TO: Joint Committee on Wastewater Technology

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

DATE: June 6, 2023

SUBJECT: Proposed revisions to:
NSF/ANSI 40 *Residential wastewater treatment systems (40i56r1)*
NSF/ANSI 245 *Wastewater treatment systems – Nitrogen reduction (245i36r1)*
NSF/ANSI 350 *Onsite residential and commercial, water reuse treatment systems (350i79r1)*

Revision 1 of NSF/ANSI 40, issue 56, NSF/ANSI 245, issue 36, and NSF/ANSI 350, issue 79 is being forwarded to the Joint Committee for consideration. Please review the proposal and submit your ballot by **June 27, 2023** 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
This ballot will remove alternate aerator testing from NSF/ANSI 40, 245, and 350.

Background
The issue proponent notes that in 2017 the Joint Committee approved the addition of language to these Standards to add a requirement to test the blowers if they were used in Standards 40, 245 and/or 350. There was an agreement when this was passed by the JC that if a blower manufacturer wanted to submit their blower for testing that NSF would test the blower over the range of the blower curve to verify the air flow. Any manufacturer covered under these Standards who used this blower would not be required to test a blower as it had already been verified by the blower manufacturer. If a manufacturer covered under these Standards submitted a blower to NSF that had not been verified by the blower manufacturer, NSF would only test that blower only for one data point being the air flow at the design pressure for that technology. This is implied to be this way in a careful reading of the following: Std. 40 Section 8.1.8, Std. 245 Section 8.1.8 to 8.1.10, and Std. 350 Section 5.11, 8.1.1.8 and 8.2.1.8.

This issue paper was presented at the 2023 Wastewater Technologies Joint Committee meeting, and after much discussion, motions were made and approved to send language to ballot removing both the aerator testing and scale up annex from the standards. The scaling language will be addressed in a subsequent ballot.

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

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Chair, Joint Committee on Wastewater Technology
c/o Joint Committee Secretariat
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NSF
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[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 grey 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 Wastewater Technology –

Residential Wastewater Treatment Systems

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5 Design and construction

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~~**5.11 Alternate air delivery components**~~

~~To ensure stabilized air flow conditions are met, proposed alternate air delivery components – either air compressors or blowers – that create air pressure shall be run for a minimum of 4 h at the system pressure recorded at the outset of the evaluation of the system as outlined in Section 8.1.8. The alternate air delivery components must deliver flow in the range of 90% to 130% of the flow produced by the original air delivery component. Justification for qualifying air delivery components with flows higher than 130% may be considered by the certification body based on sound engineering principles. Air delivery components with flows lower, or higher, than the stated range of 90% to 130% may be considered for qualification by the certification body based on system performance testing.~~

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8 Performance testing and evaluation

8.1 Preparations for testing and evaluation

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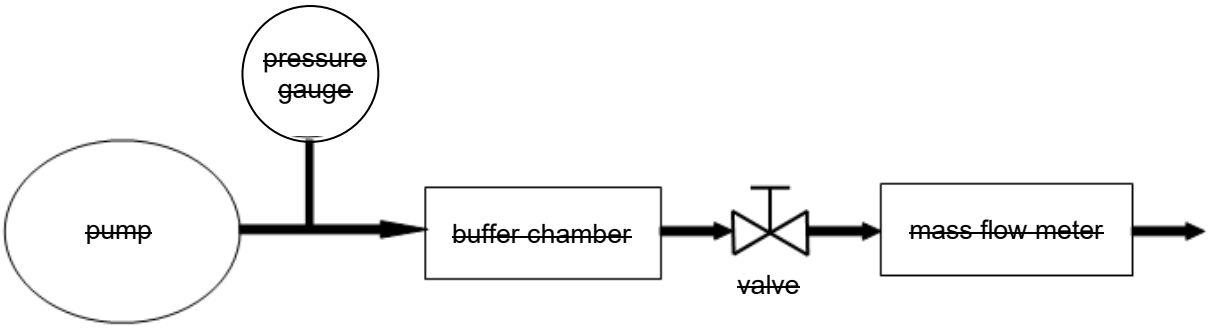
~~**8.1.8** Prior to initiation of design loading, the air delivery component (if one is utilized) – either air compressor or blower – shall be connected to the system and run for a minimum of 4 h. Air pressure shall be measured by a pressure gauge installed near the exhaust port of the air delivery component and that reading recorded.~~

