

# CHAPTER 240. RADON CERTIFICATION

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## Subchapter A. GENERAL PROVISIONS

### GENERAL

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### GENERAL

#### § 240.1. Description of regulatory structure.

- (a) The act directs the Department to establish a Radon Certification Program. This chapter specifies the requirements to certify a person to test for and mitigate radon contamination of occupied buildings and to analyze radon samples. Persons exempt from certification are specified in § 240.2 (relating to scope).
- (b) Subchapter B (relating to certification) specifies the requirement that a person shall be certified to conduct radon testing, and the requirements for obtaining certification. Subchapter B also contains the requirements for certification in mitigation and laboratory analysis.
- (c) Subchapter C (relating to certification review procedures and standards) provides the standards and procedures for review of applications, renewal and modification of certification.
- (d) Subchapter D (relating to operation requirements) contains operation requirements for certified persons who conduct radon-related activities. Subchapter D includes the requirements concerning advertising, notice to clients and disclosure of radon information to the Department. These operation requirements are in addition to specific requirements contained in a certification.

(e) Subchapter E (relating to enforcement and decertification) contains the enforcement provisions, including inspection, decertification and assessment of civil penalties. Other enforcement actions are available under sections 308 and 309 of the Radiation Protection Act (35 P. S. §§ 7110.308 and 7110.309) and section 14 of the act (63 P. S. § 2014).

(f) **[Subchapter F (relating to interim certification) specifies the requirements for persons certified under the Department's Interim Certification Program.**

(g) [This section is for descriptive purposes only. This section does not limit the authority of the Department under the acts or this chapter.

## **§ 240.2. Scope.**

**(a)** This chapter applies to all persons except a person:

(1) Testing for or mitigating against radon contamination in a building that the person owns or **[occupies] in which the person resides.**

(2) Using measures designed to prevent radon contamination in newly constructed buildings. This exemption does not apply to radon testing or installation of radon mitigating devices in these buildings following occupancy.

(3) Performing testing or mitigation in the course of the person's normal duties as an employee or contractor of the Department or the Federal government.

(4) Performing **Department-approved** scientific research if the person discloses the information obtained to the Department under § 240.303 (relating to reporting of information) and the person informs the owner or occupant of the affected building of the following:

(i) That the person is not certified by the Department to test for or mitigate against radon contamination.

(ii) That the test results are not **[certified] valid.**

(iii) That the mitigation methods are for experimental purposes and may be unsuccessful.

**(5)** Purveying **[, but not placing, or retrieving passive] secondary [radon testing] devices [such as charcoal canisters or track etch monitors] supplied by a certified laboratory, if radon concentrations determined by the laboratory are **only** reported directly to the owner or **[occupier] resident** of the building tested.**

**(i)** **Test results may also be reported to the certified mitigator who installed a mitigation system at the property.**

(ii) Purveying does not include the activities of either placing or retrieving radon testing devices.

(6) Employed by a local government or a school who performs testing for that local government or school if all of the following criteria are met:

(i) The practice is limited to the employee's official duties and no fee is charged for the testing except for the employee's salary.

(ii) All testing is performed using a secondary device which the employee places and retrieves and which is analyzed by a Department-certified laboratory.

(iii) Proof of successfully completing a Department-approved School/Large Building Course is submitted to and approved by the Department.

(iv) A quality assurance plan (including all sites to be tested) is submitted to and approved by the Department prior to commencing testing. The Department-approved quality assurance plan must be followed.

(v) Radon testing is limited to the buildings the local government or school owns or occupies.

(b) This chapter is in addition to, and not in substitution for, other applicable provisions of this article.

### § 240.3. Definitions.

The following words and terms, when used in this chapter, have the following meanings, unless the context clearly indicates otherwise:

**AC - activated charcoal**—A device used to measure radon by exposing activated charcoal to air in the area to be tested.

**ALARA—As Low As Reasonably Achievable. Making every reasonable effort to maintain exposures as far below the dose limits as is practical, taking into account economic considerations and other societal concerns.**

**AT- alpha track**—A device used to measure radon by recording alpha particle tracks on a plastic chip.

*Act*—The Radon Certification Act (63 P. S. §§ 2001—2014).

*Acts*—The Radon Certification Act and the Radiation Protection Act (35 P. S. §§ 7110.101—7110.703).

**Alteration**—A change to the original mitigation system design, including but not limited to fan size, number or placement of suction points or pipe diameter.

**Blind study** —A study in which the certified person’s device is exposed to a specific radon concentration that is unknown to the certified person.

**Calibration--** The process of determining the response of an instrument (or measurement system) to a series of known values over the range of the instrument (or measurement system).

**CRM - continuous radon monitor** —An active device used to measure radon with solid state silicon surface barrier detectors, scintillation cells, or ion chambers, usually on an hourly basis.

**CWLM - continuous working level monitor** — An active device used to measure radon decay products, usually on an hourly basis.

**Certification year**—Each 12-month period beginning with the most recent certification date of the certified individual.

**Certified individual**—An individual with a Department certification to perform radon testing, mitigation, or laboratory analysis in this Commonwealth.

**Client** —A receiver of services that are regulated under the Act or this chapter.

**Control limit**—A quality control value set at plus or minus three sigma.

**Diagnostic test**—A test performed to determine specific radon entry points and sources the result of which is not reported to the Department or not reported in writing to the client.

**Duplicate measurements**—Two measurements made concurrently, for the same time period and in the same location, approximately four inches from one another.

**Electret ion chamber**—A radon measurement device that consists of a small plastic container with an electrostatically charged disk inside to serve as a detector.

**Electret reader**—A radon measurement device that consists of a voltmeter used to measure the voltage on the electrostatically charged disk of an electret ion chamber testing device at the beginning and end of a test period.

**Electret voltage drift** —A quality control process which evaluates the voltage drift of each new batch of electrets received from the manufacturer of the electrets.

**Field blank**—A quality control measurement made by analyzing unexposed (closed) detectors that have been maintained in a low radon environment to assess radon

**exposure to the detector from a source other than the concentration in the environment to be measured.**

**Firm**—[a person, other than an individual] **A Department-certified entity that has one certified individual in responsible charge of the entity's testing, mitigation, or laboratory radon activities.**

**Firm employee**—**A Department-listed radon testing, mitigation or laboratory employee under the responsible charge of a certified individual.**

**Firm owner**—**A person or business entity which owns the radon firm.**

**Laboratory**—**A Department-certified laboratory individual or firm.**

**Laboratory analysis**—[The act of determining radon concentrations in air, water, soil or passive radon testing devices]. **The act of analyzing a radon test device and calculating a radon concentration in air or water.**

**LS - liquid scintillation**—**A device used to measure radon by exposing a small amount of activated charcoal contained within a small vial and placed in the area to be sampled.**

**Lowest livable level**—**The lowest level of a building that may be used as a living space without requiring any major structural changes.**

**MV - measured value** —**The radon concentration reported by the analyst, in units of picocuries per liter or working levels.**

**Measurement**—**A radon or radon decay product test result used for the performance of quality assurance, including a spike, blank, duplicate, intercomparison, or cross check.**

**Mitigate**—To repair or alter a building or building design for the purpose in whole or in part of reducing the concentration of radon in the indoor atmosphere.

**Mitigator**—**A Department-certified mitigation individual or a Department-listed mitigation employee of a Department-certified mitigation firm.**

**Multifamily building**—**A building with more than three attached dwellings.**

**Non-reported test**—**A test conducted for reasons other than reporting valid, written results to the client, for example a diagnostic test.**

**pCi/L—picocurie per liter**—**2.22 disintegrations per minute of radioactive material per liter of air.**

*Person*—An individual, corporation, partnership, **business entity**, association, trust, estate, public or private institution, group, agency or political subdivision of this Commonwealth, another state or political subdivision or agency thereof, and a legal successor, representative, agency or agency of the entities listed in this definition.

***[Picocurie per liter—2.22 disintegrations per minute of radioactive material per liter of air.]***

*Primary device*—Continuous monitors or [electrets] **electret ion chambers**, or both, read or analyzed, or both, by a primary tester.

*Primary tester*—A tester who reads or analyzes, or both, [the continuous monitors or electrets, or both,] **a primary device** that the tester places or retrieves, or both.

***RPD—relative percent difference—The absolute value of the difference between two measurements divided by their average, multiplied by 100. In other words,  $RPD = \frac{|(MV_1 - MV_2)|}{(MV_1 + MV_2)/2} \times 100$ .***

***RPE—Relative percent error—The measured value (pCi/L) minus the reference value (pCi/L), divided by the reference value, multiplied by 100. In other words,  $RPE = \frac{(MV - RV)}{RV} \times 100$ .***

***RV—Reference value—The known radon concentration value, in units of picocuries per liter or working level, to which a test device is exposed.***

*Radon*—The radioactive noble gas Radon-222 and the short-lived radionuclides which are products of Radon-222 decay, including polonium-218, lead-214, bismuth-214 and polonium-214.

***Secondary device—A radon test device that is analyzed by a Department-certified laboratory.***

***Secondary tester—A tester who places or retrieves, or both, a radon test device that is analyzed by a Department-certified laboratory.***

***Sigma level—A sample standard deviation around a mean, which is a measure of the scatter of data around a mean. The term is often described as one, two or three sigma, corresponding to one, two, or three standard deviations around the mean.***

***Spiked measurement (spike)—A quality control measurement conducted to evaluate accuracy by exposing the detector or device to a known concentration and submitted for analysis.***

*Test*—The act of [examining] **measuring for the presence of radon in** a [building , soil,] **building's air** or water **supply**. [for the presence of radon, including taking air, soil or

water samples, or the act of diagnosing the cause of radon contamination in a building.]

**Tester—A Department-certified testing individual or a Department-listed testing employee of a Department-certified testing firm.**

**WL—working level—[One working level is that amount of potential alpha-particle energy dissipated in one liter of air by the short-lived daughters in equilibrium with 100 pCi/l of Radon-222. One WL is equal to 130,000 Mev of potential alpha-particle energy deposited per liter of air.] Any combination of short-lived radon progeny (for radon-222: polonium-218, lead-214, bismuth-214, and polonium-214; and for radon-220: polonium-216, lead-212, bismuth-212, and polonium-212) in 1 liter of air that will result in the ultimate emission of  $1.3 \times 10^5$  MeV of alpha particle energy.**

**WLM—working level month —The cumulative exposure from breathing an atmosphere at a concentration of 1 WL for a working month of 170 hours.**

**WLM/yr—working level month per year—The cumulative exposure incurred over 1 year (2040 hours) from breathing an atmosphere at a concentration of 1 WL for a working month of 170 hours.**

**Warning level—A quality control value set at plus or minus two sigma.**

## Subchapter B. CERTIFICATION

### CERTIFICATION FOR RADON TESTING

Sec.

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#### **CERTIFICATION FOR RADON TESTING**

##### **§ 240.101. [Requirement] Requirements for radon testing certification.**

**(a)** A person may not test for radon or represent or advertise that he may so test in a building [or building lot] in this Commonwealth, unless the person has first applied for and obtained certification **from the Department** to test **or is Department-listed as a firm employee of a certified testing firm.**

**(b)** For a firm to perform radon testing it shall employ [at least] one [person] **individual** certified to test, and the firm shall submit an application for certification **and receive certification from the Department.**

**(c)** Not [everyone] **every individual** within the firm is required to be certified to test. [An individual performing testing and not working for a certified radon testing firm shall obtain radon testing certification prior to performing testing. ]

**(d)** **A certified primary tester does not also have to become certified in radon laboratory analysis to read or analyze continuous monitors or electret ion chambers that he or she places and retrieves.**

**(e)** A person using [passive radon monitors] **secondary radon testing devices**, such as **activated** charcoal [canisters], from a certified radon laboratory does not also have to become certified in radon laboratory analysis.

##### **§ 240.102. Prerequisites for radon testing certification.**



(a) *Individual certification for radon testing.* An individual will not be certified to test unless the individual has **[done the following]:**

- (1) **[Taken] Completed** a Department-approved course on radon.
- (2) **[Taken and passed] Passed** a Department-approved written exam on radon testing **within 2 years before the postmark date of the individual's application submittal.** The applicant shall forward **[an official] a** copy of exam results to the Department.
- (3) **[Had 1 year of professional experience in performing radon measurements or equivalent as determined by the Department.]**
- (4) Submitted a complete and accurate application to the Department, including applicable fees.

(b) *Firm certification for radon testing.* If the applicant for testing certification is a firm, it shall employ **[at least]** one individual who is certified to test and who is in responsible charge of the firm's testing activities. **[If the firm loses its certified individual, the certification automatically lapses and is void until the firm has notified the Department of employment of another certified individual. Within 5 days the firm shall notify the Department in writing when it loses its certified individual. Each testing firm employee, after the first initial testing firm employee, will be charged a fee as set forth in Appendix A (relating to radon certification fee schedule).]**

**(1) The firm owner shall notify the Department in writing within 5 days of losing its testing certified individual. When the firm loses its testing certified individual, the firm's certification automatically lapses and is void until the Department approves in writing the firm owner's written and signed request for a certified individual to be in responsible charge of that firm's radon testing activities.**

**(2) A testing certified individual may not also be a testing firm employee.**

**(3) If a testing firm employee is no longer under the responsible charge of the testing certified individual, then the firm employee's Department listing becomes invalid.**

**(4) The testing certified individual shall notify the Department within 5 days of when a firm employee is no longer under the responsible charge of the testing certified individual.**

**(5) A testing firm may list a maximum of five testing firm employees at one time.**

**(6) Each testing firm employee shall conduct activities in accordance with the signed testing firm employee application.**

**(7) Each testing firm employee applicant shall submit:**

**(i) A nonrefundable fee as set forth in Appendix A (relating to radon certification fee schedule).**

**(ii) A completed firm employee application as provided by the Department.**

- (iii) Proof of passing a Department-approved radon measurement exam.**
- (iv) The applicant's current photograph, in a format specified by the Department, to be used on the identification card as required in § 240.142 (relating to testing and mitigation identification cards).**
- (8) The testing certified individual must receive written approval from the Department before the testing firm employee may conduct radon testing activities.**

(c) *Additional requirements.* If the applicant for testing certification is a firm, or an individual performing testing and not working for a certified radon testing firm, the applicant shall also have a quality assurance program, a health and safety program and a continuing education program as required in §§ 240.304—240.307. In addition, the applicant shall be successfully enrolled in **[the EPA] a Department-approved** radon measurement proficiency program **[or equivalent]** as required in §§ 240.304—240.307.

