Table

Applicable to testing done by Standard Methods used for VA-DEQ/DMME compliance when methods specify performance-based limits

Line #	Parameter ¹	Methodology ¹	EPA ¹	Approved Standard Methods ¹ (from Standard Methods for the Examination of Water and Wastewater)	Laboratory Fortified Blank (LFB) or Laboratory Control Sample; as Percent Recovery ^{2,3}	Laboratory Fortified Matrix (LFM) also called Matrix Spike (MS); as Percent Recovery ^{2,3}	Precision of Low Level Duplicates - <20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)	Precision of High Level Duplicates - >20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)
62	Chloride	CIE/UV		4140 B-97	80-120%R	80-120%R	±25%	±10%
63	Chlorine--Total residual	Amperometric direct		4500-CI D-00	80-120%R	Not Applicable	±25%	±10%
64	Chlorine--Total residual	Amperometric direct (low level)		4500-CI E-00	80-120%R	Not Applicable	±25%	±10%
65	Chlorine--Total residual	Iodometric direct		4500-CI B-00	80-120%R	Not Applicable	±25%	±10%
66	Chlorine--Total residual	Back titration either endpoint		4500-CI C-00	80-120%R	Not Applicable	±25%	±10%
67	Chlorine--Total residual	DPD-FAS		4500-CI F-00	80-120%R	Not Applicable	±25%	±10%
68	Chlorine--Total residual	Spectrophotometric, DPD		4500-CI G-00	80-120%R	Not Applicable	±25%	±10%
69	Chlorine, Free available	Amperometric direct		4500-CI D-00	80-120%R	Not Applicable	±25%	±10%
70	Chlorine, Free available	Amperometric direct (low level)		4500-CI E-00	80-120%R	Not Applicable	±25%	±10%
71	Chlorine, Free available	DPD-FAS		4500-CI F-00	80-120%R	Not Applicable	±25%	±10%
72	Chlorine, Free available	Spectrophotometric, DPD		4500-CI G-00	80-120%R	Not Applicable	±25%	±10%
73	Chromium VI dissolved	AA chelation-extraction		3111 C-99	80-120%R	80-120%R	±25%	±10%
74	Chromium VI dissolved	Ion chromatography	218.6, Rev 3.3 (1994)	3500-Cr C-09	Refer to Method	Refer to Method	±25%	±10%
75	Chromium VI dissolved	Colorimetric (Diphenylcarbazide)		3500-Cr B-09	Refer to Method	Refer to Method	±25%	±10%
76	Chromium--Total	AA direct aspiration		3111 B-99	80-120%R	80-120%R	±25%	±10%
77	Chromium--Total	AA chelation-extraction		3111 C-99	80-120%R	80-120%R	±25%	±10%
78	Chromium--Total	AA furnace		3113 B-99	80-120%R	80-120%R	±25%	±10%
79	Chromium--Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%

VELAP 40 CFR 136.3 (Table 1B) Fixed Limits Table

Applicable to testing done by Standard Methods used for VA-DEQ/DMME compliance when methods specify performance-based limits

Line #	Parameter ¹	Methodology ¹	EPA ¹	Approved Standard Methods ¹ (from Standard Methods for the Examination of Water and Wastewater)	Laboratory Fortified Blank (LFB) or Laboratory Control Sample; as Percent Recovery ^{2,3}	Laboratory Fortified Matrix (LFM) also called Matrix Spike (MS); as Percent Recovery ^{2,3}	Precision of Low Level Duplicates - <20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)	Precision of High Level Duplicates - >20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)
80	Chromium--Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
81	Chromium--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
82	Chromium--Total	Colorimetric (Diphenylcarbazide)		3500-Cr B-09	Refer to Method	Refer to Method	±25%	±10%
83	Cobalt--Total	AA direct aspiration		3111B-99 or C-99	80-120%R	80-120%R	±25%	±10%
84	Cobalt--Total	AA furnace		3113 B-04	80-120%R	80-120%R	±25%	±10%
85	Cobalt--Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
86	Cobalt--Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
87	Cobalt--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
88	Color platinum cobalt units or dominant wavelength, hue, luminance purity:	Spectrophotometric (Platinum cobalt)		2120 B-01	Not Applicable	Not Applicable	±25%	±10%
89	Copper--Total	AA direct aspiration		3111B-99 or C-99	80-120%R	80-120%R	±25%	±10%
90	Copper--Total	AA furnace		3113 B-04	80-120%R	80-120%R	±25%	±10%
91	Copper--Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
92	Copper--Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
93	Copper--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
94	Copper--Total	Colorimetric (Neocuproine)		3500-Cu B-99	80-120%R	80-120%R	±25%	±10%
95	Copper--Total	(Bathocuproine)		3500-Cu C-99	80-120%R	80-120%R	±25%	±10%
96	Cyanide--Total	Manual distillation with MgCl ₂ followed by any of the following	335.4, Rev. 1.0 (1993)	4500-CN B-99 or C-99	90-110%R [EPA]	90-110%R [EPA]	±25%	±10%
97	Cyanide--Total	Titrimetric		4500-CN D-99	80-120%R	80-120%R	±25%	±10%
98	Cyanide--Total	Spectrophotometric, manual		4500-CN E-99	80-120%R	80-120%R	±25%	±10%