~~**8.1.9** When it is not possible to measure pressure on the system under test, the measurement may be completed with a separate air delivery component plumbed to a different tank. All plumbing and air distribution components used in the tested system shall be installed with the air delivery component. Potable water or wastewater shall be used. Air distribution outlets or diffusers shall be located at the same depth as in the tested system. The air delivery component shall be run for a minimum of 4 h. Air pressure~~

~~shall be measured by a pressure gauge installed near the exhaust port of the air delivery component and that reading recorded.~~

~~**8.1.10** Following the pressure measurement, a separate air delivery component shall be tested for flow. This air delivery component shall be plumbed into the rig diagrammed below. After adjusting the backpressure to the pressure measured in Sections 8.1.8 or 8.1.9, the air delivery component shall run for a minimum of 4 h. After the 4-h minimum run time, backpressure shall be adjusted if needed to match pressure measured in Sections 8.1.8 or 8.1.9 and then flow shall be measured and recorded.~~



~~Figure 1~~

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8.4 Analytical descriptions

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~~8.4.3 Pressure and flow~~

~~Air pressure shall be measured using a gauge with accuracy of 2% or better. Airflow shall be measured using a flow meter with accuracy of 10% or better.~~

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8.5 Criteria

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~~8.5.4 Air pressure and flow~~

~~There are no criteria for aerator pressure or flow. Pressure and flow are measured for the purpose of qualifying alternate aerators following the test.~~

NSF/ANSI Standard
For Wastewater Technology –

Residential Wastewater Treatment Systems – Nitrogen Reduction

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5 Design and construction

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8 Performance testing and evaluation

This section describes the methods used to evaluate the performance of residential wastewater treatment systems designed to remove nitrogen from residential wastewater. Performance testing and evaluation shall not be restricted to specific seasons.

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~~8.1.8~~ ~~Prior to initiation of design loading, the air delivery component (if one is utilized) – either air compressor or blower – shall be connected to the system and run for a minimum of 4 h. Air pressure shall be measured by a pressure gauge installed near the exhaust port of the air delivery component and that reading recorded.~~

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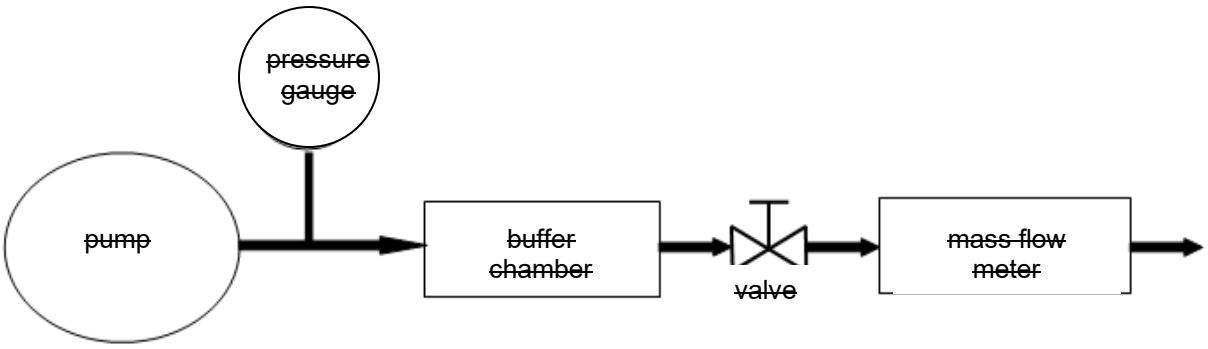

~~Figure 1~~

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8.3 Sample collection

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~~8.3.5 Pressure and flow~~

~~Air pressure shall be measured using a gauge with accuracy of 2% or better. Airflow shall be measured using a flow meter with accuracy of 10% or better.~~

8.4 Criteria

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~~8.4.4 Air pressure and flow~~

~~There are no criteria for aerator pressure or flow. Pressure and flow are measured for the purpose of qualifying alternate aerators following the test.~~

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NSF/ANSI Standard
for Wastewater Technology –

Onsite Residential and Commercial Water Reuse Treatment Systems

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5 Design and construction

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~~5.11 Alternate air delivery components~~

