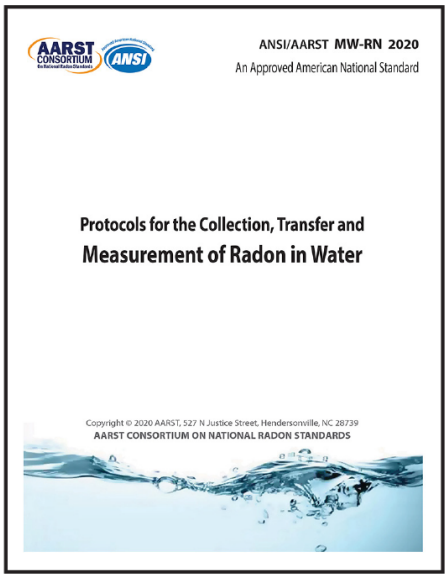
Public Review of MW-RN 202x Revisions

Protocol for the Collection, Transfer and Measurement of Radon in Water

Consistent with plans relative to our continuous maintenance program, the attached proposed revisions to ANSI/AARST MW-RN 2020 are being published for public review. This public review is intended to solicit comments that will lead to improvements in upcoming publications.



ANSI/AARST standards are available for review and for purchase at www.standards.aarst.org. A link to ensure you receive future public review notices can be found at www.standards.aarst.org/public-review.

Public Review: MW-RN 202x addenda 25-7

COMMENT DEADLINE: **September 8th 2025**

REQUESTED PROCESS AND FORM FOR FORMAL PUBLIC REVIEW COMMENTS

Submittals (MS Word preferred) may be attached by email to Standards@aarst.org

1) Do not submit marked-up or highlighted copies of the entire document.

2) If a new provision is proposed, text of the proposed provision must be submitted in writing. If modification of a provision is proposed, the proposed text must be submitted utilizing the strikeout/underline format.

3) For substantiating statements: Be brief. Provide abstract of lengthy substantiation. (If appropriate, full text may be enclosed for project committee reference.)

REQUESTED FORMAT

Public Reviewed Item and Its Date: MW-RN 202x

- **Name:** Affiliation:
- **Clause or Subclause**:
- **Comment/Recommendation**:
- **Substantiating Statements**:

Repeat the four bullet items above for each comment.

AARST Consortium on National Standards

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The Consortium Consensus Process

The consensus process developed for the AARST Consortium on National Radon Standards and as accredited to meet essential requirements for American National Standards by the American National Standards Institute (ANSI) has been applied throughout the process of approving this document.

Continuous Maintenance

This standard is under continuous maintenance by the AARST Consortium on National Standards for which the Executive Stakeholder Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard.

User Tools: User tools are posted online (www.standards.aarst.org/public-review) as they become available (such as templates for field notices, inspection forms, interpretations and approved addenda updates across time).

Notices

Notice of right to appeal: Bylaws for the AARST Consortium on National Standards are available at www.standards.aarst.org/public-review. Section 2.1 of Operating Procedures for Appeals (Appendix B) states, "Persons or representatives who have materially affected interests and who have been or will be adversely affected by any substantive or procedural action or inaction by AARST Consortium on National Standards committee(s), committee participant(s), or AARST have the right to appeal; (3.1) Appeals shall first be directed to the committee responsible for the action or inaction."

TOPIC 1 SCOPE LIMITATIONS

These revisions speaks to authorities having jurisdiction

1.2 Limitations

1.2.3 ~~While this consensus document provides current best practices, individual states may require alternate sample collection, transport, preparation, and/or analysis procedures.~~

Adherence to this standard does not guarantee or supersede compliance with regulations of any federal, state, or other authority having jurisdiction (AHJ) ~~local agency with jurisdiction~~ where testing is performed. Some states have a program that certifies laboratories or requirements for accreditation by a private sector proficiency program [1] to help ensure quality assurance is addressed for analytical methods. While this consensus document provides current best practices, individual states may require alternate sample collection, transport, preparation, and/or analysis procedures.