VELAP 40 CFR 136.3 (Table 1B) Fixed Limits Table

Applicable to testing done by Standard Methods used for VA-DEQ/DMME compliance when methods specify performance-based limits

Line #	Parameter ¹	Methodology ¹	EPA ¹	Approved Standard Methods ¹ (from Standard Methods for the Examination of Water and Wastewater)	Laboratory Fortified Blank (LFB) or Laboratory Control Sample; as Percent Recovery ^{2,3}	Laboratory Fortified Matrix (LFM) also called Matrix Spike (MS); as Percent Recovery ^{2,3}	Precision of Low Level Duplicates - <20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)	Precision of High Level Duplicates - >20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)
99	Cyanide--Total	Ion Selective Electrode		4500-CN F-99	80-120%R	80-120%R	±25%	±10%
100	Cyanide, Available mg/L	Cyanide Amenable to Chlorination (CATC); Manual distillation with MgCl ₂ followed by titrimetric or spectrophotometric		4500-CN G-99	80-120%R	80-120%R	±25%	±10%
101	Fluoride--Total	Manual distillation followed by any of the following		4500-F B-97	80-120%R	80-120%R	±25%	±10%
102	Fluoride--Total	Electrode, manual		4500-F C-97	80-120%R	80-120%R	±25%	±10%
103	Fluoride--Total	Colorimetric (SPADNS)		4500-F D-97	80-120%R	80-120%R	±25%	±10%
104	Fluoride--Total	Automated complexone		4500-F E-97	80-120%R	80-120%R	±25%	±10%
105	Fluoride--Total	Ion chromatography	300.0, Rev. 2.1 (1993)	4110 B-00 or C-00	90-110%R [EPA]	Until sufficient data available to develop internal limits, 80-120%R (Method A) [EPA]	±25%	±10%
106	Fluoride--Total	Ion chromatography	300.1, Rev. 1.0 (1997)	4110 B-00 or C-00	MRL to 10x MRL: 75-125%; 10XMRL to highest calibration level: 85-115% [EPA]	75-125% [EPA]	MRL to 10xMRL ± 20 % [EPA]	10xMRL to highest calibration level ± 10 % [EPA]
107	Fluoride--Total	CIE/UV		4140 B-97	80-120%R	80-120%R	±25%	±10%
108	Gold--Total	AA direct aspiration		3111B-99	80-120%R	80-120%R	±25%	±10%
109	Gold--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
110	Gold--Total	AA furnace	231.2 (Issued 1978)	3113 B-04	Limits not given in EPA method; 80-120%R	Limits not given in EPA method; 80-120%R	±25%	±10%
111	Hardness--Total, as CaCO₃	Titrimetric (EDTA)		2340 C-97	80-120%R	Not Applicable	±25%	±10%
112	Hardness--Total, as CaCO₃	Ca plus Mg as their carbonates, by inductively coupled plasma or AA direct aspiration.		2340 B-97	80-120%R	Not Applicable	±25%	±10%

VELAP 40 CFR 136.3 (Table 1B) Fixed Limits Table

Applicable to testing done by Standard Methods used for VA-DEQ/DMME compliance when methods specify performance-based limits