### **§ 240.103. Radon testing application contents.**

**(a)** An application for radon testing certification, by **[both]an individual or a firm,** shall be submitted to the Department in writing on forms provided by the Department and must contain:

(1) Evidence that the applicant has the certification prerequisites in § 240.102 (relating to prerequisites for radon testing certification). **[, including the services offered and experience in each. If the applicant is a firm, the]****The** application must **[also]** include the duties assigned to the certified individual **in responsible charge of the testing activities.**

(2) A nonrefundable fee as set forth in Appendix A (relating to radon certification fee schedule).

(3) The applicant's name, address, **[and]** telephone number **and, if the applicant is an individual, the applicant's date of birth.** It must also indicate if the applicant is an individual, partnership, limited partnership, corporation or other entity. The application must include, when appropriate, the name and address of every officer, general and limited partner, director, principal shareholder, parent corporation and certified person within the applicant's organization.

(4) Compliance information, including descriptions of notices of violation, administrative orders, civil penalty assessments and actions for violations of the act, this chapter or a term or condition of a certification.

(5) Copies of reporting forms, information distributed to potential clients and recent **or proposed** advertisements.

**(6) The applicant's current photograph, in a format specified by the Department, to be used on the identification card as required in § 240.142 (relating to testing and mitigation identification cards).**

**[6] (7)** Other information the Department may require related to an applicant's qualifications or technical or administrative information related to radon testing.

[7] **(8)** A verification by **[a responsible official of]** the applicant that the information contained in the application is correct to the best of the **[official's] applicant's** information and belief. **This verification shall be subject to the penalties of 18 Pa.C.S. § 4904.**

**(b) Within 10 days of a change to the information submitted in the testing certified individual application or firm certification application, the testing certified individual shall submit to the Department a written and signed notification listing each change. The change may not take effect until the Department provides written approval of the change.**

#### **§ 240.104. Application filing deadline.**

A person who expects to conduct radon testing shall file a complete application for certification a minimum of 30 days prior to the anticipated starting date of testing activity. **[and any] A testing individual certification renewal** application postmarked after the **previous testing individual** certification expiration date will be charged a late application fee as set forth in Appendix A (relating to radon certification fee schedule).

### **CERTIFICATION FOR RADON MITIGATION**

#### **§ 240.111. Requirements for radon mitigation certification.**

**(a)** A person may not mitigate radon contamination in a building or represent or advertise that he may so mitigate in a building **[or building lot]** in this Commonwealth, unless the person has first applied for and obtained certification **from the Department** to mitigate **or is Department-listed as a firm employee of a certified mitigation firm.**

**(b)** For a firm to perform radon mitigation it shall employ **[at least] one [person] individual** certified to mitigate, and the firm shall submit an application for certification **and receive certification from the Department prior to performing mitigation of radon contamination.**

**(c)** Not **[everyone] every individual** within the firm is required to be certified to mitigate.

**(d) Prior to performing mitigation of radon contamination, a person [An individual performing mitigation and not working for a certified radon mitigation firm] shall obtain either radon mitigation individual certification or Department-listing as an employee of a mitigation firm [prior to performing mitigation of radon contamination].**

#### **§ 240.112. Prerequisites for radon mitigation certification.**

**(a)** *Individual certification for radon mitigation.* An individual will not be certified to mitigate unless he has **[done the following]:**

**(1) [Taken] Completed** a Department-approved course on radon mitigation.

- (2) **[Taken and passed] Passed** a Department-approved written exam on radon mitigation **within 2 years before the postmark date of the individual's application submittal**. The applicant shall forward **[an official] a** copy of exam results to the Department.
- (3) Had 1 year professional **[experience or supervised]** experience in radon mitigation system installation or 3 years experience in architecture, engineering, electrical contracting, plumbing, carpentry, masonry or related trades.
- (4) Submitted a complete and accurate application to the Department including applicable fees.
- (b) *Firm certification for radon mitigation.* If the applicant for mitigation certification is a firm, it shall employ **[at least]** one individual who is certified to mitigate and who is in responsible charge of the firm's mitigation activities. **[If the firm loses its certified individual, the certification automatically lapses and is void until the firm has notified the Department of employment of another certified individual. Within 5 days the firm shall notify the Department in writing when it loses its certified individual.]**
- (1) **The mitigation firm owner shall notify the Department in writing within 5 days of losing its mitigation certified individual. When the firm loses its mitigation certified individual, the firm's mitigation certification automatically lapses and is void until the Department approves in writing the mitigation firm owner's written and signed request for a certified individual to be in responsible charge of that firm's radon mitigation activities.**
- (2) **If the mitigation firm employee is no longer under the responsible charge of the mitigation certified individual, the mitigation firm employee's Department listing becomes invalid.**
- (3) **The mitigation certified individual shall notify the Department within 5 days from when a mitigation firm employee is no longer under the responsible charge of the mitigation certified individual.**
- (4) **The mitigation firm employee shall conduct activities in accordance with the signed mitigation firm employee application.**
- (5) **A mitigation firm may list a maximum of five mitigation firm employees at one time.**
- (6) **Each mitigation firm employee applicant shall submit:**
- (i) **A completed firm employee application as provided by the Department.**
- (ii) **The applicant's current photograph, in a format specified by the Department, to be used on the identification card as required in § 240.142 (relating to testing and mitigation identification cards).**
- (iii) **Proof of passing a Department-approved course on radon mitigation or passing a Department-approved mitigation exam.**

(7) **The mitigation certified individual must receive written approval from the Department before the mitigation firm employee may conduct radon mitigation activities.**

(8) **A mitigation certified individual may not also be a mitigation firm employee.**

(c) *Additional requirements.* If the applicant for mitigation certification is a firm, or an individual performing mitigation and not working for a certified mitigation firm, he shall also have a health and safety program, and a continuing education program, as required in §§ 240.305 and 240.306 (relating to health and safety program; and continuing education program).

### **§ 240.113. Radon mitigation application contents.**

**(a)** An application for radon mitigation certification, by **[both]**an individual or a firm, shall be submitted to the Department in writing on forms provided by the Department and must contain:

(1) Evidence that the applicant has the certification prerequisites contained in § 240.112 (relating to prerequisites for radon mitigation certification). **[including the services offered and experience in each. If the applicant is a firm, the applicant]****The application must [shall also] include the duties assigned to the certified individual in responsible charge of the mitigation activities.**

(2) A nonrefundable fee as set forth in Appendix A (relating to radon certification fee schedule).

(3) The applicant's name, address, **[and]** telephone number **and, if the applicant is an individual, the applicant's date of birth.** It must also indicate if the applicant is an individual, partnership, limited partnership, corporation or other entity. The application must include, when appropriate, the name and address of every officer, general and limited partner, director, principal shareholder, parent corporation and certified person within the applicant's organization.

(4) Compliance information, including descriptions of notices of violation, administrative orders, civil penalty assessments and actions for violations of the act, this chapter or a term or condition of a certification.

(5) **Copies of reporting forms, information distributed to potential clients and recent or proposed advertisements.**

(6) **The applicant's current photograph, in a format specified by the Department, to be used on the identification card as required in § 240.142.**

**[(5)] (7)** Other information the Department may require related to an applicant's qualifications or technical or administrative information related to radon mitigation.

**[(6)] (8)** A verification by **[a responsible official of]** the applicant that the information contained in the application is correct to the best of the **[official's]**

applicant's information and belief. This verification shall be subject to the penalties of 18 Pa. C.S. § 4904.

**(b) Within 10 days of a change to the information submitted in the mitigation certification application, the certified mitigation individual shall submit to the Department a written and signed notification listing each change. The change may not take effect until the Department provides written approval of the change.**

#### **§ 240.114. Application filing deadline.**

A person who anticipates conducting radon mitigation services shall file a complete application for certification a minimum of 30 days prior to the anticipated starting date of mitigation activities. **A mitigation individual renewal application postmarked after the previous mitigation individual certification expiration date will be charged a late application fee as set forth in Appendix A (relating to radon certification fee schedule).**

### **CERTIFICATION FOR RADON LABORATORY**

#### **§ 240.121. Requirements for radon laboratory certification.**

**(a) A person in this Commonwealth or a person analyzing devices placed or retrieved in this Commonwealth may not perform laboratory analysis or represent or advertise that he may perform laboratory analysis of radon testing devices supplied to the public or of samples or devices received from the public or from other certified persons, unless that person has first applied for and obtained radon laboratory analysis certification from the Department[,] or is Department-listed as a firm employee of a certified laboratory firm.**

**(b) For a firm to perform radon laboratory analysis it shall employ one individual certified to perform laboratory analysis, and the firm shall submit an application for certification and receive certification from the Department.**

**(c) Not every individual within the firm is required to be certified to perform laboratory analysis.**

**(d) Prior to performing laboratory analysis, a person shall obtain radon laboratory individual certification or Department-listing as an employee of a laboratory firm.**

#### **§ 240.122. Prerequisites for radon laboratory certification.**

*(a) Individual certification for laboratory analysis.* A person will not be certified to perform radon laboratory analysis unless the person has **[done the following]:**

(1) **Completed [Taken]** a Department-approved course on radon.

(2) Had 1 year professional experience in performing laboratory analysis of radon measurement devices or samples or is certified in Health Physics by the American Board of Health Physics[.] **or equivalent certification or professional work experience, or both, as determined by the Department.**

(3) Received a bachelors degree in the physical sciences or engineering or related fields as approved by the Department, or the education or professional work experience equivalent to a degree, as determined by the Department.

(4) Submitted a complete and accurate application to the Department, including applicable fees.

(b) *Firm certification for laboratory analysis.* If the applicant for radon laboratory certification is a firm, it shall employ [at least] one individual who is certified to perform radon laboratory analysis and who is in responsible charge of the laboratory radon analytical activities. **[If the firm loses its certified individual, the certification automatically lapses and is void until the firm has notified the Department of employment of another certified individual. Within 5 days the firm shall notify the Department in writing when it loses its certified individual.]**

**(1) The firm owner shall notify the Department in writing within 5 days of losing its certified individual. When the firm loses its certified individual, the firm's certification automatically lapses and is void until the Department approves in writing the firm owner's written and signed request for a certified individual to be in responsible charge of that firm's radon laboratory activities.**

**(2) A laboratory certified individual may not also be a laboratory firm employee.**

**(3) If the laboratory firm employee is no longer under the responsible charge of the laboratory certified individual, the firm employee's Department listing becomes invalid.**

**(4) Activities of the laboratory firm employee shall be conducted in accordance with the signed laboratory firm employee application.**

**(5) The laboratory certified individual shall notify the Department with 5 days of when a firm employee is no longer under the responsible charge of the certified laboratory individual.**

**(6) Each laboratory firm employee applicant shall submit a completed and signed laboratory firm employee application as provided by the Department.**

**(7) Each laboratory firm employee shall receive written approval from the Department prior to conducting radon laboratory activities as a laboratory firm employee.**

(c) *Additional requirements.* If the applicant for radon laboratory certification is a firm, or an individual performing laboratory analysis and not working for a certified laboratory, the applicant shall also have a quality assurance program and a continuing education program as required in §§ 240.304—240.307. In addition, the applicant shall

be successfully enrolled in **[the EPA] a Department-approved** radon measurement proficiency program **[or equivalent,]** as required in §§ 240.304—240.307.

### § 240.123. Radon laboratory application contents.

**(a)** An application for radon laboratory certification, **by an individual or a firm,** shall be submitted to the Department in writing on forms provided by the Department and must contain:

(1) Evidence that the applicant has the certification prerequisites contained in § 240.122 (relating to prerequisites for radon laboratory certification). **[, including the services offered and experience in each. If the applicant is a firm, the] The [applicant] application** shall **[also]** include the duties assigned to the certified individual **[.] in responsible charge of the laboratory analysis activities.**

(2) A nonrefundable fee as set forth in Appendix A (relating to radon certification fee schedule).

(3) The applicant's name, address, **[and]** telephone number **and, if the applicant is an individual, the applicant's date of birth.** It must also indicate if the applicant is an individual, partnership, limited partnership, corporation or other entity. The application must include, when appropriate, the name and address of every officer, general and limited partner, director, principal shareholder, parent corporation and certified person within the applicant's organization.

(4) Compliance information, including descriptions of notices of violation, administrative orders, civil penalty assessments and actions for violations of the act, this chapter or a term or condition of a certification.

(5) Other information the Department may require related to an applicant's qualifications or technical or administrative information related to laboratory analysis of radon samples.

(6) A verification by **[a responsible official of]** the applicant that the information contained in the application is correct to the best of the **[official's] applicant's** information and belief. **This verification shall be subject to the penalties of 18 Pa. C.S. § 4904.**

**(b) Within 10 days of a change to the information submitted in the laboratory certification application, the laboratory certified individual shall submit to the Department a written and signed notification listing each change.**

### § 240.124. Application filing deadline.

A person who anticipates performing laboratory analysis of samples to determine radon concentrations shall file a complete application for laboratory analysis certification a minimum of 30 days prior to the anticipated starting date of laboratory analysis. **[and any] A laboratory individual certification** application postmarked after the **previous**



**laboratory individual** certification expiration date will be charged a late application fee as set forth in Appendix A (relating to radon certification fee schedule).