Footnote

[1] The National Environmental Laboratory Accreditation Program (NELAP) is an example of private sector programs recognized by some jurisdictions in the United States for accrediting laboratories.

Note—Identification of any private sector accreditation organization in this standard is not an endorsement of said programs.

TOPIC 2 TERMS

These revisions speak to correcting definitions

Continuous Radon Monitor (CRM): An electronic device that (1) is capable of automatically recording a retrievable time series of numeric measurements of radon concentration averaged over time intervals of 1 hour or less; (2) has a *minimum detectable concentration (MDC)* of no greater than 148 Bq/m^3 (4 pCi/L) for a 1-hour measurement; and (3) has a *calibration factor* of at least 2 counts per hour per 37 Bq/m^3 (0.054 counts per hour [cph] per Bq/m^3 or 2 cph per pCi/L).

~~Continuous Radon Monitor (CRM): An electronic device with adaptations that can provide numeric measurements of radon concentration in a water sample.~~

Duplicates: Two identical samples collected at the same time, using the same procedures and ~~tested~~ analyzed separately. Duplicate samples are used to evaluate collection and measurement precision.

TOPIC 3 HOMEOWNER INSTRUCTIONS AND DIRECT FILL METHOD

These revisions speak to addressing common test events by homeowners or untrained inspectors.

SECTION 3.0 COLLECTING SAMPLES (CITIZENS)

3.1 Instructions

Water sample kits sold to homeowners and other untrained individuals for the submerged bottle and direct-fill collection methods **shall** include instructions provided in Exhibit 3.1, or equivalent instructions.

For other water sample collection methods relative to laboratory or professional use, practices shall comply with normative Annex A *(Field Professional Operations)* and B. *(Other Approved Collection Methods)*.

Exhibit 3.1 Collecting Radon in Water Samples

It is vitally important to minimize aeration of water when you collect each sample.
If care is not taken to minimize aeration of the water, test results may not be accurate. Aeration happens when air mixes with water, which releases radon from the water. For example, most kitchen faucets feature a fitting or nozzle at the end of the spout known as an aerator. Bathroom faucet spouts often have a smaller fitting that contains a wire screen. As water passes through these nozzles, air circulates and mixes into the stream of water.

Which faucet do I use?
Look for a convenient cold-water faucet that either has no aerator nozzle or has a nozzle that can be removed. Bathroom tub faucets and utility water spigots, outside and inside, often do not have aerating nozzles or screens. A faucet adapter with a short hose can sometimes make things easier.

If you can't find a suitable faucet, consider hiring a professional instead of taking a test result may not be accurate.

Note—

a) If no mitigation system is present, collect two samples from the same water faucet. or

b) If a mitigation system is active, first collect a water sample from a tap that delivers water already treated by the mitigation system. Then collect a second sample that has not been treated by the mitigation system.

Step 1
Fully open cold-water taps to discard water from piping and well-water holding tanks:

(a) at the faucet chosen for collecting the water sample; and

(b) at a bathtub or at utility spigots (outdoors or indoors) that deliver water faster (such as 5 gallons per minute) compared to a single faucet. If not available, open several faucets.

Discard water for up to 20 minutes to obtain fresh well water at the faucets. Water used earlier in the day for other purposes can be included as part of the 20 minutes.

Step 2
Close the faucets and then slowly open the faucet you have chosen for taking the water sample until you begin to see a steady stream of water. The water must flow into collection containers without air mixing into the stream of water. You need a gently flowing stream of water that takes about 30 seconds to fill a cup.

Step 3 Collection Methods

Submerged Bottle method

(a) Start filling the bowl or bucket slowly. Let the water flow gently against the sides of the container. Avoid splashing or creating bubbles.

Fill the bowl or bucket until it is deep enough for your hands to hold the bottle and its cap below the water's surface.

To fill the container faster, once the water is deep enough, you may submerge the faucet spout or a connected hose and slowly open the faucet a bit. Be careful that this does not agitate the water.

(b) Remove the screw cap from the bottle. Slowly submerge the bottle and cap without creating bubbles. Then, cap the bottle while it is underwater.

(c) Remove the bottle from the water. Turn the sealed bottle upside down to check for air bubbles. If you see a bubble, empty the bottle and repeat these steps.

Note to reviewers: It is intended that these pictures be replaced/improved.

Direct-fill method

(a) Remove the screw cap from the bottle.

(b) Filling the bottle

1 Tilt and slide the open end of the bottle 1/2 inch (1-2 cm) under the faucet spout. The water must flow gently against the sides of the bottle and not splash or create bubbles.

2 Once mostly full, hold the bottle completely upright and let it overflow for 10 to 15 seconds.

3 Then slide the bottle away from the water stream, making sure there is a slight “bulge” of water standing above the rim of the bottle.

(c) Quickly confirm the slight “bulge” of water. Then position the cap on the bottle and tighten it.

(d) Turn the sealed bottle upside down to check for air bubbles. If you see a bubble, empty the bottle and repeat these steps.

If you cannot get a bubble-free sample, try the submerged bottle method. You can also hire a professional instead of taking a sample that may not be accurate.

Step 4

Follow laboratory instructions for filling in forms and shipping samples to the laboratory. Prompt return must be in accordance with laboratory requirements.

3.2 Documentation

Forms for homeowners and other untrained individuals shall be provided with test kits that are consistent with content described in Section 4 for documenting the water collection event .

TOPIC 4 CONTENT ORDER

These revisions reorganize sections as a result of Section 3 repurposing and moving seldom used water collection methods in the standard to a Normative Annex.

SECTION 4.0 FIELD PROFESSIONAL OPERATIONS— PREPARE FOR COLLECTING WATER SAMPLES

~~**SECTION 4.0 FIELD OPERATIONS— LOCATIONS FOR COLLECTING WATER SAMPLES**~~

SECTION 5.0 FIELD PROFESSIONAL OPERATIONS—SAMPLE COLLECTION

SECTION 6.0 FIELD PROFESSIONAL OPERATIONS— HANDLING WATER SAMPLES

ANNEX A OTHER APPROVED COLLECTION METHODS

TOPIC 5 FOR ANNEX A BUT PREVIOUSLY IN SECTION 5.5.2 UPRIGHT FUNNEL

For editorial clarity

(5) Fill the bottle only with water coming out of **the attached tubing** of the funnel stem.

TOPIC 6 PRE- AND POST-MITIGATION TESTING

These revisions speak to establishing and clarifying different requirements for pre-mitigation compared to post-mitigation testing

5.1 Collection methods

5.1.1 All water samples shall be collected using only the methods described herein, or as approved by a state or nationally-recognized certification program.

5.1.2 A hose greater than ½" (1.25 cm) diameter and longer than 24" (60 cm) shall not be used.

5.1.3 Sample bottles shall not be filled directly from or in contact with the faucet spigot.

5.2 Take the sample(s) immediately after flushing water lines or holding tanks

The sample(s) shall be collected immediately following the purging of water from piping and tanks in accordance with Section 4.

5.3 Duplicate samples required (Pre-mitigation)

All water samples for radon determination where no mitigation system is present or active shall be collected in *duplicate*.

Note—Collection (and analysis) of *duplicate* samples serves to:

a) confirm results for decisions regarding mitigation; and

b) provide a *QC* check of the reproducibility regarding the collection, transfer, and analysis methods.

5.3.1 *If a single sample was collected*

In the event only a single sample was collected or for unforeseen circumstances one is found suitable for analysis and the concentration is below 20,000 pCi/L (740 Bq/L), a sequential sample shall be collected within 2 weeks of the initial sampling. Flushing of the water line shall be identical each time. Sequential sampling shall be documented with the date and time of collection for both water samples. Both individual results and an average shall be reported unless State guidance differs.

Note—While decisions to mitigate are not prohibited at any time, comprehensive testing provides confidence that decisions are not being made based on inconclusive or inconsistent collections or measurements.