Line #	Parameter ¹	Methodology ¹	EPA ¹	Approved Standard Methods ¹ (from Standard Methods for the Examination of Water and Wastewater)	Laboratory Fortified Blank (LFB) or Laboratory Control Sample; as Percent Recovery ^{2,3}	Laboratory Fortified Matrix (LFM) also called Matrix Spike (MS); as Percent Recovery ^{2,3}	Precision of Low Level Duplicates - <20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)	Precision of High Level Duplicates - >20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)
113	Hydrogen ion (pH), pH units	Electrometric measurement		4500-H ⁺ B-00	Refer to Method (Table 4020:1)	Not Applicable	±20% or Refer to Method	
114	Iridium--Total	AA direct aspiration		3111 B-99	80-120%R	80-120%R	±25%	±10%
115	Iridium--Total	ICP/MS		3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
116	Iron--Total	AA direct aspiration		3111 B-99 or C-99	80-120%R	80-120%R	±25%	±10%
117	Iron--Total	AA furnace		3113B-04	80-120%R	80-120%R	±25%	±10%
118	Iron--Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
119	Iron--Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
120	Iron--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
121	Iron--Total	Colorimetric (Phenanthroline)		3500-Fe -97	80-120%R	80-120%R	±25%	±10%
122	Kjeldahl Nitrogen--Total, (as N)	Manual digestion and distillation or gas diffusion followed by any of the following		4500-N _{org} B-97 or C-97 and 4500-NH ₃ B-97	80-120%R	80-120%R	±25%	±10%
123	Kjeldahl Nitrogen--Total, (as N)	Titration		4500-NH ₃ C-97	80-120%R	80-120%R	±25%	±10%
124	Kjeldahl Nitrogen--Total, (as N)	Electrode		4500-NH ₃ D-97 or E-97	80-120%R	80-120%R	±25%	±10%
125	Kjeldahl Nitrogen--Total, (as N)	Semi-automated phenate	350.1 Rev. 2.0 (1993)	4500-NH ₃ G-97 or H-97	90-110%R [EPA]	90-110%R [EPA]	±25%	±10%
126	Kjeldahl Nitrogen--Total, (as N)	Manual phenate, salicylate, or other substituted phenols in Berthelot reaction based methods		4500-NH ₃ F-1997	80-120%R	80-120%R	±25%	±10%
127	Kjeldahl Nitrogen--Total, (as N)	Semi-automated block digester colorimetric (distillation not required)	351.2, Rev. 2.0 (1993)	4500-N _{org} D-97	90-110%R [EPA]	90-110%R [EPA]	±25%	±10%

VELAP 40 CFR 136.3 (Table 1B) Fixed Limits Table

Applicable to testing done by Standard Methods used for VA-DEQ/DMME compliance when methods specify performance-based limits

Line #	Parameter ¹	Methodology ¹	EPA ¹	Approved Standard Methods ¹ (from Standard Methods for the Examination of Water and Wastewater)	Laboratory Fortified Blank (LFB) or Laboratory Control Sample; as Percent Recovery ^{2,3}	Laboratory Fortified Matrix (LFM) also called Matrix Spike (MS); as Percent Recovery ^{2,3}	Precision of Low Level Duplicates - <20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)	Precision of High Level Duplicates - >20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)
128	Lead -- Total	AA direct aspiration		3111 B-99 or C-99	80-120%R	80-120%R	±25%	±10%
129	Lead -- Total	AA furnace		3113 B-04	80-120%R	80-120%R	±25%	±10%
130	Lead -- Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
131	Lead -- Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
132	Lead -- Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
133	Lead -- Total	Colorimetric (Dithizone)		3500-Pb B-97	80-120%R	80-120%R	±25%	±10%
134	Magnesium-- Total, ⁴ mg/L	AA direct aspiration		3111 B-99	80-120%R	80-120%R	±25%	±10%
135	Magnesium-- Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
136	Magnesium-- Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
137	Magnesium-- Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
138	Manganese-- Total	AA direct aspiration		3111 B-99	80-120%R	80-120%R	±25%	±10%
139	Manganese-- Total	AA furnace		3113 B-04	80-120%R	80-120%R	±25%	±10%
140	Manganese-- Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
141	Manganese-- Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
142	Manganese-- Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
143	Manganese-- Total	Colorimetric (Persulfate)		3500-Mn-99	80-120%R	80-120%R	±25%	±10%
144	Mercury--Total	Cold vapor, Manual	245.1, Rev. 3.0 (1994)	3112 B-09	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%

VELAP 40 CFR 136.3 (Table 1B) Fixed Limits Table

Applicable to testing done by Standard Methods used for VA-DEQ/DMME compliance when methods specify performance-based limits

Line #	Parameter ¹	Methodology ¹	EPA ¹	Approved Standard Methods ¹ (from Standard Methods for the Examination of Water and Wastewater)	Laboratory Fortified Blank (LFB) or Laboratory Control Sample; as Percent Recovery ^{2,3}	Laboratory Fortified Matrix (LFM) also called Matrix Spike (MS); as Percent Recovery ^{2,3}	Precision of Low Level Duplicates - <20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)	Precision of High Level Duplicates - >20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)
145	Molybdenum--Total	AA direct aspiration		3111 D-99	80-120%R	80-120%R	±25%	±10%
146	Molybdenum--Total	AA furnace		3113 B-04	80-120%R	80-120%R	±25%	±10%
147	Molybdenum--Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
148	Molybdenum--Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
149	Molybdenum--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
150	Nickel--Total	AA direct aspiration		3111 B-99 or C-99	80-120%R	80-120%R	±25%	±10%
151	Nickel--Total	AA furnace		3113 B-04	80-120%R	80-120%R	±25%	±10%
152	Nickel--Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
153	Nickel--Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
154	Nickel--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
155	Nitrate (as N)	Ion chromatography	300.0, Rev. 2.1 (1993)	4110 B-99 or C-99	90-110%R [EPA]	Until sufficient data available to develop internal limits, 80-120%R (Method A) [EPA]	±25%	±10%
156	Nitrate (as N)	Ion chromatography	300.1, Rev. 1.0 (1997)	4110 B-99 or C-99	MRL to 10x MRL: 75-125%; 10XMRL to highest calibration level: 85-115% [EPA]	75-125% [EPA]	MRL to 10xMRL ± 20 % [EPA]	10xMRL to highest calibration level ± 10 % [EPA]
157	Nitrate (as N)	ICIE/UV		4140 B-97	80-120%R	80-120%R	±25%	±10%
158	Nitrate (as N)	Ion Selective Electrode		4500-NO ₃ D-00	80-120%R	80-120%R	±25%	±10%