## CERTIFICATION FOR PERSONS CERTIFIED IN ANOTHER STATE

### § 240.131. States with reciprocal agreements with the Commonwealth.

The Department may enter into a reciprocal agreement with another state recognizing each state's radon certification program. The Department will not recognize another state's program unless the program's certification is compatible with the one established under the act and this chapter. The Department will publish a notice in the *Pennsylvania Bulletin* listing the state programs it has recognized.

### § 240.132. Limited radon practice in this Commonwealth.

A person may test, mitigate or perform laboratory analysis without first obtaining certification from the Department if the person does the following:

- (1) **[The person has obtained]** **Obtains** certification to do so from a state with which the Department has entered into a reciprocal agreement.
- (2) **[The person conducts]** **Conducts** that activity in this Commonwealth **[less]** **fewer** than 90 days each calendar year.

### § 240.133. Certification application contents.

**(a)** A person who has a certification from a state with which the Department has entered into a reciprocal agreement, and who intends to conduct the radon-related activity in this Commonwealth for **[at least]** 90 days **or more** a year, shall **first** obtain certification from the Department. The application must be in writing and contain:

- (1) A copy of the **[certificatin]** **certification** from **the** foreign state.
- (2) A nonrefundable fee **[of \$200.] as set forth in Appendix A (relating to radon certification fee schedule).**
- (3) The applicant's name, address, **[and]** telephone number **and, if the applicant is an individual, date of birth.** It must also indicate if the applicant is an individual, partnership, limited partnership, corporation or other entity. The application must include, when appropriate, the name and address of every officer, general and limited partner, director, principal shareholder, parent corporation and certified person within the applicant's organization.
- (4) Compliance information, including descriptions of notices of violation, administrative orders, civil penalty assessments and actions for violations of the act, this chapter or a term or condition of a certification.

(5) Other information the Department may require related to an applicant's qualifications, or technical or administrative information related to radon testing, mitigation of radon contamination or laboratory analysis of radon samples.

(6) A verification by [a responsible official of] the applicant that the information contained in the application is correct to the best of the [official's] applicant's information and belief.

**(b) Within 10 days of a change to the information submitted in the certification application, the certified individual shall submit to the Department a written and signed notification listing each change.**

*(Editor's Note: Sections 240.141-240.143 are new and are printed in regular type to enhance readability.)*

## OTHER CERTIFICATION PROCEDURES

### § 240.141. Withdrawal of applications and certifications.

(a) *Withdrawal of applications.*

(1) An application may be withdrawn before Department approval is granted.

(2) Fees will not be refunded.

(3) After an application for certification is withdrawn, a person who wishes to reapply for certification shall submit a new application along with the appropriate fee set forth in Appendix A (relating to radon certification fee schedule).

(4) The withdrawal is complete when the following conditions have been met:

(i) The request for an application withdrawal has been submitted to the Department in writing and signed by the applicant.

(ii) The Department has confirmed the withdrawal in writing.

(b) *Withdrawal of certifications.*

(1) A certified testing, mitigation or laboratory individual may request that the Department withdraw his individual certification or a firm certification.

(2) The withdrawal is complete when the following conditions have been met:

(i) The request has been submitted in writing and signed by one of the following:

(A) The certified individual for the withdrawal of a certified individual certification.

(B) The firm owner for the withdrawal of a firm certification.

(ii) The Department has approved the withdrawal request in writing.

(c) *Withdrawal of a testing or laboratory individual certification by the Department.*

(1) The Department may withdraw a testing or laboratory individual certification when that individual no longer has Department-listed testing devices.

(2) The Department will confirm the withdrawal in writing.

(d) *Re-instatement of withdrawn certifications.*

(1) The previously certified individual may request to re-instate his testing, mitigation or laboratory individual certification or the firm owner may request to re-instate the testing, mitigation or laboratory firm certification prior to the withdrawn certification's expiration date.

(2) The Department will approve or disapprove this request in writing.

(3) A person who wishes to reapply for certification after the expiration of his previous certification shall submit a new application along with appropriate fees as set forth in Appendix A (relating to radon certification fee schedule).

**§ 240.142. Testing and mitigation identification cards.**

(a) The following persons shall obtain Department identification cards:

- (1) Individuals for testing certification.
- (2) Individuals for mitigation certification.
- (3) Each testing firm employee.
- (4) Each mitigation firm employee.

(b) Each applicant referenced in subsection (a) shall submit the applicant's current photograph, in a format specified by the Department, to the Department with the application.

(c) Each person listed in subsection (a) shall wear prominently the Department-issued identification card while performing radon-related activities and present the Department-issued identification card to a client upon request.

**§ 240.143. Adding or removing devices from certification.**

- (a) To add or remove a device from laboratory or testing certification, the certified individual shall submit a written and signed request to the Department.
- (b) The certified individual who analyzes each continuous monitor and electret reader shall provide in the request the specific serial number and proof of current calibration of each device to be added.
- (c) The certified individual who analyzes each continuous monitor and electret reader shall provide in the request the specific serial number of each device to be removed.
- (d) The device will be considered Department-listed or removed on the effective date stated in the Department's confirmation letter to the certified individual.
- (e) After the effective removal date of the device, the device may no longer be used to conduct radon testing activities or laboratory analysis.
- (f) Written approval to add a specific device must be received from the Department prior to performing radon testing activities or laboratory analysis with the device.

**Subchapter C. CERTIFICATION REVIEW PROCEDURES AND STANDARDS**

Sec.

- 240.201. Criteria for [certification] issuance or denial **of certifications or course provider applications.**
- 240.202. Terms of certification.
- 240.203. Conditions of certification.
- 240.204. Certification renewal.
- 240.205. Certification modification.
- 240.206. Notice of certification.

**§ 240.201. Criteria for [certification] issuance or denial of certifications or course provider applications.**

- (a) A certification **or course provider** application will not be approved unless the applicant affirmatively demonstrates to the Department's satisfaction that the following conditions are met:
  - (1) Neither the applicant nor a person identified in the application **or involved with the course or its development** is in violation of the act or this chapter or has been decertified under § 240.403 (relating to decertification).
  - (2) The application is accurate and complete and the applicant is in compliance with the requirements of the act and this chapter.
  - (3) The applicant has the qualifications required in this chapter and is capable of performing the activities for which he is seeking certification as required by the act and this chapter.

(b) The Department may deny **the certification or course provider application of [to]** a person who has shown a lack of ability or intention to comply with the acts or this chapter, as indicated by past or continuous conduct. A certification lapse under § 240.203(b) (relating to conditions of certification) may be considered evidence of a lack of ability or intention to comply with the acts or this chapter.

#### **§ 240.202. Terms of certification.**

- (a) A certification will be valid for 2 years following issuance.
- (b) Testing, mitigation or **laboratory analysis [other radon-related activity]** may not be conducted after the expiration of the term of certification.

#### **§ 240.203. Conditions of certification.**

(a) Persons certified under this chapter shall, at a minimum, comply with the following conditions:

(1) The certified person shall conduct **[his] all** activities as described in the approved application.

(2) The certified person shall allow the Department, its agents and employees, without advance notice or a search warrant, upon presentation of appropriate credentials, and without delay, to have access to the person's facilities, offices and files for inspection and examination of records. The certified person shall also allow the Department, its agents and employees to accompany him while performing radon-related activities for the purpose of inspection of those activities.

(3) The certified person shall remain in compliance with the acts and this chapter.

(4) For certification of a firm, the certified **[person] individual** shall **[continue to direct] remain in responsible charge of** the radon-related activities. The certified **[person] individual** shall have his duties **and responsibilities** listed in the firm's certification application.

**(5) Certified testing and laboratory individuals shall pass blind studies conducted by the Department. The individual measurement results of the blind study must achieve an individual relative percent error of less than or equal to +/- 25% of the reference value.**

(b) The Department may suspend certification if a condition of certification is violated. The Department will publish notice of the suspension in the *Pennsylvania Bulletin*.

#### **§ 240.204. Certification renewal.**

**(a)** An application for certification renewal shall contain the contents required in an initial certification application, except that the Department may permit an applicant to rely on information previously submitted if the information remains the same. A certification renewal application shall be issued or denied according to the criteria in § 240.201 (relating to criteria for certification issuance or denial).

**(b) Prior to the expiration of radon certification, a person who intends to continue to provide radon-related services in the Commonwealth shall submit an application for certification renewal. To avoid a lapse in certification, an applicant for certification renewal shall file an application at least 30 days prior to the expiration of the current certification. Submitting a renewal application does not extend the previous certification period. The certified person is responsible to make a timely application for certification renewal.**

**(c) For an application from a radon service provider postmarked after the expiration of the certification, the following criteria will determine application requirements:**

**(1) An individual certification application postmarked prior to 1 year after the expiration of the certification is a renewal application subject to the late application fee set forth in Appendix A (relating to radon certification fee schedule).**

**(2) An individual certification application received 1 year or more after expiration of certification is an initial application subject to the initial application fee set forth in Appendix A (relating to radon certification fee schedule). This application is not subject to the late application fee set forth in Appendix A (relating to radon certification fee schedule).**

#### **§ 240.205. Certification modification.**

The terms and conditions of a certification are subject to amendment, revision or modification **by the Department** for a violation of the acts, this chapter or a term or condition of the certification, or for a false statement made to the Department by the certified party, or for a change of condition which would warrant the issuance or denial of a certification on the basis of an original application.

#### **§ 240.206. Notice of certification.**

The Department will publish as a notice in the *Pennsylvania Bulletin* the name and address of each person certified under this chapter.

### **Subchapter D. OPERATION REQUIREMENTS**

Sec.

- 240.301. Advertising.
- 240.302. Notice to clients.
- 240.303. Reporting of information.
- 240.304. [Quality assurance program.] **[Reserved.]**
- 240.305. Health and safety program.
- 240.306. Continuing education program.

240.307. [EPA Radon Measurement Proficiency Program.] Radon measurement proficiency program.

240.308. [Testing and] Radon mitigation [protocols] standards.

240.309. Testing protocols.

**§ 240.301. Advertising.**

A person may not advertise a radon-related service or product with false or misleading statements regarding the [offered service or product] services or products offered, health effects, [or the risks to health,] or property value. A person required to obtain certification may not advertise a service or product, unless the person [has previously obtained] currently holds a valid certification from the Department to perform that service or provide that product. Advertising for a radon-related service or product must include the valid Department certification number of the certified individual providing that service.

**§ 240.302. [Notice to clients] Required client information.**

(a) A person may not test, mitigate against radon or provide a radon-related service or product without first offering the potential client a price list of services offered, and providing evidence of certification and a notice that only persons certified under the act and this chapter may provide the services or products. For [a person who mitigates against radon] mitigators, a written estimate for services shall constitute a price list. The notice shall read substantially as follows:

**NOTICE TO CLIENTS:**

**[The Radon Certification Act requires that anyone who provides any radon-related service or product to the general public must be certified by the Pennsylvania Department of Environmental Protection. You are entitled to evidence of certification from any person who provides such services or products. You are also entitled to a price list for services or products offered. All radon measurement data will be sent to the Department as required in the Act and will be kept confidential. If you have any questions, comments or complaints concerning persons who provide radon-related services, please contact the Department at the Bureau of Radiation Protection Department of Environmental Protection, P. O. Box 8469, Harrisburg, PA 17105-8469, (717) 783-3594.]**

**Pennsylvania law requires that anyone who performs radon testing, mitigation or laboratory analysis activities for the general public must be currently certified by the Pennsylvania Department of Environmental Protection (DEP). Any person providing these radon services shall present to the client a current Department-issued photo identification card upon request. If you have questions, you may contact DEP at the Bureau of Radiation Protection, Department of Environmental Protection, P.O. Box 8469, Harrisburg, Pa. 17105-8469, (717) 783-3594.**

(b) For a person performing mitigation, warranty information, **if offered**, and information on the proper method of checking and servicing of mitigation equipment to maintain its function shall be provided in writing to the client.

### **§ 240.303. Reporting of information.**

**[(a) Within 45 days after testing, mitigation or other radon-related service is provided, the person providing the service shall submit to the Department in a format approved by the Department the results of testing, including screening measurements, follow-up measurements, premitigation measurements, postmitigation measurements and the method used to mitigate against radon contamination. If no testing, mitigation or radon-related service has been provided during this 45-day period, that person shall inform the Department of same in writing. Anyone required to provide this 45-day reporting who does not report within 90 days of the completion of the activity will be subject to the Late 45-Day Reporting Fee as set forth in Appendix A (relating to radon certification fee schedule).]**

**This section specifies reporting requirements for testing, mitigation and other radon-related services.**

#### **(1) Laboratory or primary tester reporting.**

**(i) A primary testing or laboratory certified individual performing analyses shall report test results to the Department within 45 days of the analysis date. If no radon-related analysis is provided during a 45-day period, the certified individual shall inform the Department by the end of that 45-day period in a format approved by the Department. Radon tests used for diagnostic purposes shall be identified as “diagnostic” when submitted to the laboratory. [At a minimum, these results will be retained for 2 years.]** The information must include:

**[(1)] (A)** The name **and certification number** of the person **certified to provide** [providing] the **testing or laboratory analysis** service.

**[(2)]** [The name and address of the owner or occupant of the building involved.]

**[(3)] (B)** The address [**and location**] of the building [**involved**] **tested**, including street and number, post office, full zip code and county.

**[(4)] (C)** The **begin and end** date **of** each measurement [**was taken, or the mitigation performed**], **measurement method, and location in the building.**

**[(5)] (D)** The type of house or building, the types of [measurements] **measurement devices used, the** location within the building of specific measurements, and the results in picocuries per liter [**or in working levels**].

