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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER

**EPA METHOD 334.0 RECORD OF
ANALYST INITIAL DEMONSTRATION OF CAPABILITY**

I. General Information

PWSID: 5100.324 System Name: Moniteau School District Date: 4/13/22
 Analyst Name¹: Jeffrey C. Campbell Analysis Method: DPD Supervisor Initials: WEH
 Analyzer Manufacturer: Hach Analyzer Model: DR900 Serial Number: 181790001073

¹ Each person who conducts chlorine analysis must perform an Initial Demonstration of Capability prior to using the grab sample method for compliance monitoring or to verify the accuracy of on-line chlorine analyzers used for compliance monitoring.

II. Independent Reference Sample Analyses

Independent Reference Sample Concentration (A): 0.98 mg/L

Sample	Measured Concentration (mg/L)	Corrected Concentration (B) Measured Concentration – Method Blank (mg/L)
Method Blank ²	0.0	
1	.84	.84
2	.84	.84
3	.84	.84
4	.84	.84
5	.88	.88
Average of Corrected Concentrations (C) ³ :		4.24 0.848

III. Initial Demonstration of Accuracy

Average of Corrected Concentrations (C)	Reference Sample Concentration (A)	Reference Sample Concentration (A)	Percent Difference
<u>.85</u>	<u>.98</u>	<u>0.98</u>	<u>13.3</u>
$(.85 - .98) \div 0.98 = -0.132$			X 100 =
Is the average concentration of the five replicates (C) within ±15% of the independent reference sample concentration (A)?			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

² The method blank concentration must be ≤ 1/3 the concentration of the lowest standard used to prepare / verify the calibration curve for the meter.
³ Sum of the five Corrected Concentrations divided by 5. Do not include the method blank measured concentration.

- 0.88 step

IV. Initial Demonstration of Precision

Standard Deviation

Sample	Corrected Concentration (B)	Average of Corrected Concentrations (C)	Difference Between Corrected & Average of Corrected Concentrations (B - C)	Square of Difference between Corrected and Average of Corrected Concentrations (B - C) ²
1	.84	.85	0.01	0.0001
2	.84	.85	0.01	0.0001
3	.84	.85	0.01	0.0001
4	.84	.85	0.01	0.0001
5	.88	.85	0.03	0.0009
Average of (B - C) ² values ⁴				0.00026
Standard Deviation (S) ⁵				0.0051
$\sqrt{\text{Average of } (B - C)^2}$				

4. Sum of the five (B - C)² values divided by 5
5. The square root of the average of the (B - C)² values

Relative Standard Deviation (RSD)

Standard Deviation (S)	Average of Corrected Concentrations (C)	RSD (%)
0.0051	.85	0.6

(0.0051 ÷ .85) X 100 = 0.6

Is the relative standard deviation (RSD) less than or equal to (≤) 15%?

<u>Yes</u> <input checked="" type="checkbox"/>	<u>No</u> <input type="checkbox"/>
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Calibration Standard Solution Manufacturer: HACH

Calibration Standard Solution Expiration Date: 09/2023 Lot Number: A13.37

Initial Demonstration of Capability⁶: PASS FAIL

6. Indicate Pass or Fail based on results of Initial Demonstration of Accuracy and Initial Demonstration of Precision. In order to pass the Initial Demonstration of Capability, Percent Difference must be within ±15% for the Initial Demonstration of Accuracy and Relative Standard Deviation must be ≤ 15% for the Initial Demonstration of Precision.

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EPA METHOD 334.0 RECORD OF INITIAL CALIBRATION VERIFICATION FOR HANDHELD & BENCHTOP ANALYZERS

I. General Information

PWSID: 5100324 System Name: Moniteau School District Date: April 13, 2022
 Calibration Verification Performed By: Jeffrey C. Campbell Supervisor Initials: AIS
 Analyzer Manufacturer: HACH Analyzer Model: DR 900 Serial Number¹: 181790001073

1. An initial calibration curve verification must be conducted for each meter used for grab sample analysis where the results are used for compliance reporting or to verify the accuracy of on-line chlorine analyzers used for compliance monitoring.