VELAP 40 CFR 136.3 (Table 1B) Fixed Limits Table

Applicable to testing done by Standard Methods used for VA-DEQ/DMME compliance when methods specify performance-based limits

Line #	Parameter ¹	Methodology ¹	EPA ¹	Approved Standard Methods ¹ (from Standard Methods for the Examination of Water and Wastewater)	Laboratory Fortified Blank (LFB) or Laboratory Control Sample; as Percent Recovery ^{2,3}	Laboratory Fortified Matrix (LFM) also called Matrix Spike (MS); as Percent Recovery ^{2,3}	Precision of Low Level Duplicates - <20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)	Precision of High Level Duplicates - >20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)
159	Nitrate-nitrite (as N)	Cadmium reduction, Manual		4500-NO ₃ E-00	80-120%R	80-120%R	±25%	±10%
160	Nitrate-nitrite (as N)	Ion chromatography	300.0, Rev. 2.1 (1993)	4110 B-00 or C-00	90-110%R [EPA]	Until sufficient data available to develop internal limits, 80-120%R (Method A) [EPA]	±25%	±10%
161	Nitrate-nitrite (as N)	Automated hydrazine		4500-NO ₃ H-00	80-120%R	80-120%R	±25%	±10%
162	Nitrate-nitrite (as N)	Ion chromatography	300.1, Rev. 1.0 (1997)	4110 B-00 or C-00	MRL to 10x MRL: 75-125%; 10XMRL to highest calibration level: 85-115% [EPA]	75-125% [EPA]	MRL to 10xMRL ± 20 % [EPA]	10xMRL to highest calibration level ± 10 % [EPA]
163	Nitrate-nitrite (as N)	Cadmium reduction, Automated, or	353.2, Rev. 2.0 (1993)	4500-NO ₃ F-00	90-110%R [EPA]	90-110%R [EPA]	±25%	±10%
164	187. Nitrate-nitrite (as N)	CIE/UV		4140 B-97	80-120%R	80-120%R	±25%	±10%
165	Nitrite (as N) ;	Spectrophotometric: Manual		4500-NO ₂ B-00	80-120%R	80-120%R	±25%	±10%
166	Nitrite (as N) ;	Ion chromatography	300.0, Rev. 2.1 (1993)	4110 B-00 or C-00	90-110%R [EPA]	Until sufficient data available to develop internal limits, 80-120%R (Method A) [EPA]	±25%	±10%
167	Nitrite (as N) ;	Manual (*bypass cadmium reduction)		4500-NO ₂ E-00	80-120%R	80-120%R	±25%	±10%
168	Nitrite (as N) ;	Ion chromatography	300.1, Rev. 1.0 (1997)	4110 B-00 or C-00	MRL to 10x MRL: 75-125%; 10XMRL to highest calibration level: 85-115% [EPA]	75-125% [EPA]	MRL to 10xMRL ± 20 % [EPA]	10xMRL to highest calibration level ± 10 % [EPA]

VELAP 40 CFR 136.3 (Table 1B) Fixed Limits Table

Applicable to testing done by Standard Methods used for VA-DEQ/DMME compliance when methods specify performance-based limits

