TO: Joint Committee on Drinking Water Treatment Units

FROM: Dr. Robert Powitz, Chair of the Joint Committee

DATE: November 15, 2022

SUBJECT: Proposed revisions to NSF/ANSI 55: *Ultraviolet Microbiological Water Treatment Systems* (55i65r1)

Revision 1 of NSF/ANSI 55 issue 65 is being forwarded to the Joint Committee for consideration. Please review the proposal and **submit your ballot by December 6, 2022** via the NSF Online Workspace <www.standards.nsf.org>.

Please review all ballot materials. When adding comments, please include the section number applicable to your comment and add all comments under one comment number whenever possible. If you need additional space, please use the attached blank comment template in the reference documents and upload online via the browse function.

Purpose

The proposed revisions will update normative references, correct a typo and section references, update the NIST mass spectral library version, and change normative language from “must” to “shall.”

If you have any questions about the technical content of the ballot, you may contact me in care of:

Dr. Robert Powitz
Chair, Joint Committee on Drinking Water Treatment Units
c/o Monica Milla
Joint Committee Secretariat
NSF
Tel: (734) 214-6223
Email: mmilla@nsf.org

[Note – The recommended changes to the standard which include the current text of the relevant section(s) indicate deletions by use of ~~strikeout~~ and additions by gray highlighting. Rationale statements are in *italics* and only used to add clarity; these statements will NOT be in the finished publication.]

NSF/ANSI Standard
for Drinking Water Treatment Units –

Ultraviolet Microbiological Water Treatment Systems

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2 Normative references

The following documents contain requirements that, by reference in this text, constitute requirements of this standard. At the time of publication, the indicated editions were valid. All of the documents are subject to revision and parties are encouraged to investigate the possibility of applying the recent editions of the documents indicated below. The most recent published edition of the document shall be used for undated references.

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EPA 600/4-79-020, *Methods for the Chemical Analysis of Water and Wastes*, March 1983[10]

EPA 600/4-82-057~~ 4-84-053,~~ *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater*, May 2002~~ June 1984~~**[Error! Bookmark not defined.]**

EPA 600/4-88-039, *Methods for the Determination of Organic Compounds in Drinking Water*, December 1988**[Error! Bookmark not defined.]**

EPA 600/4-90-020, *Methods for the Determination of Organic Compounds in Drinking Water, Supplement 1*, July 1990**[Error! Bookmark not defined.]**

EPA 600/R-94-111, *Methods for the Determination of Metals in Environmental Samples, Supplement 1,* May 1994**[Error! Bookmark not defined.]**

NIST Standard Reference Database 1A (NIST/EPA/NIH Mass Spectral Library with Search Program), NIST20/NIST v20)[11]

NSF/ANSI 53, *Drinking Water Treatment Units – Health Effects*

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[11] National Institute of Standards and Technology. 100 Bureau Drive, Gaithersburg, MD 20899. <www.nist.gov>

Rationale: Corrects document number and publication year of an EPA document and adds a normative reference for the NIST mass spectral library.

4.3 Gas chromatography / mass spectroscopy (GC/MS) analysis

4.3.1 General requirements for GC/MS analysis

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4.3.1.2 TICs are identified by comparison of the spectrum of the unknown to the mass-spectral reference library utilizing "probability-based matching" (as available from instrument manufacturers) as well as interpretation by the analyst. The laboratory shall report the TIC with the best match factor (the match factor shall not be reported) except in the following circumstances:

— due to the complex nature of GC/MS interpretation and identification, when reviewing the list of possible matches for any particular TIC peak, the laboratory has the authority to assign the identification to a compound "hit" with a lower numeric match factor from the library search algorithm;

— the laboratory may determine that none of the returned compounds by the automated search algorithm is a good match for the unknown peak. In this case the compound is reported as an "unknown";

— the laboratory may utilize manual spectral interpretation to identify the peak in question;

— all TICs detected at a concentration greater than or equal to 3.0 ppb shall be reported.

The library used during the analysis shall be National Institute of Standards and Technology (NIST) v20 (NIST20) ~~2007~~ or most current version. Additional spectral libraries may be used to assist in the identification of unknown compounds. For TICs, the concentration is estimated by comparison of its total ion area response to the total ion area response of the nearest internal standard. For TICs, a response factor of "1" (one) shall be utilized for the purposes of calculating the TICs estimated concentration.

Rationale: Updates the NIST mass spectral library version and corrects "spectra" or "spectral".

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Table 4.3
Extraction testing parameters (volatiles)

Analyte	**CAS Number**	**Maximum reporting limit (RL) (mg/L)**	**US EPA Method(s)**
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xylenes (total) o-xylene~~[2]~~ or 1,2-xylene, m-xylene, p-xylene	95-47-6 106-42-3 108-38-3	0.1	524.2, 524.3
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Rationale: Removes footnote citation added in error.