~~To ensure stabilized air flow conditions are met, proposed alternate air delivery components – either air compressors or blowers – that create air pressure shall be run for a minimum of 4 h at the system pressure recorded at the outset of the evaluation of the system as outlined in Sections 8.1.1.8, 8.2.1.8, and 8.5.2. The alternate air delivery components shall deliver flow in the range of 90% to 130% of the flow produced by the original air delivery component. Justification for qualifying air delivery components with flows higher than 130% may be considered by the certification body based on sound engineering principles. Air delivery components with flows lower, or higher, than the stated range of 90% to 130% may be considered for qualification by the certification body based on system performance testing.~~

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8 Performance testing and evaluation

The analytical methods listed in Table N-1.2 shall be used for testing. Alternate methods are permissible, provided equivalency is demonstrated by technical review and the review is documented. An equivalent method involves the same measurement technique. Equivalent methods are known to be capable of generating reliable results to equivalent quality requirements. All sample collection methods shall be in accordance with *Standard Methods*[Error! Bookmark not defined.] unless otherwise specified.

8.1 Greywater treatment systems with capacities up to 5,678 LPD (1,500 GPD)

This section describes the methods used to evaluate the performance of onsite residential and commercial greywater treatment systems that treat greywater, those that treat laundry water from residential laundry facilities, and those that treat bathing water. Systems shall be classified as Class R (single-family residential), or Class C (multi-family or commercial), in accordance with Section 8.6. The performance classification shall be based upon the evaluation of effluent samples collected over a minimum 6-mo (26-wk [182-d]) testing period. Manufacturers that recommend a service frequency longer than 6-mo (26-wk [182-d]) shall be tested for the full period of the recommended service frequency.

8.1.1 Preparations for testing and evaluation of greywater treatment systems

8.1.1.1 The system shall be assembled, installed, and filled in accordance with the manufacturer's

instructions.

8.1.1.2 Some greywater treatment systems provide a means to top off the treated water storage tank with potable water. This assures the user that water will always be available for the intended use. For performance testing, this feature shall be disabled. Some greywater treatment systems require a potable water connection to provide water for a backflush or other function. This feature may be active during performance testing, provided the volume of water used does not exceed 5% of the daily hydraulic capacity and a minimum 90% of the fresh water used in the process goes directly to waste. For example, fresh water could be used to flush the treated water storage tank every 5 d with the flush going to sewer. However, if this process results in more than 10% of the flush water remaining in the treated water storage tank, the feature shall be disabled during performance testing.

8.1.1.3 The manufacturer shall inspect the system for proper installation. If no defects are detected and the system is judged to be structurally sound, it shall be placed into operation in accordance with the manufacturer's start-up procedures. If the manufacturer does not provide a filling procedure, $^{2}/_{3}$ of the system's capacity shall be filled with water meeting the specifications of Section 8.1.2.1, and the remaining $^{1}/_{3}$ shall be filled with greywater meeting the specifications of Sections 8.1.2.1.1, 8.1.2.1.2, or 8.1.2.1.3, as appropriate, based upon manufacturer’s decision to test with bathing water, laundry water, or both.

8.1.1.4 The system shall undergo design loading (see Section 8.1.2.2.1) until testing and evaluations are initiated. Sample collection and analysis shall be initiated within 3 wk (21 d) of filling the system and, except as specified in Section 8.6.1.2, shall continue without interruption until the end of the evaluation period.

8.1.1.5 If the system is to be installed outdoors, and conditions at the testing site preclude installation of the system at its normally prescribed depth, the manufacturer shall be permitted to cover the system with soil to achieve normal installation depth.

8.1.1.6 If the system is to be installed outdoors, performance testing and evaluation of systems shall not be restricted to specific seasons.

8.1.1.7 When possible, electrical or mechanical defects shall be repaired to prevent evaluation delays. All repairs made during the performance testing and evaluation shall be documented in the final report.

8.1.1.8 The system shall be operated in accordance with the manufacturer’s instructions. Routine service and maintenance of the system shall not be permitted during the performance testing and evaluation period. Routine refilling or topping off of disinfection device reservoirs, such as tablet or liquid chlorinators or other similar disinfection devices, is permissiblie once every 30 d and shall be documented in the final report.

It is permissible for the manufacturer to recommend or offer more frequent service and maintenance of the system, but for the purpose of performance testing and evaluation, service and maintenance shall not be performed beyond what is specified in this standard.