**[(6)]** The type and price of mitigation system installed.]

**(E) The operational status of the mitigation system at the test site.**



- (F) The date the analysis was performed.**
- (G) The serial number of the CM or electret reader.**
- (H) Other test or lab information as determined by the Department.**

**(ii) The primary testing or laboratory certified individual shall retain for 5 years the test result documentation identified in subparagraph (i).**

**(iii) The following test results should not be reported to the Department:**

- (A) An invalid test.**
- (B) A diagnostic test.**
- (C) A measurement performed only for quality assurance.**

**(2) Mitigation reporting.**

**(i) A mitigation certified individual shall report the mitigation activity results to the Department within 45 days of the mitigation system initial fan activation or the alteration to an existing mitigation system. If no mitigation activity is performed during a 45-day period, the certified individual shall inform the Department by the end of that 45-day period in a format approved by the Department. The reported information must include:**

- (A) The name and certification number of the person providing the service.**
- (B) The address of the building involved, including street and number, post office, full zip code and county.**
- (C) The date of the initial fan activation or the alteration to an existing mitigation system.**
- (D) The type of house or building.**
- (E) The type of mitigation installation or alteration.**
- (F) The cost to the client.**
- (G) The postmitigation result.**
- (H) Other mitigation information as determined by the Department.**

**(ii) The mitigation certified individual shall retain for 5 years the mitigation activity result documentation identified in subparagraph (i).**

**[(b)] (3) Reporting to client.** Within 45 days after testing, mitigation or other radon-related service is provided, the person providing radon-related services shall report in writing to the **[owner or occupier of the building] client** the results in picocuries per liter and when appropriate in working levels of radon measurements taken in the building. If a **[person] secondary tester** provides the service through a certified

**[intermediary] laboratory**, it is the responsibility of the **[intermediary] testing certified individual** to report the results **to the client**.

**[(c)] (4) Postmitigation testing and reporting.** For a person performing mitigation, each building shall be tested for radon levels before and after the mitigation is performed. Each test must be at least 48 hours in duration and follow **[EPA- or] Department-approved protocols, § 240.308(e) (relating to confirmatory testing) after system installation, and § 240.309 (relating to testing protocols)**. The postmitigation test shall be conducted no sooner than 24 hours after completion of the mitigation. The results of **[radon testing] the postmitigation test** shall be reported in accordance with this section.

**§ 240.304. [Quality assurance program.] [Reserved.]**

**[A person conducting radon testing or radon laboratory analysis activities shall have a quality assurance program to assure that measurements are accurate and errors are controlled. The program shall insure that testing devices are routinely and properly calibrated. The program shall provide the information related to the following activities:**

- (1) Organization and responsibilities.**
- (2) Sampling procedures.**
- (3) Detector custody.**
- (4) Analytical procedures.**
- (5) Data reduction, validation and reporting.**
- (6) Corrective action.**
- (7) Quality assurance reports to management. ]**

**§ 240.305. Health and safety program.**

**[A person conducting radon-related activities] A mitigation certified individual** shall have a radon health and safety program to protect himself and **Department-listed firm employees [employes]** from exposure to radon **[during the course of their employment]**. The program shall include records of each **[individual's] mitigator's** exposure to radon **during the course of his employment. The mitigation certified individual shall record the items on the form in Appendix I and shall retain the records for a period of 5 years. [Persons conducting radon-related activities] Testers and mitigators** shall maintain exposure to radon as low as reasonably achievable **(ALARA)**. **A tester or mitigator may not exceed 4 WLM/yr in radon exposure.**

**§ 240.306. Continuing education program.**

[A person conducting radon-related activities shall have a radon education program to assure that the applicant and all employees have a minimum of 4 hours initial training, and] Upon certification renewal, the certified [person] individual shall [participate in a continuing education program consisting of a minimum of 8 hours of Department-approved courses or seminars on radon testing or mitigation each year] submit to the Department proof of having satisfactorily completed 16 credit hours of Department-approved continuing education courses or Department-approved equivalent. Continuing education credit hours may only be used for one certification period for each certification activity.

§ 240.307. [EPA Radon Measurement Proficiency Program] Radon measurement proficiency program.

[A person conducting radon testing or radon laboratory activities]An initial laboratory individual applicant, initial primary testing individual applicant, and an applicant applying to add a new primary testing or laboratory device shall provide written evidence of successful participation [in the most recent EPA Radon/Radon progeny Measurement Proficiency Program or an alternative program approved by the Department for each radon measurement utilized] in a Department-approved radon measurement proficiency program for each model type.

§ 240.308. Radon [Testing and] mitigation [protocols] standards.

(a) Terminal discharge. To prevent reentrainment of radon, fan discharges of depressurization systems, whether fan-powered or passive, must meet the following requirements:

(1) The termination point must be vertical, upward, outside the structure, and discharging to the atmosphere. Rain caps or terminal bends may not be used.

(2) For vent pipes attached to the side of a building, the termination point must be above the immediate edge of the roof.

(3) For vent pipes that penetrate the roof, the termination point must be at least 12 inches above the surface of the roof.

(4) The termination point must be 10 feet or more above the ground level nearest to the point of discharge.

(5) The termination point must be 10 feet or more from an operable window unit, door, or other opening into conditioned spaces unless it is 2 feet above the top of such openings. The 10-foot distance may be measured directly between the opening and the exhaust point or with a flexible tape following the shortest path possible around intervening solid objects. A chimney is not considered an opening into conditioned spaces.

(6) The termination point must be 10 feet or more horizontally from a vertical wall that extends above the roof.

**(7) The termination point must be 10 feet or more from an opening into an adjacent structure.**

**(b) *Fan Location.* A radon fan used in active soil depressurization or a block wall depressurization systems shall not be installed:**

**(1) Below grade or in the heated or cooled space of a building.**

**(2) In basement, crawl space, or other interior location directly beneath the heated or cooled spaces of a building.**

**(c) *Sealing.***

**(1) When accessible, the following are required to be adequately sealed with urethane caulk or equivalent material using methods and materials that are permanent and durable when installing a mitigation system:**

**(i) Perimeter channel drains.**

**(ii) Cracks that exist where the slab meets the foundation wall (floor wall joint).**

**(iii) Openings or cracks in the foundation or at expansion or control joint.**

**(2) When the opening or channel is greater than 1/2 inch in width, a foam backer rod or other equivalent filler material shall be inserted into the channel before application of the sealant. Materials inserted into the channel must leave adequate space below the filler material to allow sub-surface drainage from the channel into the subslab material.**

**(3) If the mitigator and homeowner determine that the perimeter channel drain cannot be sealed for water control reasons, or that openings or cracks are inaccessible, then the mitigator may leave those areas unsealed and shall provide the following written statements to the homeowner:**

**(i) This technique may contribute to an increased heating and cooling penalty.**

**(ii) This technique may decrease the efficiency of the radon mitigation system.**

**(iii) This technique may increase the potential for backdrafting natural draft combustion appliances.**

**(d) *Labeling.***

**(1) If the mitigation system is accessible and visible, then a system description label shall be prominently and permanently affixed to the mitigation system piping. If the mitigation system is concealed or not accessible, then the label shall be placed in another prominent location. The label shall be legible from a distance of at least three feet and include the following information:**

**(i) “Radon Reduction System.”**

**(ii) The name and certification number of the mitigation certified individual.**

- (iii) The contact telephone number of the mitigator.
  - (iv) The date of installation.
  - (v) “Building should be tested for radon at least every two years.”
- (2) Each exposed and visible interior radon mitigation system vent pipe section shall be identified with at least one label on each floor level. The label shall read “Radon Reduction System.”
- (e) Confirmatory testing after system installation. A certified mitigation individual shall ensure that a short-term postmitigation test is conducted by an independent third-party, Department-certified tester. The independent third-party, Department-certified tester must have no financial, official, or other connection to the certified mitigation individual that may create a potential conflict of interest.
- (f) Required client information. Upon completion of the mitigation project, the mitigator shall provide an information package. This information package must be attached to the mitigation system in a secure and permanent manner, visible location, and labeled "Radon Mitigation Information." The information package must include the following:
- (1) A completed copy of the Radon Mitigation Project Record from “Pennsylvania Radon Mitigation Standards,” 294-2309-002, October 1, 1997, Appendix A.
  - (2) A final mitigation system layout with the system’s components labeled on a floor plan.
  - (3) A copy of contracts and warranties for the mitigation system.
  - (4) A description of the installed mitigation system and its basic operating principles.
  - (5) A description of the proper operating procedures of installed mechanical or electrical systems, including the manufacturer's operation and maintenance instructions, drain-filling instructions, and warning device interpretations.
  - (6) A list of appropriate actions for the client to take if the system failure warning device indicates system degradation or failure.
  - (7) A recommendation to retest at least every two years.
  - (8) A recommendation to have an electrical inspection performed on the applicable components of the installed system.
- (g) Compliance. A person conducting radon [testing or] mitigation [for radon contamination] activities shall conduct the [testing and] mitigation in accordance with [EPA- or DEP-approved protocols] Department-approved mitigation standards and shall comply with applicable statutes, regulations, ordinances and building codes. The [following protocols, “Protocols for Radon and radon Decay Product Measurements in Homes,” “Indoor Radon and Radon Decay Product Measurement Device Protocols” and “Pennsylvania Radon Mitigation Standards”] “Pennsylvania Radon Mitigation Standards” are available upon request from the following source:

[Environmental Protection Agency

**Office of Radiation Programs  
Washington, D.C. 20460]**

Department of Environmental Protection  
Bureau of Radiation Protection  
Rachel Carson State Office Building, 13th Floor  
400 Market Street  
Post Office Box 8469  
Harrisburg, Pennsylvania 17105-8469

**(Editor's Note: The following section is new and is printed in regular type to enhance readability.)**

**§ 240.309. Testing protocols.**

(a) *Radon testing protocols.* The testing certified individual shall ensure that the requirements in this section are completed. For testing that is required to be reported to the Department under § 240.303(a) (relating to reporting of information), radon testing shall be performed in accordance with the following testing protocols:

(1) *Placement of testing devices.* Testing devices shall be placed as follows:

- (i) At least 3 feet from exterior doors, windows or ventilation ducts.
- (ii) Out of the direct flow of air.
- (iii) At least 1 foot from ceilings and exterior walls.
- (iv) At least 20 inches but not more than 6 feet from the floor.
- (v) At least 4 inches from other objects horizontally or vertically above the detector.
- (vi) At least 4 feet from heat sources including fireplaces, furnaces and direct sunlight.
- (vii) At least 7 feet from sump pits.
- (viii) Where the device will remain undisturbed during the test period.

(2) *Improper placement of testing devices.* Testing devices may not be placed in the following locations:

- (i) Bathrooms.

- (ii) Kitchens.
- (iii) Within 10 feet of washer/dryer unit.
- (iv) Spa rooms or other areas of high humidity.
- (v) Closets.
- (vi) Cupboards.
- (vii) Sump pits.
- (viii) Crawlspace or nooks within the foundation.

(3) *Short-term tests.* Short-term tests shall be taken in the lowest livable level of each structural zone that contacts the soil.

(4) *Conditions of testing.* Testing shall be conducted under the following conditions:

- (i) Testing devices must remain undisturbed during the testing period.
- (ii) A short-term test must range in duration from 48 hours to 90 days.
- (iii) Short-term tests must be conducted under closed-building conditions.
- (iv) Closed-building conditions must begin at least 12 hours prior to the beginning of the test period for tests lasting less than 96 hours.
- (v) Closed-building conditions consist of the following criteria:
  - (A) All windows must be closed.
  - (B) All external doors must be closed except for normal entry and exit. Structural openings due to disrepair or structural defects shall be repaired to correct their condition prior to initiation of testing.
  - (C) Normal operation of permanently installed HVAC systems must continue during closed-building conditions.
  - (D) Fireplaces, wood stoves and coal stoves may not be operated unless they are normal sources of heat for the building.

(E) Air-conditioning systems that recycle interior air may be operated during closed-building conditions.

(F) Whole-house fans may not be operated during the test period. Portable window fans shall be removed from windows or sealed in place. Window air conditioning units may only be operated in a recirculation mode. If the building contains an air handling system, the air handling system may not be set for continuous operation unless the air handling equipment is specifically used for radon control and is labeled accordingly.

(G) In buildings with permanently installed radon mitigation systems, the mitigation system must be functioning during the test period.

(H) Operation of fans, portable dehumidifiers, portable humidifiers, portable air filters and window air conditioners may not create a direct flow of air on the radon testing device.

- (vi) All closed-building conditions shall be inspected and documented at the time of placement and retrieval of the detectors.
  - (vii) Short-term tests of fewer than 96 hours may not be conducted during severe storms or periods of sustained high winds of 30 miles per hour or greater. Local weather forecasts shall be checked and documented prior to placing short-term test devices when the test period is less than 96 hours.
  - (viii) Instructions describing closed-building conditions required in this section shall be provided to the persons who control the building and shall be documented.
  - (ix) Only co-located duplicate tests may be averaged.
- (5) *Minimum requirements for short-term testing.*
- (i) *Simultaneous testing using short-term passive devices.*

(A) Simultaneous testing must comprise of at least 2 short-term indoor radon tests conducted simultaneously with identical test devices.

(B) Simultaneous testing devices shall be:

(I) Co-located and the near edges spaced 4 to 5 inches apart.



(II) Exposed for the same test period.

(C) The results of both tests and the average of the simultaneous tests shall be reported to the client, except as indicated in subclause (II):

(I) If the RPD is greater than 67% for simultaneous test results that are both between 2.0 and 3.9 pCi/L, the test result shall be reported to the client and the cause investigated, documented and corrected.

(II) If the RPD is greater than 36% for simultaneous test results that are both equal to or greater than 4.0 pCi/L, the test result may not be reported to the client, and the cause must be investigated, documented and corrected.