II. Standard Calibration

Standard	Reference Standard Concentration ^{2,3} (A) (mg/L)	Measured Concentration (mg/L)	Corrected Concentration (B) (Measured Concentration – Method Blank) (mg/L)	Percent Difference ⁴ $\frac{(B-A)}{A} \times 100$	Percent Difference within $\pm 15\%$?	
Method Blank	0.00	0.00				
Calibration Standard 1	0.20	0.18	0.18	-10.0	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Calibration Standard 2	1.11	0.97	0.97	-12.6	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Calibration Standard 3	2.16	1.85	1.85	-10.7	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

2. At a minimum, three aqueous calibration standards must be analyzed in addition to a method blank (reagent water). The standards must span the range of concentrations that is routinely observed during grab sample analysis.
3. The lowest calibration standard concentration must be at or below 0.2 mg/L or the minimum chlorine residual required by regulation.
4. If the corrected concentration is not within $\pm 15\%$ of the reference standard concentration, the cause of the discrepancy must be identified and resolved prior to utilizing the meter for analysis of samples for compliance or comparative verification purposes. The initial calibration verification must be repeated until all results are within the acceptable range.

Calibration Standard Solution Manufacturer: Hach

Calibration Standard Solution Expiration Date: 09/2023 Lot Number: A1337

CALIBRATION VERIFICATION⁵: PASS FAIL

5. Indicate Pass or Fail based on Percent Difference calculations. In order to pass the Initial Calibration Verification, the Percent Difference must be within $\pm 15\%$ of the Reference Standard Concentration for each calibration standard.

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EPA METHOD 334.0 RECORD OF INITIAL CALIBRATION VERIFICATION FOR HANDHELD & BENCHTOP ANALYZERS

I. General Information

PWSID: 5100316 System Name: DASSA M^cKinney Elem. School Date: 4/13/22

Calibration Verification Performed By: Jeffrey C. Campbell Supervisor Initials: ATS

Analyzer Manufacturer: Hach Analyzer Model: DR900 Serial Number¹: 1912800010L3

- ¹. An initial calibration curve verification must be conducted for each meter used for grab sample analysis where the results are used for compliance reporting or to verify the accuracy of on-line chlorine analyzers used for compliance monitoring.

II. Standard Calibration

Standard	Reference Standard Concentration ^{2,3} (A) (mg/L)	Measured Concentration (mg/L)	Corrected Concentration (B) (Measured Concentration – Method Blank) (mg/L)	Percent Difference ⁴ $\frac{(B-A)}{A} \times 100$	Percent Difference within $\pm 15\%$?	
Method Blank	0.00	0.00				
Calibration Standard 1	0.20	0.17	0.17	-15.0	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Calibration Standard 2	1.11	0.95	0.95	-14.4	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Calibration Standard 3	2.16	2.00	2.00	-7.4	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

- ². At a minimum, three aqueous calibration standards must be analyzed in addition to a method blank (reagent water). The standards must span the range of concentrations that is routinely observed during grab sample analysis.
- ³. The lowest calibration standard concentration must be at or below 0.2 mg/L or the minimum chlorine residual required by regulation.
- ⁴. If the corrected concentration is not within $\pm 15\%$ of the reference standard concentration, the cause of the discrepancy must be identified and resolved prior to utilizing the meter for analysis of samples for compliance or comparative verification purposes. The initial calibration verification must be repeated until all results are within the acceptable range.

Calibration Standard Solution Manufacturer: HACH

Calibration Standard Solution Expiration Date: 09/2023 Lot Number: A1337

CALIBRATION VERIFICATION⁵: PASS FAIL

- ⁵. Indicate Pass or Fail based on Percent Difference calculations. In order to pass the Initial Calibration Verification, the Percent Difference must be within $\pm 15\%$ of the Reference Standard Concentration for each calibration standard.