7 Elective performance claims – Test methods

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7.2.1.2 Apparatus

An apparatus shall be assembled in which a small stirred sample can be irradiated in a nearly collimated beam. A radiometer meeting specification in Section 7.2.1.2.1 can then be used to measure the incident irradiance (*Eo*).

A low-pressure mercury vapor UV lamp shall be wired to a ballast and a voltage regulator (Figure 2). A solution contained in a small dish equal to or smaller in diameter than that of the collimated tube shall be used. The solution shall be 1 cm deep. *Eo* shall be measured at the surface of the liquid by removing the dish and stirrer and placing the radiometer at the corresponding position from which the dish was removed.

The UV irradiance at each point of the surface shall be within ± 5% of the average irradiance across the solution surface.

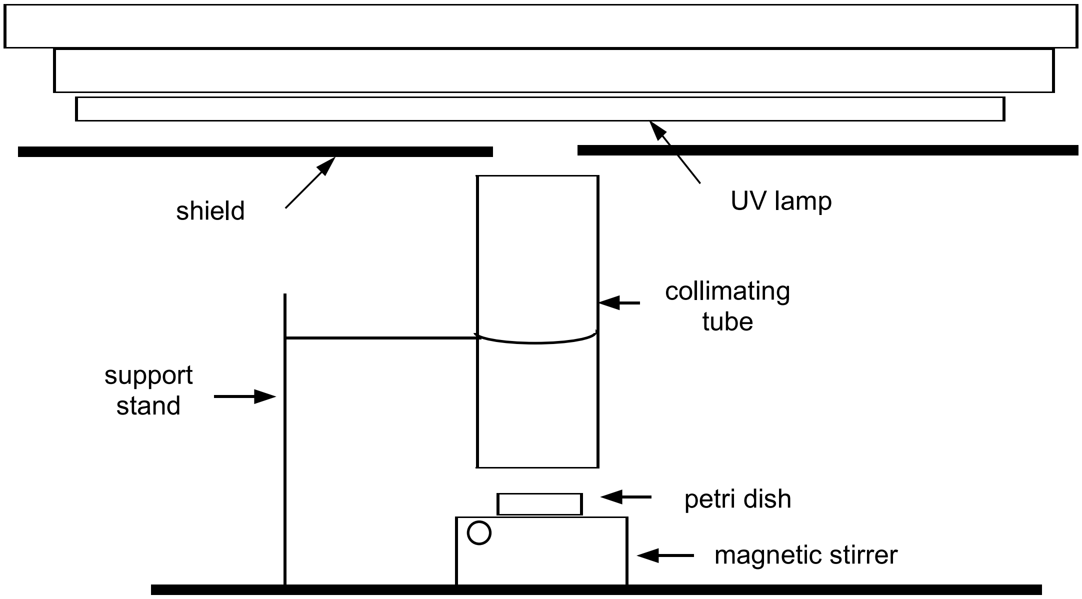

Figure 2
Collimated beam apparatus

- the pathlength of the ultraviolet light column shall be a minimum of 53 cm (21in) in length and the interior shall be painted flat black. The light pathlength shall ~~must~~ also be at least 6 times the diameter of the suspension's surface;

- the support stand, if used, shall be adjustable to raise or lower the collimating tube to the surface of the petri dish;

- the petri dish shall be set so the surface of the liquid is at the same level as the radiometer; and

- measurement of the UV dose shall be done at the same point at which the petri dish surface is exposed.

Rationale: Changes normative language from "must" to "shall".

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7.3.1.7 Microbiological test method – Flow through systems

Table 7.2
Sampling for disinfection performance

Sampling point		**Influent**	**Effluent**
Day 0	condition system	no sample	no sample
Day 1	start up	x	x[1]
	4 h	x	x[2]
Day 2	start up	x	x[1]
	4 h	x	x[2]
Day 3	start up	x	x[1]
	4 h	x	x[2]
Day 4	start up	x	x[1]
	4 h	x	x[2]
Days 5, 6	48 to 72 h stagnation	no sample	no sample
Day 7	start up	x	x[1]
	4 h	x	x[2]

[1] Samples shall be collected at the start-up of each day following a minimum 16-h stagnation according to the sampling requirements in Sections ~~7.3.2.7~~ 7.3.1.7 and ~~7.3.2.8~~ 7.3.1.8. Samples shall be of the first 3 unit void volumes (or minimum quantity required for analysis, whichever is larger) from the system or component. Sampling will be delayed until the plumbing downstream of the three-way valve and the sampling point has been purged.

[2] Samples shall be collected after a minimum of 15 min of operation.

Rationale: Corrects section references.