(D) If one test is equal to or greater than 4.0 pCi/L and one test is less than 4.0 pCi/L, and the higher test is more than twice the amount of the lower test, the results are invalid.

(ii) *Continuous radon monitor (CRM) testing.*

(A) A CRM must have the capability to integrate and record a new result at least hourly.

(B) The minimum test period is 48 hours, with 44 contiguous hours of usable data to produce a valid average. The first 4 hours of data from a CRM may be discarded.

(C) The contiguous results shall be averaged to produce a result that is reported to the client.

(D) A copy of the hourly printout shall be provided to the client as part of the test results.

(6) *Real estate testing.* Real estate testing shall be conducted using the following anti-tampering procedures:

(i) Testing devices shall be secured against movement by employing anti-tampering methods.

(ii) The buyer, seller, occupant, real estate professional or other individual in control of the property shall sign Conditions for Short-Term Radon Testing Agreement, which must contain the information in Appendix B (relating to non-interference agreement for real estate radon testing).

- (iii) If the Conditions for Short-Term Radon Testing Agreement cannot be signed by the buyer, seller, occupant, real estate professional or other individual in control of the property, the reason shall be documented on the completed agreement.
- (iv) A Radon Testing in Progress Notice shall be posted at every building entry and in a conspicuous indoor location. The notice shall be posted upon initiation of a radon test and include the following statements:
  - (A) “Radon Testing in Progress.”
  - (B) “Keep all windows closed.”
  - (C) “Keep all exterior doors closed, except for normal entry and exit.”
  - (D) “Do not move or touch the radon testing device.”

(7) *Multifamily building tests.* Multifamily building tests shall be performed in accordance with ANSI/AARST MSMF-2010 *Protocol for Conducting Radon and Radon Decay Product Measurements in Multifamily Buildings* or its equivalent as determined by the Department.

(8) *School and commercial building tests.* School and commercial building tests shall be performed in accordance with *Radon Measurement in Schools* (EPA 402-R-92-014) or its equivalent as determined by the Department.

(9) *New construction and buildings under renovation.* This paragraph provides the testing requirements for new construction and buildings under renovation. A newly constructed building or existing building under renovation may not be tested for radon or radon progeny unless the following items have been installed:

- (i) Insulation.
- (ii) Exterior doors with associated hardware.
- (iii) Windows.
- (iv) Fireplaces and fireplace dampers, if they are or will be installed.
- (v) Heating, air conditioning and plumbing appliances.
- (vi) Ceilings.

- (vii) Interior trim and coverings for the exterior walls.
  - (viii) Exterior siding, weatherproofing and caulking.
  - (ix) Interior and exterior structural components.
  - (x) Interior or exterior work that may adversely affect the test validity.
- (10) *Postmitigation testing.*
- (i) Testing conducted while temporary radon reduction tests are in use may not be used as the postmitigation test.
  - (ii) The mitigation system must be operated continuously during the entire test period.
  - (iii) The postmitigation test may not be performed sooner than 24 hours or later than 30 days following the completion and activation of the mitigation system or an alteration to an existing system.
  - (iv) Postmitigation testing shall be conducted in accordance with this subsection.
  - (v) The postmitigation test may not be performed by the mitigator who installed the mitigation system or the installing mitigator's employee or coworker, as described in § 240.308(e) (relating to confirmatory testing after system installation).

(b) *Result Report Form.*

- (1) A tester shall have a Department-approved Result Report Form. Testers shall provide the client with a completed Result Report Form within 10 working days from the completion of the test or the receipt of the test results from the laboratory. The Result Report Form must contain:
- (i) Each test result in pCi/L and rounded to one decimal place. Standard mathematical rules for rounding shall be followed.
  - (ii) Notification of an invalid radon test with an explanation and without a test result given.
  - (iii) The average of co-located test device results as well as the individual results.
  - (iv) The exact start and stop dates and times of the test period.

- (v) The complete street address of the test location including, when applicable, the apartment, suite or building number.
- (vi) The test device used and its manufacturer, model and serial number.
- (vii) The complete name, street address and telephone number of the tester.
- (viii) The name and Department certification number of each tester placing and retrieving each testing device.
- (ix) The name and certification number of the laboratory analyzing the testing device, if applicable.
- (x) A statement whether a mitigation system was observed in the building during placement or retrieval of the testing device, including whether the mitigation system was operating.
- (xi) A statement describing if tampering, interference or deviations from the required test conditions was observed.
- (xii) A description of the condition (open, closed or N/A) of permanent vents that allow outdoor air into the building, such as crawlspace vents or combustion air supply to combustive appliances.
- (xiii) A description of severe weather conditions during the test period.
- (xiv) The location within the building of each testing device.
- (xv) The Pennsylvania “Notice to Clients” statement as indicated in § 240.302 (relating to notice to clients).
- (xvi) If using a continuous radon monitor, a copy of the device printout.
- (xvii) If using a continuous radon monitor or electret reader, the calibration expiration date.
- (xviii) If using a continuous radon monitor or electret reader, the device serial number.
- (xix) The following radon health risk information:

“Radon is the second leading cause of lung cancer, after smoking. The U.S. Environmental Protection Agency (EPA) and the Surgeon General strongly recommend taking further action when the home’s radon test results are 4.0 pCi/L or greater. The national average indoor radon level is about 1.3 pCi/L. The higher the home’s radon level the

greater the health risk to you and your family. Reducing your radon levels can be done easily, effectively and fairly inexpensively. Even homes with very high radon levels can be reduced below 4.0 pCi/L. For further information about reducing elevated radon levels please refer to the ‘Pennsylvania Citizen’s Guide to Radon.’”

(2) A laboratory shall use a Department-approved Result Report Form. Laboratories shall provide a completed Result Report Form within 10 working days after completion of test analysis. The Result Report Form must contain:

- (i) Each test result in pCi/L and rounded to one decimal place. Standard mathematical rules for rounding shall be followed.
- (ii) Notification of invalid radon tests with an explanation and without a test result given.
- (iii) The average of co-located testing devices as well as the individual results.
- (iv) The exact start and stop dates and times of the test period.
- (v) The complete street address of the test location including, when applicable, the apartment, suite or building number.
- (vi) The test device used and its manufacturer, model and serial numbers.
- (vii) The name and certification number of the laboratory analyzing the testing device.
- (viii) The location within the building of each test device.
- (ix) The Pennsylvania “Notice to Clients” statement as indicated in § 240.302.
- (x) If using a continuous radon monitor, a copy of the device printout.
- (xi) The calibration expiration date of the electret reader or continuous monitor.
- (xii) The following radon health risk information:

Radon is the second leading cause of lung cancer, after smoking. The U.S. Environmental Protection Agency (EPA) and the Surgeon General strongly recommend taking further action when the home’s radon test results are 4.0 pCi/L or greater. The national average indoor radon level is about 1.3 pCi/L. The higher the home’s radon level the greater the health risk to you and your

family. Reducing your radon levels can be done easily, effectively and fairly inexpensively. Even homes with very high radon levels can be reduced below 4.0 pCi/L. For further information about reducing elevated radon levels please refer to the “Pennsylvania Citizen’s Guide to Radon.”

## **Subchapter E. ENFORCEMENT AND DECERTIFICATION**

Sec.

- 240.401. Inspection.
- 240.402. Civil penalties.
- 240.403. Decertification.

### **§ 240.401. Inspection.**

- (a) The Department and its agents and **[employes] employees** will:
  - (1) At all reasonable times, have access to, and require the production of, books and papers, documents and physical evidence pertinent to a matter under investigation related to radon testing, mitigation of radon contamination or radon laboratory analysis.
  - (2) At all reasonable times, enter a building, property, premises or place of a person who conducts radon-related activities for the purpose of making an investigation or inspection necessary to ascertain the compliance or noncompliance with the act and this chapter.
- (b) The Department, its agents and **[employes] employees** may conduct inspections of a building, property, premises or place of business of a person who conducts radon-related activities if a person presents information to the Department or the Department has access to information which gives it reason to believe that one of the following exists:
  - (1) A person may have violated the act or this chapter.
  - (2) A person is not in compliance with the terms or conditions of the person’s certification.
  - (3) A condition or practice exists which may pose a threat to public health, safety, welfare or the environment.
- (c) An agent or **[employe] employee** of the Department may not enter a private residence for the purpose of conducting an inspection under this section without a search warrant or without the consent of the occupant.
- (d) Inspections made under this section are subject to Chapter 220 (relating to notices, instructions and reports to workers; inspections and investigations).

### **§ 240.402. Civil penalties.**

- (a) The Department may assess a civil penalty for a violation of the acts or this chapter.
- (b) A civil penalty may be assessed or increased, based upon:
  - (1) The seriousness of the violation.
  - (2) The monetary loss of an owner or occupier, including the cost to the owner or occupier to remedy the violation.
  - (3) The risks to health and safety.
  - (4) The cost to the Commonwealth in administration, inspection and enforcement, to remedy the violation.
  - (5) The costs avoided by the violator by the violation.
  - (6) The culpability of the violator.
  - (7) The frequency of the violation.
- (c) Each day of a continuing violation is considered a separate violation for purposes of this chapter.

**§ 240.403. Decertification.**

- (a) The Department may decertify a person who has violated the acts, this chapter or a term or condition of certification.
- (b) The Department may hold a public hearing or informal conference prior to decertifying a person.
- (c) The Department will publish in the Pennsylvania Bulletin a notice of decertification.

**[Subchapter F. INTERIM CERTIFICATION]**

[Sec.]

[240.501. Scope. ]

[240.502. Reapplication when this chapter is adopted as final.]

[§ 240.501. Scope.] Reserved

**[This subchapter applies to persons certified in accordance with the Department’s interim certification program as required under section 11 of the act (63 P. S. § 2011).]**

[§ 240.502. Reapplication when this chapter is adopted as final.] Reserved

**[A person granted interim certification by the Department shall reapply for certification under this chapter. If a person fails to apply for certification within 60**

days of Departmental notification, the interim certification automatically lapses and is void. ]

*(Editor's Note: The following subchapter is new and is printed in regular type to enhance readability.)*

## **Subchapter G. QUALITY ASSURANCE REQUIREMENTS**

Sec.

240.601.	Scope
240.602.	General requirements
240.603.	Quality assurance program
240.604.	Quality assurance requirements for testing using primary devices
240.605.	QA requirements for testing using secondary devices
240.606.	QA requirements for laboratories

### **§ 240.601. Scope.**

- (a) This subchapter applies to quality assurance requirements for:
- (1) Persons conducting radon testing and radon laboratory analysis activities.
  - (2) Testing devices listed with the Department certification.
- (b) The subchapter does not apply to tests performed for the sole purpose of diagnostic testing.

### **§ 240.602. General requirements.**

- (a) The certified individual is responsible for all requirements in this subchapter, including when quality assurance (QA) activity is performed by others.
- (b) QA requirements and corrective actions in this section shall be documented and the records retained for a minimum of 5 years.

### **§ 240.603. Quality assurance program.**

A person conducting radon testing or radon laboratory analysis activities shall have a quality assurance (QA) program to ensure the measurements are accurate and errors are



controlled. The program shall ensure that testing devices are routinely and properly calibrated. The program shall provide the information related to the following activities:

- (1) Organization and responsibilities.
- (2) Sampling procedures.
- (3) Detector custody.
- (4) Analytical procedures.
- (5) Data reduction, validation and reporting.
- (6) Corrective action.
- (7) QA reports to management.

**§ 240.604. Quality assurance requirements for testing using primary devices.**

(a) *Continuous radon monitors (CRMs) for primary testers.*

(1) *Calibration.* Each Department-listed CRM must have a current calibration. To have a current calibration, the CRM shall be calibrated in a Department-approved calibration facility within 1 year from the date of the previous calibration and when alterations or repairs are made to the CRM.

(2) *Background measurements.* Background measurements shall be performed and documented after every 1,000 hours of operation of scintillation cell-type CRM. These background measurements shall be checked by purging unit with clean, aged air or nitrogen in accordance with the manufacturer's instructions. For all CRMs, the background shall be monitored in accordance with the manufacturer's instructions.

(3) *Check source counting.* For a CRM with a check source, check source counting shall be documented and completed with that check source prior to each test.

(4) *Routine instrument checks.* Before and after each measurement, the CRM shall be checked according to the manufacturer's instructions. For each check, the following shall be verified:

- (i) The correct input parameters and the unit's clock or timer are set properly.
  - (ii) The pump's flow rates are within the range of the manufacturer's specifications.
- (5) *Data collection log.*
- (i) CRM data shall be tracked on a form that contains the following:
    - (A) The CRM serial number.
    - (B) The exposure dates, times and temperatures.
    - (C) The test result.
    - (D) The address of the building tested.
    - (E) The test location in the building.
    - (F) The name of the tester who placed the CRM.
    - (G) The name of the tester who retrieved the CRM.
    - (H) The calibration, repair and Department listing dates.
  - (ii) For a CRM without a radioactive check source, the data collection log shall also contain the following intercomparison measurement information:
    - (A) The intercomparison devices serial numbers.
    - (B) The RPD value.
    - (C) The intercomparison measurements results.
- (6) *Intercomparison measurements.* An intercomparison measurement shall be performed for each CRM without a radioactive check source.
- (i) Intercomparison measurements shall be made at least every 10<sup>th</sup> test with another Department-listed passive device that is analyzed by a Department-certified laboratory or with another CRM with a hard copy printout. The intercomparison measurements shall be distributed systematically throughout the entire population of test locations. Original printouts or Department-certified laboratory results, or both, shall be kept for each intercomparison. Each intercomparison measurement must be performed with the devices side by side for the measurement for at least 48 hours.
  - (ii) For intercomparison measurements, the RPD shall be used to track performance. The RPD value shall be tracked using control charts from "Protocols for Radon and Radon Decay Product Measurements in Homes," EPA 402-R-92-003, May 1993, Appendix B, Exhibit B-2 and Exhibit B-3.