8.1.1.10 ~~Prior to initiation of design loading, the air delivery component (if one is utilized) – either air compressor or blower – shall be connected to the system and run for a minimum of 4 h. Air pressure shall be measured by a pressure gauge installed near the exhaust port of the air delivery component and that reading recorded. Then the air compressor or blower component shall be disconnected from the system and the air flow measured at the system pressure and recorded.~~

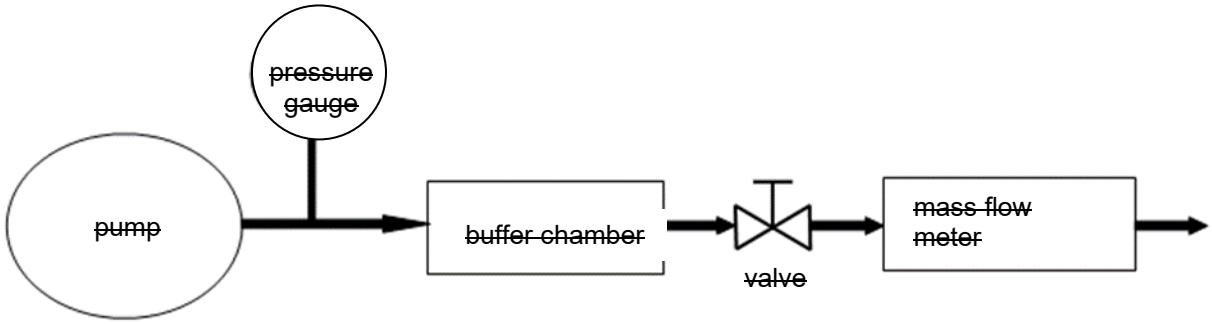

Figure 1

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8.2 Residential wastewater treatment systems with capacities up to 5,678 LPD (1,500 GPD)

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8.2.1.8 Prior to initiation of design loading, the air delivery component (if one is utilized) – either air compressor or blower – shall be connected to the system and run for a minimum of 4 h. Air pressure shall be measured by a pressure gauge installed near the exhaust port of the air delivery component and that reading recorded. Then the air compressor or blower component shall be disconnected from the system and the air flow measured at the system pressure and recorded.

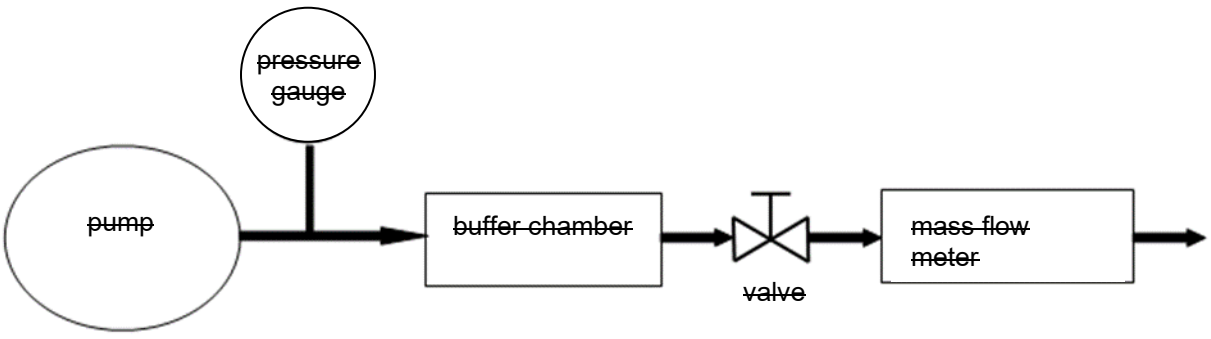

Figure 2

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8.5 Analyses (applicable to all reuse systems evaluated in accordance with Sections 8.1, 8.2, and 8.3)

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~~**8.5.2 Pressure and flow**~~

~~Air pressure shall be measured using a gauge with accuracy of 2% or better. Airflow shall be measured using a flow meter with accuracy of 10% or better.~~

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8.6 Criteria (applicable to all reuse systems evaluated in accordance with Sections 8.1, 8.2, and 8.3)

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~~**8.6.2 Air pressure and flow**~~

~~There are no criteria for aerator pressure or flow. Pressure and flow are measured for the purpose of qualifying alternate aerators following the test.~~