Line #	Parameter ¹	Methodology ¹	EPA ¹	Approved Standard Methods ¹ (from Standard Methods for the Examination of Water and Wastewater)	Laboratory Fortified Blank (LFB) or Laboratory Control Sample; as Percent Recovery ^{2,3}	Laboratory Fortified Matrix (LFM) also called Matrix Spike (MS); as Percent Recovery ^{2,3}	Precision of Low Level Duplicates - <20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)	Precision of High Level Duplicates - >20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)
169	Nitrite (as N) ;	Automated (*bypass cadmium reduction)	353.2, Rev. 2.0 (1993)	4500-NO ₂ F-00	90-110%R [EPA]	90-110%R [EPA]	±25%	±10%
170	Nitrite (as N) ;	CIE/UV		4140 B-97	80-120%R	80-120%R	±25%	±10%
171	Oil and grease-- Total recoverable	Silica gel treated HEM (SGT-HEM): Silica gel treatment and gravimetry.	1664A, 1664B (Criteria same for both A & B)	5520 B-01 ³⁸ and 5520 F-01 ³⁸	64-132%R SGT-HEM [EPA]	64-132%R SGT-HEM [EPA]	34% RPD [EPA]	34% RPD [EPA]
172	Oil and grease-- Total recoverable	Oil and grease and non-polar material : Hexane extractable material (HEM): n-Hexane extraction and gravimetry.	1664A, 1664B (Criteria same for both A & B)	5520 B-01 ³⁸	78-114%R HEM [EPA]	78-114%R HEM [EPA]	18% RPD [EPA]	18% RPD [EPA]
173	Organic carbon-- Total (TOC)	Combustion		5310 B-00	80-120%R	80-120%R	±25%	±10%
174	Organic carbon-- Total (TOC)	Heated persulfate or UV persulfate oxidation.		5310 C-00 or D-00	80-120%R	80-120%R	±25%	±10%
175	Orthophosphate (as P)	Ion chromatography	300.0, Rev. 2.1 (1993)	4110 B-99 or C-00	90-110%R [EPA]	Until sufficient data available to develop internal limits, 80-120%R (Method A) [EPA]	±25%	±10%
176	Orthophosphate (as P)	Manual single reagent		4500-P E-99	80-120%R	80-120%R	±25%	±10%
177	Orthophosphate (as P)	Ion chromatography	300.1, Rev. 1.0 (1997)	4110 B-99 or C-00	MRL to 10x MRL: 75-125%; 10XMRL to highest calibration level: 85-115% [EPA]	75-125% [EPA]	MRL to 10xMRL ± 20 % [EPA]	10xMRL to highest calibration level ± 10 % [EPA]
178	Orthophosphate (as P)	Automated	365.1, Rev. 2.0 (1993)	4500-P F -99 or G-99	90-110%R [EPA]	90-110%R [EPA]	±25%	±10%
179	Orthophosphate (as P)	CIE/UV		4140 B-97	80-120%R	80-120%R	±25%	±10%
180	Osmium--Total	AA direct aspiration, or		3111 D-99	80-120%R	80-120%R	±25%	±10%
181	Oxygen, dissolved	Winkler (Azide modification)		4500-O B-01, C-01, D-01, E-01, F-01	Not Applicable	Not Applicable	±25%	±10%

VELAP 40 CFR 136.3 (Table 1B) Fixed Limits Table

Applicable to testing done by Standard Methods used for VA-DEQ/DMME compliance when methods specify performance-based limits

Line #	Parameter ¹	Methodology ¹	EPA ¹	Approved Standard Methods ¹ (from Standard Methods for the Examination of Water and Wastewater)	Laboratory Fortified Blank (LFB) or Laboratory Control Sample; as Percent Recovery ^{2,3}	Laboratory Fortified Matrix (LFM) also called Matrix Spike (MS); as Percent Recovery ^{2,3}	Precision of Low Level Duplicates - <20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)	Precision of High Level Duplicates - >20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)
182	Oxygen, dissolved	Electrode		4500-O G-01	Not Applicable	Not Applicable	±25%	±10%
183	Palladium--Total	AA direct aspiration		3111 B-99	80-120%R	80-120%R	±25%	±10%
184	Palladium--Total	ICP/MS		3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
185	Phenols	Colorimetric (4AAP) manual	420.1 (Rev. 1978)	5530D-05 ²⁷	Limits not given in EPA method; 80-120%R	Limits not given in EPA method; 80-120%R	±25%	±10%
186	Phosphorus--Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
187	Phosphorus--Total	Automated ascorbic acid reduction	365.1, Rev. 2.0 (1993)	4500-P F -99, G-99, H-99	90-110%R [EPA]	90-110%R [EPA]	±25%	±10%
188	Phosphorus--Total	Manual	365.3 (1978)	4500-P E -99	Limits not given in EPA method; 80-120%R	Limits not given in EPA method; 80-120%R	±25%	±10%
189	Platinum--Total	AA direct aspiration		3111 B-99	80-120%R	80-120%R	±25%	±10%
190	Platinum--Total	ICP/MS		3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
191	Potassium--Total	AA direct aspiration		3111 B-99	80-120%R	80-120%R	±25%	±10%
192	Potassium--Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
193	Potassium--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
194	Potassium--Total	Flame photometric		3500-K B-97	80-120%R	80-120%R	±25%	±10%
195	Potassium--Total	Electrode		3500-K C-97	80-120%R	80-120%R	±25%	±10%
196	Residue--Total	Gravimetric, 103-105°		2540 B-97	Not Applicable	Not Applicable	Refer to Method OR ±25%	Refer to Method OR ±10%

VELAP 40 CFR 136.3 (Table 1B) Fixed Limits Table

Applicable to testing done by Standard Methods used for VA-DEQ/DMME compliance when methods specify performance-based limits