- (iii) If the RPD value exceeds the control limit, the CRM may not be used for radon measurements until the problem is identified and corrected. If the RPD value exceeds the warning level, the criteria in “Protocols for Radon and Radon Decay Product Measurements in Homes,” EPA 402-R-92-003, May 1993, Appendix B, Exhibit B-5, shall be followed.
  - (iv) In addition to the control charts, all intercomparison measurements shall be documented on the CRM data collection log.
- (b) *Continuous working level monitors (CWLMs) for primary testers.*
- (1) *Calibration.* Each Department-listed CWLM must have a current calibration. To have a current calibration, the CWLM shall be calibrated in a Department- approved calibration facility within 1 year from the date of the previous calibration and when alterations or repairs are made to the CWLM.
  - (2) *Background measurements.* CWLM background measurements shall be performed and documented at least every 168 hours of operation and when the unit is calibrated.
  - (3) *Routine instrument checks.* Routine instrument checks for each CWLM shall be documented and performed before and after each test by using an Am-241 or similar energy check source. Pumps and flow meters shall be checked in accordance with the manufacturer's instructions and documented. The pump and flow meter check shall be performed with a dry-gas meter or other flow measurement device of traceable accuracy.
  - (4) *Data collection log.*
    - (i) CWLM data shall be tracked on a form that contains the following:
      - (A) The CWLM serial number.
      - (B) The exposure dates, times and temperatures.
      - (C) The test result.
      - (D) The address of the building tested.
      - (E) The test location in the building.
      - (F) The name of the tester who placed the CWLM.
      - (G) The name of the tester who retrieved the CWLM.
      - (H) The calibration, repair and Department listing dates.
    - (ii) For CWLMs without a radioactive check source, the data collection log shall also contain the following intercomparison measurement information:
      - (A) The intercomparison devices serial numbers.
      - (B) The RPE value or RPD value.

- (C) The intercomparison measurement results.
- (5) *Intercomparison measurements.* An intercomparison measurement shall be performed for each CWLM monitor without a radioactive check source.
- (i) A CWLM without radioactive check source capability must have an informal intercomparison measurement made with another CWLM with a hard copy printout at least every 10<sup>th</sup> test. This printout shall be retained for each intercomparison. The intercomparison measurements shall be distributed systematically throughout the entire population of test locations. Each intercomparison measurement must be performed with the devices side by side for the measurement for at least 48 hours.
  - (ii) Each intercomparison shall be documented on the data collection log.
  - (iii) For intercomparison measurements the RPD shall be used to track performance. The RPD value shall be tracked using control charts from “Protocols for Radon and Radon Decay Product Measurements in Homes,” EPA 402-R-92-003, May 1993, Appendix B, Exhibit B-2 and Exhibit B-3.
  - (iv) If the RPD value exceeds the control limit, the CRM may not be used for radon measurements until the problem is identified and corrected. If the RPD value exceeds the warning level, the criteria in “Protocols for Radon and Radon Decay Product Measurements in Homes,” EPA 402-R-92-003, May 1993, Appendix B, Exhibit B-5, shall be followed.
- (c) *Electret ion chambers for primary testers.*
- (1) *Calibration.* Each Department-listed electret reader must have a current calibration. To have a current calibration, the electret reader shall be calibrated in a Department-approved calibration facility within 1 year from the date of the previous calibration and when alterations or repairs are made to the electret reader. Each electret reader shall be calibrated simultaneously with its corresponding reference electret’s recertification.
  - (2) *Data collection log.* Electret custody shall be tracked on a form that contains the following:
    - (i) The electret serial number.
    - (ii) The electret chamber serial number.
    - (iii) The initial voltage reading.
    - (iv) The final voltage reading.
    - (v) The exposure dates, times and temperatures.
    - (vi) The test result.

- (vii) The serial number of duplicate electret.
  - (viii) The RPD value.
  - (ix) The address of the building tested.
  - (x) The test location in the building.
  - (xi) The name of the tester who placed the electret.
  - (xii) The name of the tester who retrieved the electret.
- (3) *Known exposure measurements (spikes).*
- (i) Spikes shall be conducted at a rate of 3 for each 100 test devices deployed, with a minimum of 3 spikes for each certification year when tests were conducted in the certification year, and with a maximum of 6 spikes each month.
  - (ii) Spikes shall be analyzed in the same manner as all other testing.
  - (iii) Spikes shall be monitored using a means control chart. The means control chart must be established as follows:
    - (A) Using an RPE value of plus and minus 10%, which corresponds to the 1 sigma level.
    - (B) A warning level of the RPE of plus and minus 20%, which corresponds to the 2 sigma warning level.
    - (C) Control limits of the RPE of plus and minus 30%, which corresponds to the 3 sigma control level.
  - (iv) The control and warning levels identified in subparagraph (iii) shall be adjusted when the RPE of at least 20 spike results have been calculated. The standard deviation of the 20 or more RPE values shall also be calculated and the warning and control limits shall be re-established on new control charts.
  - (v) Each RPE value shall be plotted on the means control chart within 1 week of return of the device from the chamber. If the RPE value is outside the 3 sigma control level, all measurements shall cease until the problem is evaluated and corrected. All evaluations shall be documented.
  - (vi) In addition to the means control chart, all spikes shall be documented on a form that contains the following:
    - (A) The radon chamber name.
    - (B) The electret serial numbers.
    - (C) The electret chamber serial numbers.
    - (D) The reference value from radon chamber.
    - (E) The measured spike value or values.
    - (F) The individual RPE results.

- (G) The certification year beginning date and end date.
  - (H) The exposure dates.
- (4) *Duplicate measurements.*
- (i) Duplicates shall be made in at least 10% of the total number of test devices deployed each month, or 50 each month, whichever is smaller.
  - (ii) The RPD shall be calculated for all duplicate results with an average of greater than or equal to 2.0 pCi/L. Two control charts must be constructed to monitor duplicate precision:
    - (A) One for duplicates when the average is greater than or equal to 4.0 pCi/L.
    - (B) One for duplicates when the average is greater than or equal to 2.0 pCi/L and less than 4.0 pCi/L.
  - (iii) Each RPD value shall be plotted on the control chart within 1 week of performing the duplicate measurement.
  - (iv) The RPD shall be tracked using control charts from “Protocols for Radon and Radon Decay Product Measurements in Homes,” EPA 402-R-92-003, May 1993, Appendix B, Exhibit B-2 and Exhibit B-3.
  - (v) For duplicates when the average is greater than or equal to 4.0 pCi/L, the following apply:
    - (A) The control level shall be set at an RPD of 14%.
    - (B) The warning level shall be set at an RPD of 28%.
    - (C) The control limit shall be set at an RPD of 36%.
  - (vi) For duplicates when the average is greater than or equal to 2.0 pCi/L and less than 4.0 pCi/L, the following apply:
    - (A) The control level shall be set at an RPD of 25%.
    - (B) The warning level shall be set at an RPD of 50%.
    - (C) The control limit shall be set at an RPD of 67%.
  - (vii) If the plotted RPD result falls outside of the control limit, the measurements shall cease until the problem is identified and corrected.
  - (viii) If the plotted RPD result falls outside of the warning level, Appendix B shall be used to determine the action to be taken.
  - (ix) Documentation of duplicates must include the following:
    - (A) The device serial numbers.
    - (B) The exposure dates.
    - (C) Each duplicate measurement result.

- (D) The RPD results.
- (5) *Electret voltage drift.* The tester shall maintain documentation that electret voltage drift testing has been performed as follows:
  - (i) For each new shipment of 20 electrets or fewer, a minimum of 1 electret shall be set aside from each new shipment and evaluated for voltage drift.
  - (ii) For each new shipment of more than 20 electrets, a minimum of 5% of the electrets or 10 electrets, whichever number is smaller, shall be evaluated for voltage drift.
  - (iii) Electrets shall be covered with protective caps in a low-radon environment.
  - (iv) For short-term and long-term electrets, an initial and a final voltage reading shall be made.
    - (A) For short-term electrets the final voltage reading shall be made at 4 weeks.
    - (B) For long-term electrets the final voltage reading shall be made at 3 months.
  - (v) If the short-term voltage loss is greater than 6 volts per month or if the long-term voltage loss is greater than 12 volts over a 3-month period, testing with this shipment may not occur until the voltage loss is corrected.
  - (vi) Documentation of electret voltage drift must include the following:
    - (A) Whether it is a short- or long-term electret.
    - (B) The date of receipt of the new shipment.
    - (C) The electret serial number.
    - (D) Initial voltages and dates.
    - (E) Final voltages and dates.
    - (F) The reader serial number.
    - (G) Corrective actions performed.
- (6) *Voltmeter routine instrument checks.*
  - (i) Proper operation of the surface voltmeter shall be monitored following the manufacturer's procedures for zeroing the voltmeter and analyzing the reference electrets.
  - (ii) A voltage reading of a reference electret difference of more than 2 volts from its specified value shall be considered a wrong reading and corrective action shall be taken.
  - (iii) If the voltmeter displays more than (+/-) 3 volts, corrective action shall be taken.

- (iv) Voltmeter checks shall be conducted at least once each week while the voltmeter is in use and shall be documented. Documentation of routine instrument checks must include the following:
  - (A) The reader serial number.
  - (B) The date of analysis.
  - (C) Zero value.
  - (D) The reference electret values.
  - (E) Corrective actions performed.

**§ 240.605. Quality assurance requirements for testing using secondary devices.**

- (a) *Continuous radon monitors (CRMs) for secondary testers.*
  - (1) *Calibration.* Each Department-listed CRM must have a current calibration. To have a current calibration, the CRM shall be calibrated in a Department-approved calibration facility within 1 year from the date of the previous calibration and when alterations or repairs are made to the CRM. A current calibration certificate shall be retained for each monitor.
  - (2) *Check source counting.* For a CRM with a check source, check source counting shall be documented and completed with that check source prior to each test.
  - (3) *Routine instrument checks.* Before and after each measurement, the CRM shall be checked according to the manufacturer's instructions. For each check, the following shall be verified:
    - (i) The correct input parameters and the unit's clock or timer are set properly.
    - (ii) The pump's flow rates are within the range of the manufacturer's specifications.
  - (4) *Data collection log.*
    - (i) CRM data shall be tracked on a form that contains the following:
      - (A) The CRM serial number.
      - (B) The exposure dates, times and temperatures.
      - (C) The test result.
      - (D) The address of the building tested.
      - (E) The test location in the building.
      - (F) The name of the tester who placed the CRM.
      - (G) The name of the tester who retrieved the CRM.
      - (H) The calibration, repair and Department listing dates.



- (ii) For a CRM without a radioactive check source, the data collection log shall also contain the following intercomparison measurement information:
  - (A) The intercomparison device serial number.
  - (B) The RPE value or RPD value.
  - (C) The intercomparison measurement result.
- (5) *Intercomparison measurements.* An intercomparison measurement shall be performed for each CRM without a radioactive check source.
  - (i) Intercomparison measurements shall be made at least every 10<sup>th</sup> test with another Department-listed passive device that is analyzed by a Department-certified laboratory or with another CRM with a hard copy printout. The intercomparison measurements shall be distributed systematically throughout the entire population of test locations. Original printouts or Department certified laboratory results, or both, shall be kept for each intercomparison. Each intercomparison measurement must be performed with the devices side by side for the measurement for at least 48 hours.
  - (ii) When performing intercomparison measurements, the RPD shall be used to track performance. The RPD value shall be tracked using control charts from “Protocols for Radon and Radon Decay Product Measurements in Homes,” EPA 402-R-92-003, May 1993, Appendix B, Exhibit B-2 and Exhibit B-3.
  - (iii) If the RPD value exceeds the control limit, the CRM may not be used for radon measurements until the problem is identified and corrected. If the RPD value exceeds the warning level, the criteria in the “Protocols for Radon and Radon Decay Product Measurements in Homes,” EPA 402-R-92-003, May 1993, Appendix B, Exhibit B-5, shall be followed.
  - (iv) In addition to the control charts, all intercomparison measurements shall be documented on the CRM data collection log.
- (b) *Continuous working level monitor for secondary testers.*
  - (1) *Calibration.* Each Department-listed CWLM must have a current calibration. To have a current calibration, the CWLM shall be calibrated in a Department-approved calibration facility within 1 year from the date of the previous calibration and when alterations or repairs are made to the CWLM. A current calibration certificate shall be retained for each monitor.
  - (2) *Data collection log.*
    - (i) CWLM data shall be tracked on a form that contains the following:
      - (A) The CWLM serial number.
      - (B) The exposure dates, times and temperatures.
      - (C) The test result.
      - (D) The address of the building tested.
      - (E) The test location in the building.

- (F) The name of the tester who placed the CWLM.
  - (G) The name of the tester who retrieved the CWLM.
  - (H) The calibration, repair and Department listing dates.
- (ii) For CWLMs without a radioactive check source, the data collection log shall also contain the following intercomparison measurement information:
- (A) The intercomparison device serial number.
  - (B) The RPD value.
  - (C) The intercomparison measurement result.
- (3) *Intercomparison measurements.* An intercomparison measurement shall be performed for all CWLM monitors without a radioactive check source.
- (i) A CWLM without radioactive check source capability shall have an informal intercomparison measurement made with another CWLM with a hard copy printout at least every 10<sup>th</sup> test. This printout must be retained for each intercomparison. The intercomparison measurements shall be distributed systematically throughout the entire population of test locations. Each intercomparison measurement must be performed with the devices side by side for the measurement for at least 48 hours.
  - (ii) Each intercomparison shall be documented on the data collection log.
  - (iii) When performing intercomparison measurements, the RPD shall be used to track performance. The RPD value shall be tracked using control charts from “Protocols for Radon and Radon Decay product measurements in Homes,” EPA 402-R-92-003, May 1993, Appendix B, Exhibit B-2 and Exhibit B-3.
  - (iv) If the RPD value exceeds the control limit, the CRM may not be used for radon measurements until the problem is identified and corrected. If the RPD value exceeds the warning level, the criteria in the “Protocols for Radon and Radon Decay Product Measurements in Homes,” EPA 402-R-92-003, May 1993, Appendix B, Exhibit B-5, shall be followed.
- (c) *Electret ion chambers for secondary testers.*
- (1) *Data collection log.* Electret data shall be tracked on a form that contains the following:
- (i) The electret serial number.
  - (ii) The electret chamber serial number.
  - (iii) The initial voltage reading.
  - (iv) The final voltage reading.
  - (v) The exposure dates, times and temperatures.
  - (vi) The test results.
  - (vii) The serial number of duplicate electret.