5.4 Post-mitigation testing

Procedures for initial and future evaluations for the effectiveness of radon in water mitigation systems shall include collecting not less than:

a) one sample from a water tap located after all water treatment equipment, and then

b) one well water sample at a tap prior to mitigation equipment.

TOPIC 7 EDITORIAL CLARITY

This revision speaks to removal of a sentence that is found to confuse readers.

7.2 Consideration for retesting when two test results disagree

7.2.1 *Acceptable*

When two water samples were collected the same time and location, the average of the two test results is to be used for determining needs for mitigation if:

a) both test results are above the action level, or

b) both test results are below the action level.

Note—Some variation between *duplicate* sample results is typical. ~~However, if the variation between *duplicate* results is unusually large, it might indicate problems in the collection process~~.

TOPIC 8 POST-MITIGATION TESTING

These revisions speak to clarifying procedures several details relative to test conditions when testing larger buildings

7.4 Post-mitigation testing

~~7.4.1 *Initial testing to confirm effectiveness of mitigation efforts*~~

~~Evaluation for the effectiveness of applied remediation of radon in a water supply is best achieved through measurement of both untreated and treated samples.~~

Upon completion of mitigation system installation and with ongoing maintenance and monitoring events in the future, the procedure shall include both testing the mitigated water after all water treatment equipment and then testing the water source prior to water mitigation equipment, as required in Section 5.4. The exact location of the spigot(s), date and time, collection method, and other pertinent information shall be recorded.

~~7.4.2 *Post-mitigation test locations*~~

~~The post-mitigation test locations and procedures shall meet all the requirements of Sections 4 with the post-mitigated water samples collected at a location that is prior to other water treatment equipment. The exact location of the spigot(s), date and time, collection method, and other pertinent information shall be recorded.~~

TOPIC 9 PROFESSIONAL SAMPLE COLLECTOR

These revisions speak to clarifying language relative to notifying staff who work at the buildings being tested.

SECTION 9.0 PROFESSIONAL SERVICES—QUALIFIED SAMPLE COLLECTORS

9.1 Defined

For professional services, ~~only a~~ water samples for radon shall be collected by a Qualified Sample Collector. ~~accredited by statute, state licensure or nationally recognized certification program shall collect a water sample for radon.~~ For the purposes of this document, a "Qualified Sample Collector" is defined as a person who:

~~a) has received demonstrated a minimum degree of appropriate training and has demonstrated technical knowledge and skills by way of an exam sufficient to collect accurate samples in accordance with this standard and implement quality procedures when collecting radon in water samples in homes:~~

~~a. as established by private testing labs or *proficiency programs* that are recognized by state or federal health authorities; or~~

~~b. as established by licensure or certification programs operating under an authority having jurisdiction (AHJ).~~

a) has received training on water collection methods and quality procedures required in this standard and has passed an examination to demonstrate technical knowledge and skills needed for collecting radon in water samples in homes:

c. as established by private *proficiency programs* or by private testing labs that are accredited or licensed for lab services by state or federal authorities; or

d. as established by licensure or certification programs operating under an authority having jurisdiction (AHJ).

~~a) has satisfactorily completed a water measurement training course accredited by a national certification program such as the National Radon Proficiency Program (NRPP) or the National Radon Safety Board (NRSB); or as recognized by state licensure or certification program;~~

b) collects water samples in accordance with this standard with measurement results derived from sample analysis services provided by a Qualified Laboratory; and

c) establishes and maintains a quality assurance management system for the tasks they perform that monitors and controls the quality of test devices and testing procedures.

~~If available or where applicable, this definition includes "An individual that has demonstrated a minimum degree of appropriate technical knowledge and skills specific to the collection of radon in water samples:~~

~~a) as established by a national certification program such as the National Radon Proficiency Program (NRPP) or the National Radon Safety Board (NRSB); or~~

~~b) as required by statute, state licensure or certification program."~~

9.2 Quality assurance required for field operations

Each *qualified sample collector* shall be responsible for developing, documenting and implementing their own procedures for defensible *quality control* processes and assessments within the context of their own operation's quality management system.