Line #	Parameter ¹	Methodology ¹	EPA ¹	Approved Standard Methods ¹ (from Standard Methods for the Examination of Water and Wastewater)	Laboratory Fortified Blank (LFB) or Laboratory Control Sample; as Percent Recovery ^{2,3}	Laboratory Fortified Matrix (LFM) also called Matrix Spike (MS); as Percent Recovery ^{2,3}	Precision of Low Level Duplicates - <20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)	Precision of High Level Duplicates - >20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)
197	Residue--filterable	Gravimetric, 180°		2540 C-97	Not Applicable	Not Applicable	Refer to Method OR ±25%	Refer to Method OR ±10%
198	Residue--nonfilterable (TSS)	Gravimetric, 103-105° post washing of residue		2540 D-07	Not Applicable	Not Applicable	Refer to Method OR ±25%	Refer to Method OR ±10%
199	Residue--settleable	Volumetric, (Imhoff cone), or gravimetric		2540 F-97	Not Applicable	Not Applicable	Refer to Method OR ±25%	Refer to Method OR ±10%
200	Residue--Volatile	Gravimetric, 550°	160.4 (Issued 1971) (Procedure Refers to SM)	2540 E-97	Not Applicable	Not Applicable	Refer to Method OR ±25%	Refer to Method OR ±10%
201	Rhodium--Total	AA direct aspiration		3111 B-99	80-120%R	80-120%R	±25%	±10%
202	Rhodium--Total	ICP/MS		3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
203	Ruthenium--Total	AA direct aspiration		3111 B-99	80-120%R	80-120%R	±25%	±10%
204	Ruthenium--Total	ICP/MS		3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
205	Selenium--Total	AA furnace		3113 B-04	80-120%R	80-120%R	±25%	±10%
206	Selenium--Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
207	Selenium--Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
208	Selenium--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
209	Selenium--Total	AA gaseous hydride		3114 B-09 or C-09	80-120%R	80-120%R	±25%	±10%
210	Silica --Dissolved	Colorimetric, Manual		4500-SiO ₂ C-97	80-120%R	80-120%R	±25%	±10%
211	Silica --Dissolved	Automated (Molybdosilicate)		4500-SiO ₂ E-97 or F-97	80-120%R	80-120%R	±25%	±10%
212	Silica --Dissolved	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%

VELAP 40 CFR 136.3 (Table 1B) Fixed Limits Table

Applicable to testing done by Standard Methods used for VA-DEQ/DMME compliance when methods specify performance-based limits

Line #	Parameter ¹	Methodology ¹	EPA ¹	Approved Standard Methods ¹ (from Standard Methods for the Examination of Water and Wastewater)	Laboratory Fortified Blank (LFB) or Laboratory Control Sample; as Percent Recovery ^{2,3}	Laboratory Fortified Matrix (LFM) also called Matrix Spike (MS); as Percent Recovery ^{2,3}	Precision of Low Level Duplicates - <20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)	Precision of High Level Duplicates - >20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)
213	Silica --Dissolved	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
214	Silica --Dissolved	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
215	Silver--Total	AA direct aspiration		3111 B-99 or C-99	80-120%R	80-120%R	±25%	±10%
216	Silver--Total	AA furnace		3113 B-04	80-120%R	80-120%R	±25%	±10%
217	Silver--Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
218	Silver--Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
219	Silver--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
220	Sodium--Total	AA direct aspiration		3111 B-99	80-120%R	80-120%R	±25%	±10%
221	Sodium--Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
222	Sodium--Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
223	Sodium--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
224	Sodium--Total	Flame photometric		3500 Na B-97	80-120%R	80-120%R	±25%	±10%
225	Specific conductance, micromhos/cm at 25 °C:	Wheatstone bridge	120.1 (1982)	2510 B-97	Limits not given in EPA method; 80-120%R	Not Applicable	±25%	±10%
226	Sulfate (as SO ₄)	Ion chromatography	300.0, Rev. 2.1 (1993)	4110 B-00 or C-00	90-110%R [EPA]	Until sufficient data available to develop internal limits, 80-120%R (Method A) [EPA]	±25%	±10%
227	Sulfate (as SO ₄)	Gravimetric		4500-SO ₄ C-97 or D-97	80-120%R	80-120%R	±25%	±10%

VELAP 40 CFR 136.3 (Table 1B) Fixed Limits Table

Applicable to testing done by Standard Methods used for VA-DEQ/DMME compliance when methods specify performance-based limits