- (viii) The RPD value.
- (ix) The address of the building tested.
- (x) The test location in the building.
- (xi) The name of the tester who placed the electret.
- (xii) The name of the tester who retrieved the electret.
- (2) *Known exposure measurements (spikes).*
  - (i) Spikes shall be conducted at a rate of 3 for each 100 test devices deployed, with a minimum of 3 spikes for each certification year when tests were conducted in the certification year, and with a maximum of 6 spikes each month.
  - (ii) Spikes shall be submitted to a Department-certified laboratory labeled as quality assurance. The reference value of the spiked device may not be revealed to the laboratory prior to analysis.
  - (iii) Spikes shall be monitored using a means control chart. The means control chart must be established as follows:
    - (A) Using an RPE value of plus and minus 10%, which corresponds to the 1 sigma level.
    - (B) A warning level of the RPE of plus and minus 20%, which corresponds to the 2 sigma warning level.
    - (C) Control limits of the RPE of plus and minus 30%, which correspond to the 3 sigma control level.
  - (iv) The control and warning levels identified in subparagraph (iii) shall be adjusted when the RPE of at least 20 spike results have been calculated. The standard deviation of the 20 or more RPE values shall also be calculated and the warning and control limits shall be re-established on new control charts.
  - (v) Each RPE value shall be plotted on the means control chart within 1 week of return of the device from the chamber. If the RPE value is outside the 3 sigma control level, all measurements shall cease until the problem is evaluated and corrected. All evaluations shall be documented.
  - (vi) In addition to the means control chart, all spikes shall be documented on a form that contains the following:
    - (A) The radon chamber name.
    - (B) The electret serial numbers.
    - (C) The electret chamber serial numbers.
    - (D) The reference value from radon chamber.
    - (E) The measured spike value or values.
    - (F) The individual RPE results.

- (G) The certification year beginning date and end date.
  - (H) The exposure dates.
- (3) *Duplicate measurements.*
- (i) Duplicates shall be made in at least 10% of the total number of test devices deployed each month, or 50 each month, whichever is smaller.
  - (ii) The RPD shall be calculated for all duplicate results with an average of greater than or equal to 2.0 pCi/L. Two control charts must be constructed to monitor duplicate precision:
    - (A) One for duplicates when the average is greater than or equal to 4.0 pCi/L.
    - (B) One for duplicates when the average is greater than or equal to 2.0 pCi/L and less than 4.0 pCi/L.
  - (iii) Each RPD value shall be plotted on the control chart within 1 week of performing the duplicate measurement.
  - (iv) The RPD shall be tracked using control charts from “Protocols for Radon and Radon Decay Product Measurements in Homes,” EPA 402-R-92-003, May 1993, Appendix B, Exhibit B-2 and Exhibit B-3.
  - (v) For duplicates when the average is greater than or equal to 4.0 pCi/L, the following apply:
    - (A) The control level shall be set at an RPD of 14%.
    - (B) The warning level shall be set at an RPD of 28%.
    - (C) The control limit shall be set at an RPD of 36%.
  - (vi) For duplicates when the average is greater than or equal to 2.0 pCi/L and less than 4.0 pCi/L, the following apply:
    - (A) The control level shall be set at an RPD of 25%.
    - (B) The warning level shall be set at an RPD of 50%.
    - (C) The control limit shall be set at an RPD of 67%.
  - (vii) If the plotted RPD result falls outside of the control limit, the measurements shall cease until the problem is identified and corrected.
  - (viii) If the plotted RPD result falls outside of the warning level, Appendix B shall be used to determine the action to be taken.
  - (ix) Documentation of duplicates must include the following:
    - (A) The device serial numbers.
    - (B) The exposure dates.
    - (C) Each duplicate measurement result.

(D) The RPD results.

(d) *Liquid scintillation (LS), activated charcoal (AC) and alpha tracks (AT) for secondary testers.*

(1) *Data collection log.* Detector data shall be tracked on a form that contains the following:

- (i) The device serial number.
- (ii) The serial number of duplicate devices.
- (iii) The serial number of spiked devices.
- (iv) The exposure dates, times, and temperatures.
- (v) The test results.
- (vi) The RPE value or RPD value.
- (vii) The address of the building tested.
- (viii) The test location in building.
- (ix) The name of the tester who placed the device.
- (x) The name of the tester who retrieved the device.
- (xi) The name of the laboratory to which device was sent.

(2) *Known exposure measurements (spikes).*

- (i) Spikes shall be conducted at a rate of 3 for each 100 test devices deployed, with a minimum of 3 spikes for each certification year when tests were conducted in the certification year, and with a maximum of 6 spikes each month.
- (ii) Spikes shall be submitted to a Department-certified laboratory labeled as QA. The reference value of the spiked device may not be revealed to the laboratory prior to analysis.
- (iii) Spikes shall be monitored using a means control chart. The means control chart must be established as follows:
  - (A) Using an RPE value of plus and minus 10%, which corresponds to the 1 sigma level.
  - (B) A warning level of the RPE of plus and minus 20%, which corresponds to the 2 sigma warning level.
  - (C) Control limits of the RPE of plus and minus 30%, which correspond to the 3 sigma control level.
- (iv) The control and warning levels identified in subparagraph (iii) shall be adjusted when the RPE of at least 20 spike results has been calculated. The standard deviation of the 20 or more RPE values shall also be calculated and the warning and control limits shall be re-established on new control charts.

- (v) Each RPE value shall be plotted on the means control chart within 1 week of receiving the result from the laboratory. If the RPE value is outside the 3 sigma control level, all measurements shall cease until the problem is evaluated and corrected. All evaluations shall be documented.
- (vi) In addition to the means control chart, all spikes shall be documented on a form that contains the following:
  - (A) The radon chamber name.
  - (B) The device serial numbers
  - (C) The reference value from radon chamber.
  - (D) The measured spike value or values.
  - (E) The individual RPE results.
  - (F) The certification year beginning date and end date.
  - (G) The exposure dates.
- (3) *Duplicate measurements.*
  - (i) Duplicates shall be made in at least 10% of the total number of test devices deployed each month, or 50 each month, whichever is smaller.
  - (ii) The RPD shall be calculated for all duplicate results with an average of greater than or equal to 2.0 pCi/L. Two control charts must be constructed to monitor duplicate precision:
    - (A) One for duplicates when the average is greater than or equal to 4.0 pCi/L.
    - (B) One for duplicates when the average is greater than or equal to 2.0 pCi/L and less than 4.0 pCi/L.
  - (iii) Each RPD value shall be plotted on the control chart within 1 week of performing the duplicate measurement.
  - (iv) The RPD shall be tracked using control charts from “Protocols for Radon and Radon Decay Product Measurements in Homes,” EPA 402-R-92-003, May 1993, Appendix B, Exhibit B-2 and Exhibit B-3.
  - (v) For duplicates when the average is greater than or equal to 4.0 pCi/L, the following apply:
    - (A) The control level shall be set at an RPD of 14%.
    - (B) The warning level shall be set at an RPD of 28%.
    - (C) The control limit shall be set at an RPD of 36%.
  - (vi) For duplicates when the average is greater than or equal to 2.0 pCi/L and less than 4.0 pCi/L, the following apply:
    - (A) The control level shall be set at an RPD of 25%.

- (B) The warning level shall be set at an RPD of 50%.
- (C) The control limit shall be set at an RPD of 67%.
- (vii) If the plotted RPD result falls outside of the control limit, the measurements shall cease until the problem is identified and corrected.
- (viii) If the plotted RPD result falls outside of the warning level, "Protocols for Radon and Radon Decay Product Measurements in Homes," EPA 402-R-92-003, May 1993, Appendix B shall be used to determine the action to be taken.
- (ix) Documentation of duplicates must include the following:
  - (A) The device serial numbers.
  - (B) The exposure dates.
  - (C) Each duplicate measurement result.
  - (D) The RPD results.
- (4) *Field blank.*
  - (i) Field blank results shall be monitored and recorded. They shall be performed at a rate of 5% of the devices that are deployed each month or 25, whichever is smaller, or a minimum of 1 per certification year, unless tests are not performed. These devices shall be set aside, kept in a low-radon environment and labeled as QA when submitted to the laboratory.
  - (ii) If a field blank has a concentration greater than the lowest level of detection (LLD) as established by the laboratory, the following shall occur:
    - (A) The occurrence shall be documented and reported to the laboratory.
    - (B) The cause shall be investigated in conjunction with the laboratory and documented.
  - (iii) Documentation of field blanks must include the following:
    - (A) The device serial numbers.
    - (B) The date submitted to laboratory.
    - (C) The measurement results.
    - (D) The laboratory's reported LLD.

**§ 240.606. Quality assurance (QA) requirements for laboratories.**

- (a) *Continuous radon monitors (CRMs) for laboratories.*
  - (1) *Calibration.* Each Department-listed CRM must have a current calibration. To have a current calibration, the CRM shall be calibrated in a Department-approved calibration facility within 1 year from the date of the previous calibration and when alterations or repairs are made to the CRM. A current calibration

certificate shall be retained for each monitor. Analysis may not be performed on a monitor that was not calibrated during any portion of the testing period.

(2) *Data collection log.* CRM data shall be tracked on a form that contains the following:

- (i) The CRM serial number.
- (ii) The exposure dates, times, and temperatures.
- (iii) The test result.
- (iv) The address of the building tested.
- (v) The test location in the building.
- (vi) The name of the tester who placed the CRM.
- (vii) The name of the tester who retrieved the CRM.
- (viii) The calibration, repair and Department listing dates.

(b) *Continuous working level monitors (CWLM) for laboratories.*

(1) *Calibration.* Each Department-listed CWLM must have a current calibration. To have a current calibration, the CWLM shall be calibrated in a Department-approved calibration facility within 1 year from the date of the previous calibration and when alterations or repairs are made to the CWLM. A current calibration certificate shall be retained for each monitor. Analysis may not be performed on a monitor that was not calibrated during any portion of the testing period.

(2) *Data collection log.* CWLM data shall be tracked on a form that contains the following:

- (i) The CWLM serial number.
- (ii) The exposure dates, times, and temperatures.
- (iii) The test result.
- (iv) The address of the building tested.
- (v) The test location in the building.
- (vi) The name of the tester who placed the CWLM.
- (vii) The name of the tester who retrieved the CWLM.
- (viii) The calibration, repair and Department listing dates.

(c) *Electret ion chamber for laboratory analysis.*

(1) *Calibration.* Each Department-listed electret reader shall have a current calibration. To have a current calibration, the electret reader shall be calibrated in a Department-approved calibration facility within 1 year from the date of the previous calibration and when alterations or repairs are made to the electret reader. Each electret reader shall be calibrated simultaneously with its corresponding reference electret's recertification.



(2) *Voltmeter routine instrument checks.*

- (i) Proper operation of the surface voltmeter shall be monitored following the manufacturer's procedures for zeroing the voltmeter and analyzing the reference electrets.
- (ii) A voltage reading of a reference electret difference of more than 2 volts from its specified value shall be considered a wrong reading and corrective action shall be taken.
- (iii) If the voltmeter displays more than (+/-) 3 volts, corrective action shall be taken.
- (iv) Voltmeter checks shall be conducted at least once each week while the voltmeter is in use and shall be documented. Documentation of routine instrument checks must include the following:
  - (A) The reader serial number.
  - (B) The date of analysis.
  - (C) Zero value.
  - (D) The reference electret values.
  - (E) Corrective actions performed.

(3) *Known exposure measurements (spikes).*

- (i) Spikes shall be conducted at a rate of 3 for each 100 test devices deployed, with a minimum of 3 spikes for each certification year when tests were conducted in the certification year, and with a maximum of 6 spikes each month.
- (ii) Spikes shall be analyzed in the same manner as all other testing.
- (iii) Spikes shall be monitored using a means control chart. The means control chart must be established as follows:
  - (A) Using an RPE value of plus and minus 10%, which corresponds to the 1 sigma level.
  - (B) A warning level of the RPE of plus and minus 20%, which corresponds to the 2 sigma warning level.
  - (C) Control limits of the RPE of plus and minus 30%, which correspond to the 3 sigma control level.
- (iv) The control and warning levels identified in subparagraph (iii) shall be adjusted when the RPE of at least 20 spike results has been calculated. The standard deviation of the 20 or more RPE values shall also be calculated and the warning and control limits shall be re-established on new control charts.
- (v) Each RPE value shall be plotted on the means control chart within 1 week of return of the device from the radon chamber. If the RPE value is outside the 3 sigma control level, all measurements shall cease until the problem is evaluated and corrected. All evaluations shall be documented.

(vi) In addition to the means control chart, all spikes shall be documented on a form that contains the following:

- (A) The radon chamber name.
- (B) The electret serial numbers.
- (C) The reference value from radon chamber.
- (D) The measured spike value or values.
- (E) The individual RPE results.
- (F) The certification year beginning date and end date.
- (G) The exposure dates.

