

## pH - Ion-Selective Electrode (ISE) Method Checklist \* REV. 11/17/23

Based on NR 219 (2022), and Standard Methods 4500-H<sup>+</sup> B (2000 and 2011)

Some questions may not be applicable to every lab. If applicable, all answers must be "yes" to be in compliance.

**\*This checklist was created for the aid of registered laboratories. It is only an internal audit guideline; it is not meant to be comprehensive of all regulatory requirements, to dictate DNR audit format, or to include all acceptable method options.**

**Laboratories must comply with all applicable code and method requirements whether listed on this checklist or not. Laboratories are not required to be accredited for wastewater pH analysis, but approved methods must still be followed.**

	Sample Storage and Handling	Y	N	Notes	Reference
1	Are samples for field pH analyzed within the hold time of 15 minutes from collection?				NR 219 Table F

	Reagents and Standards	Y	N	Notes	Reference
2	Are the standards (buffers) unexpired? <i>(It is best to use fresh buffers. Quickly pour off some buffer from the stock bottle into a clean beaker or bottle and close the bottle ASAP.)</i>				SM 4500-H <sup>+</sup> B (3)(a); Manufacturer's requirements

	Equipment	Y	N	Notes	Reference
3	Does the pH meter/probe utilize automatic temperature compensation (ATC)?				SM 4500-H <sup>+</sup> B (2)(a)
4	Is the pH meter/probe maintained properly (including refilling solution amount, solution changes, proper storage, etc., per manufacturer)?				SM 4500-H <sup>+</sup> B (2)(a), (2)(b), (2)(c), B (4)(a)
5	Unless the probe has a built in stirrer, is a stir plate and stir bar used during measurements?				SM 4500-H <sup>+</sup> B (2)(e), (4)(a), (4)(b)
6	Is the probe kept wet by returning it to the proper storage solution whenever it's not in use?				SM 4500-H <sup>+</sup> B (2)(b), (2)(c), B (4)(a)

	Calibration/Sample Measurement	Y	N	Notes	Reference
7	Is the meter calibrated at least daily and as needed with at least 2 standards? <i>(recommend ~every 4 hours)</i>				SM 4500-H <sup>+</sup> B (4)(a)
8	If more than two buffers are used for calibration, is the correct calibration algorithm used in the meter based on the number of buffers used for calibration? <i>(Refer to the user manual as some meters may not be equipped to handle 3 buffers.)</i>				SM 4500-H <sup>+</sup> B (4)(a)
9	Are the standards approximately 3 pH units apart?				SM 4500-H <sup>+</sup> B (4)(a)
10	Do the standards bracket the pH of the samples measured?				SM 4500-H <sup>+</sup> B (4)(a)
11	Does the calibration yield a slope as required by meter/probe manufacturer?				SM 4500-H <sup>+</sup> B (4)(a)
12	Is there enough buffer or sample to cover the sensing elements of the probe and have adequate clearance for the stir bar?				SM 4500-H <sup>+</sup> B (4)(b)
13	Are buffers and samples slowly stirred at a consistent rate?				SM 4500-H <sup>+</sup> B (4)(b)
14	Is the electrode thoroughly rinsed with DI water and gently wiped between measurements?				SM 4500-H <sup>+</sup> B (4)(b)

15	If using a refillable probe, is the electrolyte refill plug out of the hole when taking measurements?				Manufacturer's Owner's Manual
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Reporting and Qualifiers		Y	N	Notes	Reference
16	Are results qualified if samples were analyzed past hold time? ( <i>within 15 minutes of collection for field pH</i> )				NR 219 Table F

Documentation and Records - Are all of the following documented or recorded, if applicable?		Y	N	Notes	Reference
17	Sample collection date and time				WPDES Permit
18	Analyst				WPDES Permit
19	Analysis date				WPDES Permit
20	Analysis time				WPDES Permit
21	Unique sample IDs				WPDES Permit
22	Lot or lab ID of standards (buffers)				WPDES Permit
23	Calibration slope				WPDES Permit
24	Units (e.g., mL, abs)				WPDES Permit
25	Instrument maintenance				WPDES Permit

Other Observations

WI DNR pH Resources
DNR Website (which includes the resources below): <a href="#">Laboratory Certification   Wisconsin DNR</a>
Example pH SOP template
Example pH benchsheet
Example equipment maintenance log
Example prepared and purchased chemical tracking logs
Example general corrective action log
Lab Accreditation Program staff - contact any staff with questions or concerns, especially if there are ongoing QC issues