Line #	Parameter ¹	Methodology ¹	EPA ¹	Approved Standard Methods ¹ (from Standard Methods for the Examination of Water and Wastewater)	Laboratory Fortified Blank (LFB) or Laboratory Control Sample; as Percent Recovery ^{2,3}	Laboratory Fortified Matrix (LFM) also called Matrix Spike (MS); as Percent Recovery ^{2,3}	Precision of Low Level Duplicates - <20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)	Precision of High Level Duplicates - >20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)
228	Sulfate (as SO ₄)	Turbidimetric		4500-SO ₄ E-97	80-120%R	80-120%R	±25%	±10%
229	Sulfate (as SO ₄)	Ion chromatography	300.1, Rev. 1.0 (1997)	4110 B-00 or C-00	MRL to 10x MRL: 75-125%; 10xMRL to highest calibration level: 85-115% [EPA]	75-125% [EPA]	MRL to 10xMRL ± 20 % [EPA]	10xMRL to highest calibration level ± 10 % [EPA]
230	Sulfate (as SO ₄)	Automated colorimetric (barium chloranilate)	375.2, Rev. 2.0 (1993)	4500-SO ₄ F-97 or G-97	90-110%R [EPA]	90-110%R [EPA]	±25%	±10%
231	Sulfate (as SO ₄)	CIE/UV		4140 B-97	80-120%R	80-120%R	±25%	±10%
232	Sulfide (as S)	Titrimetric (iodine)		4500-S ⁻² F-00	80-120%R	80-120%R	±25%	±10%
233	Sulfide (as S)	Colorimetric (methylene blue)		4500-S ⁻² D-00	80-120%R	80-120%R	±25%	±10%
234	Sulfide (as S)	Ion Selective Electrode		4500-S ⁻² G-00	80-120%R	80-120%R	±25%	±10%
235	Sulfite (as SO ₃)	Titrimetric (iodine-iodate)		4500-SO ₃ ⁻² B-00	80-120%R	80-120%R	±25%	±10%
236	Surfactants	Colorimetric (methylene blue)		5540 C-00	80-120%R	80-120%R	±25%	±10%
237	Temperature, °C	Thermometric		2550 B-00	Not Applicable	Not Applicable	Not Applicable	Not Applicable
238	Thallium--Total	AA direct aspiration		3111 B-99	80-120%R	80-120%R	±25%	±10%
239	Thallium--Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
240	Thallium--Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
241	Thallium--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
242	Thallium--Total	AA furnace	279.2 (1978)	3113 B-04	Limits not given in EPA method; 80-120%R	Limits not given in EPA method; 80-120%R	±25%	±10%
243	Tin--Total	AA direct aspiration		3111 B -99	80-120%R	80-120%R	±25%	±10%
244	Tin--Total	AA furnace, or		3113 B -04	80-120%R	80-120%R	±25%	±10%
245	Tin--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
246	Titanium--Total	AA direct aspiration		3111 D-99	80-120%R	80-120%R	±25%	±10%

VELAP 40 CFR 136.3 (Table 1B) Fixed Limits Table

Applicable to testing done by Standard Methods used for VA-DEQ/DMME compliance when methods specify performance-based limits

Line #	Parameter ¹	Methodology ¹	EPA ¹	Approved Standard Methods ¹ (from Standard Methods for the Examination of Water and Wastewater)	Laboratory Fortified Blank (LFB) or Laboratory Control Sample; as Percent Recovery ^{2,3}	Laboratory Fortified Matrix (LFM) also called Matrix Spike (MS); as Percent Recovery ^{2,3}	Precision of Low Level Duplicates - <20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)	Precision of High Level Duplicates - >20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)
247	Titanium--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
248	Turbidity, NTU	Nephelometric	180.1, Rev. 2.0 (1993)	2130 B-01	Not Applicable	Not Applicable	Not Applicable	Not Applicable
249	Vanadium--Total	AA direct aspiration		3111 D -99	80-120%R	80-120%R	±25%	±10%
250	Vanadium--Total	AA furnace		3113 B -04	80-120%R	80-120%R	±25%	±10%
251	Vanadium--Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
252	Vanadium--Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
253	Vanadium--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
254	Vanadium--Total	Colorimetric (Gallic acid)		3500-V B-97	80-120%R	80-120%R	±25%	±10%
255	Zinc--Total	AA direct aspiration		3111 B-99 or C-99	80-120%R	80-120%R	±25%	±10%
256	Zinc--Total	ICP/AES - Axially Viewed	200.5, Rev.4.2 (2003)	3120 B-99	90-110%R [EPA]	85-115%R [EPA]	±25%	±10%
257	Zinc--Total	ICP/AES	200.7 Rev 4.4 (1994)	3120 B-99	85-115%R [EPA]	70-130%R [EPA]	±25%	±10%
258	Zinc--Total	ICP/MS	200.8, Rev 5.4 (1994)	3125 B-09	Refer to Method	Refer to Method	Refer to Method	Refer to Method
259	Zinc--Total	Colorimetric (Dithizone) (Zincon)		3500-Zn B-97	80-120%R	80-120%R	±25%	±25% [SM 18]

VELAP 40 CFR 136.3 (Table 1B) Fixed Limits Table

Applicable to testing done by Standard Methods used for VA-DEQ/DMME compliance when methods specify performance-based limits

Line #	Parameter ¹	Methodology ¹	EPA ¹	Approved Standard Methods ¹ (from <i>Standard Methods for the Examination of Water and Wastewater</i>)	Laboratory Fortified Blank (LFB) or Laboratory Control Sample; as Percent Recovery ^{2,3}	Laboratory Fortified Matrix (LFM) also called Matrix Spike (MS); as Percent Recovery ^{2,3}	Precision of Low Level Duplicates - <20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)	Precision of High Level Duplicates - >20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)

¹ See 40CFR136.3 Table 1B at www.ecfr.gov for additional information associated with 40CFR136.3 Table 1B, such as footnotes and comments.

² See published methods in their entirety for analytical information and full context, and for QA/QC information including calculation of Percent Recovery and RPD.

Note: Some methods (for example, SM 3000-series (SM 3020-2005 Quality Control Practices) have fixed limits designated with language such as "... should be between 70% and 130%." These method-specific guidelines may be used by a laboratory in lieu of limits in this chart, for applicable methods.

³**This table represents evaluation criteria derived from the referenced EPA method (noted as [EPA]), when available, or from Standard Methods 18th Edition 1020 Table 1020:I.**

APPROVED ALTERNATE FOR *EVALUATION OF DUPLICATES*: As an alternate to evaluation of duplicates with a two tier evaluation criteria based on sample concentration as described in the table, the adoption of **±20% RPD for all sample concentrations** is acceptable to VA DEQ. *See SM 1020 B.8 regarding allowances for evaluation of low level duplicates. Information in this table does not supersede method-specified directives.*

Refer to the published method for required QC elements. If a QC element is not required according to the published method, the limits in this table are not applicable.

Whenever the accredited method specifies minimum data quality objectives, those quality objectives within the accredited method must be met.

This table establishes the acceptance criteria where data must be qualified and at which corrective action must be taken for failed QA/QC. Refer to the VELAP guidance document, "Performance-Based and Fixed Limits for Laboratory Quality Control", on the VELAP web page: www.dgs.virginia.gov/dcls. Refer to the related Frequently Asked Questions document on the VELAP web page. (Go to the section for 2012 MUR-related Information.)

Please immediately report any noted errors or omissions in this document via email to: Lab_Cert@dgs.virginia.gov. This document is subject to revisions or updates as needed.

VELAP 40 CFR 136.3 (Table 1B) Fixed Limits Table

Applicable to testing done by Standard Methods used for VA-DEQ/DMME compliance when methods specify performance-based limits

Line #	Parameter ¹	Methodology ¹	EPA ¹	Approved Standard Methods ¹ (from <i>Standard Methods for the Examination of Water and Wastewater</i>)	Laboratory Fortified Blank (LFB) or Laboratory Control Sample; as Percent Recovery ^{2,3}	Laboratory Fortified Matrix (LFM) also called Matrix Spike (MS); as Percent Recovery ^{2,3}	Precision of Low Level Duplicates - <20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)	Precision of High Level Duplicates - >20x MDL unless noted; as Relative Percent Difference (RPD) ^{2,3} (SEE NOTES FOR APPROVED ALTERNATE)
--------	------------------------	--------------------------	------------------	--	---	---	---	--

CHANGE LOG

Date of change: Change made:

- 6/22/2015
 - 1) Simplified: Removed "ASTM" and "USGS/AOAC/Other" columns.
 - 2) Simplified: Removed rows not related to a Standard Methods reference.
 - 3) Edited header: "Standard Methods for the ~~Determination~~ Examination of Water and Wastewater" and added Table Subtitle.
 - 4) Edited method reference for Hydrogen ion (pH): "4500-H+ B-00".
 - 5) Edited for consistency with SM Table 2020:II-2010 (notations made when QC elements are not required per the table).
 - 6) Edited SM 2540 B, C, D, E, and F duplicate columns to add "See Method". Evaluation criteria in method designated with "should" is acceptable.
 - 7) Edited for consistency with SM Table 4020:I-2011 (notations made when QC elements are not required per the table).
 - 8) Edited footer notes for clarity and included a reference to the associated guidance document and FAQ document.
 - 9) Inserted new line numbering after simplification.
 - 10) Removed notation "[SM18]" and changed "See Method" to "Refer to Method" throughout table.
 - 11) Added APPROVED ALTERNATE for Precision of Duplicates (note to column header and note in footer).
- 9/10/2015
 - 1) Edited the duplicate/RPD limits for Oil and Grease as HEM and as HEM-SGT to be consistent with EPA 1664 A and B.
 - 2) Added note to "footnotes" of table regarding low level duplicates, referencing language in SM 1020 B.8.
- 2/9/2016
 - 1) Edited row 138 to be "Manganese, Total" rather than "Magnesium, Total".