*(4) Duplicate measurements.*

(i) Duplicates shall be made in at least 10% of the total number of test devices deployed each month, or 50 each month, whichever is smaller.

(ii) The RPD shall be calculated for all duplicate results with an average of greater than or equal to 2.0 pCi/L. Two control charts must be constructed to monitor duplicate precision:

- (A) One for duplicates when the average is greater than or equal to 4.0 pCi/L.
- (B) One for duplicates when the average is greater than or equal to 2.0 pCi/L and less than 4.0 pCi/L.

(iii) Each RPD value shall be plotted on the control chart within 1 week of performing the duplicate measurement.

(iv) The RPD shall be tracked using control charts from "Protocols for Radon and Radon Decay Product Measurements in Homes," EPA 402-R-92-003, May 1993, Appendix B, Exhibit B-2 and Exhibit B-3.

(v) For duplicates when the average is greater than or equal to 4.0 pCi/L, the following apply:

- (A) The control level shall be set at an RPD of 14%.
- (B) The warning level shall be set at an RPD of 28%.
- (C) The control limit shall be set at an RPD of 36%.

(vi) For duplicates when the average is greater than or equal to 2.0 pCi/L and less than 4.0 pCi/L, the following apply:

- (A) The control level shall be set at an RPD of 25%.
- (B) The warning level shall be set at an RPD of 50%.
- (C) The control limit shall be set at an RPD of 67%.

(vii) If the plotted RPD result falls outside of the control limit, the measurements shall cease until the problem is identified and corrected.

(viii) If the plotted RPD result falls outside of the warning level, Appendix B shall be used to determine the action to be taken.

(ix) Documentation of duplicates must include the following:

- (A) The device serial numbers.
- (B) The exposure dates.
- (C) Each duplicate measurement result.
- (D) The RPD results.

(5) *Electret voltage drift.*

(i) For shipments of 20 electrets or fewer, a minimum of 1 electret shall be set aside from each new shipment and evaluated for voltage drift.

(ii) For shipments of more than 20 electrets, a minimum of 5% of the electrets or 10 electrets, whichever number is smaller, shall be evaluated for voltage drift.

(iii) Electrets shall be covered with protective caps in a low-radon environment.

(iv) For short-term and long-term electrets, an initial and a final voltage reading shall be made.

(A) For short-term electrets the final voltage reading shall be made at 4 weeks.

(B) For long-term electrets the final voltage reading shall be made at 3 months.

(v) If the short-term voltage loss is greater than 6 volts per month or if the long-term voltage loss is greater than 12 volts over a 3-month period, testing with this shipment may not occur until the voltage loss is corrected.

(vi) Documentation of electret voltage drift must include the following:

- (A) Whether it is a short- or long-term electret.
- (B) The date of receipt of the new shipment.
- (C) The electret serial number.
- (D) Initial voltages and dates.
- (E) Final voltages and dates.
- (F) The reader serial number.
- (G) Corrective actions performed.

(d) *Activated charcoal (AC) and liquid scintillation (LS).*

(1) *Calibration.* All AC or LS laboratory systems shall be calibrated at least once every 12 months, when alterations or repairs are made to the system, or when a new batch of charcoal is received. This requires a determination of calibration factors for AC and LS devices by the exposure of these devices to known concentration of radon in a DEP-approved radon chamber. Calibration factors shall be determined for a range of exposure times and humidity levels.

(2) *Laboratory control devices.* The laboratory background level for each batch of AC/LS devices shall be established by each laboratory. Laboratories shall measure the background of at least 5% of unexposed AC and LS devices that have been processed according to their standard operating procedures (laboratory blanks).

(3) *Routine counting system checks.* Daily counting of a reference source shall be performed and documented. The characteristics of the check source (geometry, type of radiation emitted, and the like) must be similar to the samples to be analyzed. The count rate of the check sources must be high enough to yield reliable counting statistics in a short period of time, such as 1,000 to 10,000 counts per minute, to provide a maximum random uncertainty of 5%.

(4) *Known exposure measurements (spikes).*

(i) Spikes shall be conducted at a rate of 3 for each 100 test devices deployed, with a minimum of 3 spikes for each certification year when tests were conducted in the certification year, and with a maximum of 6 spikes each month.

(ii) Spikes shall be analyzed in the same manner as all other testing.

(iii) Spikes shall be monitored using a means control chart. The means control chart must be established as follows:

(A) Using an RPE value of plus and minus 10%, which corresponds to the 1 sigma level.

(B) A warning level of the RPE of plus and minus 20%, which corresponds to the 2 sigma warning level.

(C) Control limits of the RPE of plus and minus 30%, which correspond to the 3 sigma control level.

(iv) The control and warning levels identified in subparagraph (iii) shall be adjusted when the RPE of at least 20 spike results has been calculated. The standard deviation of the 20 or more RPE values shall also be calculated and the warning and control limits shall be re-established on new control charts.

(v) Each RPE value shall be plotted on the means control chart within 1 week of receiving the result from the laboratory. If the RPE value is outside the 3 sigma control level, all measurements shall cease until the problem is evaluated and corrected. All evaluations shall be documented.

(vi) In addition to the means control chart, all spikes shall be documented on a form that contains the following:

(A) The radon chamber name.

- (B) The device serial numbers.
- (C) The reference value from radon chamber.
- (D) The measured spike value or values.
- (E) The individual RPE results.
- (F) The certification year beginning date and end date.
- (G) The exposure dates.

(5) *Duplicate measurements.*

(i) Duplicates shall be made in at least 10% of the total number of test devices deployed each month, or 50 each month, whichever is smaller.

(ii) The RPD shall be calculated for all duplicate results with an average of greater than or equal to 2.0 pCi/L. Two control charts must be constructed to monitor duplicate precision:

(A) One for duplicates when the average is greater than or equal to 4.0 pCi/L.

(B) One for duplicates when the average is greater than or equal to 2.0 pCi/L and less than 4.0 pCi/L.

(iii) Each RPD value shall be plotted on the control chart within 1 week of performing the duplicate measurement.

(iv) The RPD shall be tracked using control charts from “Protocols for Radon and Radon Decay Product Measurements in Homes,” EPA 402-R-92-003, May 1993, Appendix B, Exhibit B-2 and Exhibit B-3.

(v) For duplicates when the average is greater than or equal to 4.0 pCi/L, the following apply:

(A) The control level shall be set at an RPD of 14%.

(B) The warning level shall be set at an RPD of 28%.

(C) The control limit shall be set at an RPD of 36%.

(vi) For duplicates when the average is greater than or equal to 2.0 pCi/L and less than 4.0 pCi/L, the following apply:

(A) The control level shall be set at an RPD of 25%.

(B) The warning level shall be set at an RPD of 50%.

(C) The control limit shall be set at an RPD of 67%.

(vii) If the plotted RPD result falls outside of the control limit, the measurements shall cease until the problem is identified and corrected.

(viii) If the plotted RPD result falls outside of the warning level, “Protocols for Radon and Radon Decay Product Measurements in Homes,” EPA 402-R-92-003, May 1993, Appendix B shall be used to determine the action to be taken.

(ix) Documentation of duplicates must include the following:

- (A) The device serial numbers.
- (B) The exposure dates.
- (C) Each duplicate measurement result.
- (D) The RPD results.

(e) *Alpha tracks.*

(1) *Calibration.* All AT laboratory systems shall be calibrated at least once every 12 months, when alterations or repairs are made to the system, or when each new batch or sheet of detector material is received. This requires a determination of calibration factors for AT devices by the exposure of these devices to different concentrations of radon in a DEP-approved radon chamber.

(2) *Laboratory control detectors.* Laboratory control detectors for each batch of ATs shall be established and documented. Each laboratory shall measure the background of a statistically significant number of unexposed ATs. The laboratory control background value shall be subtracted from the field readings to produce a final result.

(3) *Known exposure measurements (spikes).*

(i) Spikes shall be conducted at a rate of 3 for each 100 test devices deployed, with a minimum of 3 spikes for each certification year when tests were conducted in the certification year, and with a maximum of 6 spikes each month.

(ii) Spikes shall be analyzed in the same manner as all other testing. The reference value of a spike may not be revealed to the laboratory prior to analysis.

(iii) Spikes shall be monitored using a means control chart. The means control chart must be established as follows:

(A) Using an RPE value of plus and minus 10%, which corresponds to the 1 sigma level.

(B) A warning level of the RPE of plus and minus 20%, which corresponds to the 2 sigma warning level.

(C) Control limits of the RPE of plus and minus 30%, which correspond to the 3 sigma control level.

(iv) The control and warning levels identified in subparagraph (iii) shall be adjusted when the RPE of at least 20 spike results has been calculated. The standard deviation of the 20 or more RPE values shall also be calculated and the warning and control limits shall be re-established on new control charts.

(v) Each RPE value shall be plotted on the means control chart within 1 week of receiving the result from the laboratory. If the RPE value is outside the 3 sigma control level, all measurements shall cease until the problem is evaluated and corrected. All evaluations shall be documented.

(vi) In addition to the means control chart, all spikes shall be documented on a form that contains the following:

- (A) The radon chamber name.
- (B) The device serial numbers.
- (C) The reference value from radon chamber.
- (D) The measured spike value or values.
- (E) The individual RPE results.
- (F) The certification year beginning date and end date.
- (G) The exposure dates.

(4) *Duplicate measurements.*

(i) Duplicates shall be made in at least 10% of the total number of test devices deployed each month, or 50 each month, whichever is smaller.

(ii) The RPD shall be calculated for all duplicate results with an average of greater than or equal to 2.0 pCi/L. Two control charts must be constructed to monitor duplicate precision:

- (A) One for duplicates when the average is greater than or equal to 4.0 pCi/L.
- (B) One for duplicates when the average is greater than or equal to 2.0 pCi/L and less than 4.0 pCi/L.

(iii) Each RPD value shall be plotted on the control chart within 1 week of performing the duplicate measurement.

(iv) The RPD shall be tracked using control charts from “Protocols for Radon and Radon Decay Product Measurements in Homes,” EPA 402-R-92-003, May 1993, Appendix B, Exhibit B-2 and Exhibit B-3.

(v) For duplicates when the average is greater than or equal to 4.0 pCi/L, the following apply:

- (A) The control level shall be set at an RPD of 14%.
- (B) The warning level shall be set at an RPD of 28%.
- (C) The control limit shall be set at an RPD of 36%.

(vi) For duplicates when the average is greater than or equal to 2.0 pCi/L and less than 4.0 pCi/L, the following apply:

- (A) The control level shall be set at an RPD of 25%.
- (B) The warning level shall be set at an RPD of 50%.
- (C) The control limit shall be set at an RPD of 67%.

(vii) If the plotted RPD result falls outside of the control limit, the measurements shall cease until the problem is identified and corrected.

(viii) If the plotted RPD result falls outside of the warning level, Appendix B shall be used to determine the action to be taken.

(ix) Documentation of duplicates shall include the following:

- (A) The device serial numbers.
- (B) The exposure dates.
- (C) Each duplicate measurement result.
- (D) The RPD results.



**(Editor's Note: Appendix A is proposed for revision in a separate rulemaking.)**

## **APPENDIX A**

### **Radon Certification Fee Schedule**

Testing Individual	\$350 every 2 years
Testing Employee	\$100 every 2 years
Testing Firm	\$700 every 2 years
Mitigation Individual	\$300 every 2 years
Mitigation Firm	\$700 every 2 years
Laboratory Individual	\$400 every 2 years
Laboratory Firm	\$750 every 2 years
Primary Testing Device Listing	\$100 every 2 years (1)
Course Provider	\$375 every 2 years (2)
Late Application Renewal	\$100
Late 45-Day Reporting	\$100 (3)

The Department will review the adequacy of the fees established in this schedule at least once every 3 years and provide a written report to the EQB. The report must identify any disparity between the amount of program income generated by the fees and the costs to administer these programs, and must contain recommendations to increase fees to eliminate the disparity, including recommendations for regulatory amendments to increase program fees.

- (1) Primary radon testers shall submit the Primary Testing Device Fee as specified in the Radon Certification Fee Schedule for each device they read or analyze, or both.
- (2) A person approved by the Department to provide initial or continuing, or both, education courses shall submit the Course Provider Fee as specified in this appendix.
- (3) Anyone not submitting the required 45-day testing or mitigation, or both, reporting within 90 days of the completion of the testing or mitigation, or both, activity (or if no activities have been performed during this period of informing the Department of same in writing) will be subject to the Late 45-Day Reporting Fee as specified in this appendix.

## Appendix B

### Non-interference Agreement for Real Estate Radon Testing

Property name:  
Property address:  
Property city, state, zip:  
Dates of test:

I hereby agree to abide by the following conditions to ensure a valid radon test result:

- 1) I will maintain closed house conditions during the entire test period, and for 12 hours prior to any test of less than 96 hours, by doing the following:
  - Continuing normal operation of permanently installed HVAC systems.
  - Minimizing operation of dryers, range hoods, bathroom fans and other mechanical systems, understanding that drawing air out of the building may adversely affect the test results.
  - In buildings having permanently installed radon mitigation systems, keeping the mitigation system functioning during the testing interval.
  - Operating window air conditioning systems if set to recycle interior air.
  - Keeping all windows closed.
  - Keeping all external doors closed except for normal entry and exit.
  - Not operating whole-house fans. Removing portable window fans from the window or covering and sealing the window fan.
  - Not operating fireplaces, wood/coal stoves or combustion appliances, except water heaters and cooking appliances, unless they are the primary sources of heat for the building.
  - Not operating ceiling fans, portable dehumidifiers, portable humidifiers, portable air filters and window air conditioners within 20 feet of the detector.
- 2) I will not interfere with or move the radon test device.

If the certified tester determines that these conditions were not maintained, this test will be deemed invalid.

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Signature of Person  
in Control of Property

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Printed Name of Person  
in Control of Property

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Date