

ANALYST:		VPDES NO	
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Meter: \_\_\_\_\_

Parameter: Hydrogen Ion (pH)  
 Method: Electrometric  
3/2015

METHOD OF ANALYSIS:

	21 <sup>st</sup> Edition of Standard Methods (SM 21) – 4500-H <sup>+</sup> B-2000 (SM 21 pH)
	22 <sup>nd</sup> Edition of Standard Methods (SM 22), or Online Editions of Standard Methods – 4500-H <sup>+</sup> B-2011 (SM 22 pH)

***pH is a method-defined analyte so modifications are not allowed. [40 CFR Part 136.6]***

	Y	N
1) Is a certificate of operator competence or initial demonstration of capability available for <u>each analyst/operator</u> performing this analysis? <b>NOTE:</b> Analyze 4 samples of known pH; you may use an external source of buffers or other known standards (different lot/manufacturer than buffers used to calibrate meter). Recovery for each of the 4 samples must be +/- 0.2 SU of the known concentration of the sample or within "Acceptable Range" specified by the PT provider. [SM 1020 B.1] <b>NOTE: The same pH buffer [values] used for calibration of the instrument can be used as LCS if from a different source or different lot.</b>		
2) <b>IF</b> a replicate sample is analyzed is there a written procedure for which result will be reported on DMR (Sample or Replicate) and is this procedure being followed? [DEQ – based on EPA Good Laboratory Practices Standards]		
3) Is a Laboratory Control Sample (LCS) tested at least annually and are results within acceptance criteria? [SM 21 B.2 or SM 22 1020 B.3.] <b>NOTE:</b> LCS should be a purchased Proficiency Test (PT) sample or a different buffer other than ones used for calibration of the meter [with a ±0.2 SU acceptance range or within "Acceptable Range" specified by the PT provider].. <b>NOTE: The same pH buffer [values] used for calibration of the instrument can be used as LCS if from a different source or different lot.</b>		
4) Is the electrode in good condition (no chloride precipitate, scratches, deterioration, etc.)? [SM 21 pH or SM 22 pH 2.b./c. and 5.b.]		
5) Is electrode storage solution in accordance with manufacturer's instructions? [SM 21 pH or SM 22 pH 4.a. and Mfr.]		
6) Is meter calibrated on at least a daily basis using three buffers all of which are at the same temperature? [SM 21 pH or SM 22 pH 4.a.] <b>NOTE:</b> Start with Buffer 7 unless manufacturer's instructions state otherwise. <b>NOTE:</b> If meter is not capable of 3 buffer calibration use 2 buffers bracketing the expected sample pH and then <u>measure</u> a 3 <sup>rd</sup> buffer (the measurement value recorded must be ±0.1 SU), and then <u>re-read and record</u> value of buffer 7 to ensure ±0.1 SU.]		
7) After calibration, is a buffer analyzed as a check sample to verify that calibration is correct? Verification measurement should be within +/- 0.1 SU. [SM 21 1020 B 10.c. or SM 22 1020 B 11.c.]		
8) Is calibration verification measurement repeated with every 10 samples and at the end of a series of samples? Verification measurement should be within +/- 0.1 SU. [SM 21 pH or SM 22 pH 4020 B 2.b.] <b>NOTE:</b> Not applicable if pH meter is calibrated before taking any measurement (e.g., if operator monitors daily pH at more than one facility and calibrates before each measurement).		
9) Do the buffer solutions appear to be free of contamination or growths? [SM 21 pH or SM 22 pH 3.a.]		
10) Are buffer solutions within the listed shelf-life or have they been prepared within the last 4 weeks? [SM 21 pH or SM 22 pH 3.a.]		
11) Is the cap or sleeve covering the access hole on the reference electrode removed when		

measuring pH? [Mfr.]

- 12) Is sample analyzed within 15 minutes of collections? [40 CFR Part 136]
- 13) Is the electrode rinsed and then blotted dry between reading solutions (Disregard if a portion of the next sample analyzed is used as the rinsing solution.)? [SM 21 pH or SM 22 pH 4.a and 4.b]
- 14) Is the sample stirred gently at a constant speed during measurement? [SM 21 pH or SM 22 pH 4.b.]
- 15) Does the meter hold a steady reading after reaching equilibrium? [4.b.]


PROBLEMS: