

1 **216-RICR-40-20-11**

2 **TITLE 216 – DEPARTMENT OF HEALTH**

3 **CHAPTER 40 – PROFESSIONAL LICENSING & FACILITIES REGULATION**

4 **SUBCHAPTER 20 - RADIATION**

5 **PART 11 – LICENSES FOR WELL LOGGING AND RADIATION SAFETY**
6 **REQUIREMENTS FOR WELL LOGGING OPERATIONS**

7 **11.1 Authority**

- 8 A. This Part is promulgated pursuant to the authority conferred under R.I. Gen.
9 Laws § [23-1.3-5\(f\)](#), as amended.
- 10 B. This Part prescribes requirements for the issuance of a license or registration
11 authorizing the use of sources of radiation in well logging in a single well. This
12 Part also prescribes radiation safety requirements for persons using sources of
13 radiation in these operations.
- 14 C. This Part applies to all licensees or registrants who use sources of radiation for
15 well logging operations including mineral logging, radioactive markers, or
16 subsurface tracer studies.
- 17 D. The requirements set out in this Part do not apply to the issuance of a license or
18 registration authorizing the use of sources of radiation in tracer studies involving
19 multiple wells, such as field flooding studies, or to the use of sources of radiation
20 auxiliary to well logging but not lowered into wells.
- 21 E. The provisions and requirements of this Part are in addition to, and not in
22 substitution for, other requirements of this Subchapter.

23 **11.2 Incorporated Material**

- 24 A. Except as provided in this Part, the requirements of 10 CFR Part 39 (2018)
25 <https://www.nrc.gov/reading-rm/doc-collections/cfr/part039/> are incorporated by
26 reference, not including any further editions or amendments thereof and only to
27 the extent that the provisions therein are not inconsistent with this Part.
- 28 B. Notwithstanding the provisions of § 11.2(A) of this Part, §§ 39.5, 39.8, 39.11,
29 39.13, 39.17, 39.51, 39.53, 39.55, 39.73, 39.75, 39.77, 39.91, 39.101 and 39.103
30 are not incorporated by reference.
- 31 C. Effect of incorporation of 10 CFR Part 39. To reconcile differences between this
32 Part and the incorporated sections of 10 CFR Part 39, the following words and
33 phrases shall be substituted for the language in 10 CFR Part 39 as follows:

- 1 1. Any reference to NRC or Commission shall be deemed to be a reference
2 to the Agency.
- 3 2. Any reference to NRC or agreement state shall be deemed to be a
4 reference to the Agency, NRC or agreement state.
- 5 3. Any reference to byproduct material shall be deemed to be a reference to
6 radioactive material.
- 7 4. Any notifications, reports or correspondence referenced in the
8 incorporated sections of 10 CFR Part 39 shall be directed to the Agency
9 using contact information specified in § 1.4 of this Part.

10 **11.3 Definitions**

- 11 A. In addition to the definitions contained in 10 CFR § 39.2, whenever used in this
12 Part, the following terms shall be construed as follows:

13 “Act” means Title 23, Chapter 1.3 of the General Laws of the State of Rhode
14 Island entitled "Radiation Control".

15 “Agency” means Rhode Island Radiation Control Agency (RCA), Center for
16 Health Facilities Regulation - Radiation Control Program, Rhode Island
17 Department of Health.

18 “Annual” means an interval not to exceed twelve (12) months.

19 “Radioactive material” means any material (solid, liquid, or gas) which emits
20 radiation spontaneously.

21 “R.I. Gen. Laws” means the General Laws of Rhode Island, as amended.

22 **11.4 Specific Licensing Requirements**

23 **11.4.1 Specific License for Well Logging**

- 24 A. In addition to the requirements set forth in § 7.6.2 of this Subchapter, a specific
25 license for use of sources of radiation in well logging will be issued if the
26 applicant submits to the Agency:

- 27 1. A description of its program for training logging supervisors and logging
28 assistants and which specifies:
 - 29 a. Initial training;
 - 30 b. On-the-job training;
 - 31 c. Annual safety reviews provided by the licensee;

- 1 d. Means the applicant will use to demonstrate the logging
2 supervisor's knowledge and understanding of and ability to comply
3 with the Agency's regulations and licensing requirements and the
4 applicant's operating and emergency procedures; and
- 5 e. Means the applicant will use to demonstrate the logging assistant's
6 knowledge and understanding of and ability to comply with the
7 applicant's operating and emergency procedures.
- 8 2. Written operating and emergency procedures as described in § 11.6.2 of
9 this Part or an outline or summary of the procedures that includes the
10 important radiation safety aspects of the procedures.
- 11 3. A program for annual inspections of the job performance of each logging
12 supervisor to ensure that the Agency's regulations, license requirements,
13 and the applicant's operating and emergency procedures are followed.
- 14 a. Inspection records must be retained for three (3) years after each
15 annual internal inspection.
- 16 4. A description of its overall organizational structure as it applies to the
17 radiation safety responsibilities in well logging, including specified
18 delegations of authority and responsibility.
- 19 5. If an applicant wants to perform leak testing of sealed sources, identify the
20 manufacturers and the model numbers of the leak test kits to be used.
- 21 6. If the applicant wants to analyze its own wipe samples, a description of the
22 procedures to be followed. The description must include:
- 23 a. Instruments to be used;
- 24 b. Methods of performing the analysis; and
- 25 c. Pertinent experience of the person who will analyze the wipe
26 samples.

27 **11.4.2 Agreement with Well Owner or Operator**

28 For the purpose of this Part, requirements for an agreement with well owner or
29 operator are defined by 10 CFR § 39.15.

30 **11.5 Equipment**

31 **11.5.1 Labels, Security, and Transportation Precautions**

32 For the purpose of this Part, requirements for labels, security, and transportation
33 precautions are defined by 10 CFR § 39.31.

1 **11.5.2 Radiation Survey Instruments**

2 For the purpose of this Part, requirements for radiation survey instruments are
3 defined by 10 CFR § 39.33.

4 **11.5.3 Leak Testing of Sealed Sources**

5 For the purpose of this Part, requirements for leak testing of sealed sources are
6 defined by 10 CFR § 39.35.

7 **11.5.4 Physical Inventory**

8 For the purpose of this Part, requirements for physical inventory are defined by
9 10 CFR § 39.37.

10 **11.5.5 Utilization Records**

11 For the purpose of this Part, requirements for utilization records are defined by
12 10 CFR § 39.39.

13 **11.5.6 Design and Performance Criteria for Sealed Sources Used in Downhole
14 Operations**

15 For the purpose of this Part, requirements for design and performance criteria for
16 sealed sources used in downhole operations are defined by 10 CFR § 39.41.

17 **11.5.7 Inspection, Maintenance, and Opening of a Source or Source Holder**

18 For the purpose of this Part, requirements for inspection, maintenance, and
19 opening of a source or source holder are defined by 10 CFR § 39.43.

20 **11.5.8 Subsurface Tracer Studies**

21 For the purpose of this Part, requirements for subsurface tracer studies are
22 defined by 10 CFR § 39.45.

23 **11.5.9 Radioactive Markers**

24 For the purpose of this Part, requirements for radioactive markers are defined by
25 10 CFR § 39.47.

26 **11.5.10 Uranium Sinker Bars**

27 For the purpose of this Part, requirements for uranium sinker bars are defined by
28 10 CFR § 39.49.

29 **11.5.11 Use of a Sealed Source in a Well Without Surface Casing**

1 A licensee may use a sealed source in a well without a surface casing for
2 protecting fresh water aquifers only if the licensee follows a procedure for
3 reducing the probability of the source becoming lodged in the well. The
4 procedure shall be approved by the Agency.

5 **11.5.12 Energy Compensation Source**

6 A. A licensee may use an energy compensation source (ECS) which is contained
7 within a logging tool, or other tool components, only if the ECS contains
8 quantities of licensed material not exceeding 3.7 MBq (100 microcuries).

9 1. For well logging applications with a surface casing for protecting fresh
10 water aquifers, use of the ECS is only subject to the requirements of §§
11 11.5.3, 11.5.4 and 11.5.5 of this Part.

12 2. For well logging applications without a surface casing for protecting fresh
13 water aquifers, use of the ECS is only subject to the requirements of §§
14 11.5.1, 11.5.3, 11.5.4, 11.5.5, 11.5.11 and 11.7.4 of this Part.

15 **11.5.13 Tritium Neutron Generator Target Source**

16 A. Use of a tritium neutron generator target source, containing quantities not
17 exceeding 1,110 MBq (30 curies) and in a well with a surface casing to protect
18 fresh water aquifers, is subject to the requirements of this Part except §§ 11.5.1,
19 11.5.6, and 11.7.4 of this Part.

20 B. Use of a tritium neutron generator target source, containing quantities exceeding
21 1,110 MBq (30 curies) or in a well without a surface casing to protect fresh water
22 aquifers, is subject to the requirements of this Part except § 11.5.6 of this Part.

23 **11.5.14 Handling Tools**

24 The licensee shall provide and require the use of tools that will assure remote
25 handling of sealed sources other than low-activity calibration sources.

26 **11.5.15 Particle Accelerators**

27 No licensee or registrant shall permit above-ground testing of particle
28 accelerators, designed for use in well-logging, which results in the production of
29 radiation, except in areas or facilities controlled or shielded so that the
30 requirements of §§ 1.7.1 and 1.8.1 of this Subchapter, as applicable, are met.

31 **11.6 Radiation Safety Requirements**

32 **11.6.1 Training**

33 For the purpose of this Part, training requirements are defined by 10 CFR §
34 39.61.

1 **11.6.2 Operating and Emergency Procedures**

2 For the purpose of this Part, requirements for operating and emergency
3 procedures are defined by 10 CFR § 39.63.

4 **11.6.3 Personnel Monitoring**

5 For the purpose of this Part, requirements for personnel monitoring are defined
6 by 10 CFR § 39.65.

7 **11.6.4 Radiation Surveys**

8 For the purpose of this Part, requirements for radiation surveys are defined by 10
9 CFR § 39.67.

10 **11.6.5 Radioactive Contamination Control**

11 For the purpose of this Part, requirements for radioactive contamination control
12 are defined by 10 CFR § 39.69.

13 **11.7 Security, Records and Notifications**

14 **11.7.1 Security**

15 For the purpose of this Part, security requirements are defined by 10 CFR §
16 39.71.

17 **11.7.2 Documents and Records Required at Field Stations**

18 A. Each licensee or registrant shall maintain, for inspection by the Agency, the
19 following documents and records for the specific devices and sources used at the
20 field station:

- 21 1. Appropriate license, certificate of registration, or equivalent document;
- 22 2. Operating and emergency procedures;
- 23 3. Applicable regulations;
- 24 4. Records of the latest survey instrument calibrations pursuant to § 11.5.2 of
25 this Part;
- 26 5. Records of the latest leak test results pursuant to § 11.5.3 of this Part;
- 27 6. Records of quarterly inventories required pursuant to § 11.5.4 of this Part;
- 28 7. Utilization records required pursuant to § 11.5.5 of this Part;

- 1 8. Records of inspection and maintenance required pursuant to § 11.5.7 of
2 this Part;
- 3 9. Survey records required pursuant to § 11.5.15 of this Part; and
- 4 10. Training records required pursuant to § 11.6.1 of this Part.

5 **11.7.3 Documents and Records Required at Temporary Jobsites**

- 6 A. Each licensee or registrant conducting operations at a temporary jobsite shall
7 have the following documents and records available at that site for inspection by
8 the Agency:
 - 9 1. Operating and emergency procedures;
 - 10 2. Survey records required pursuant to § 11.5.15 of this Part; for the period
11 of operation at the site;
 - 12 3. Evidence of current calibration for the radiation survey instruments in use
13 at the site;
 - 14 4. When operating in Rhode Island under reciprocity, a copy of the
15 appropriate license, certificate of registration, or equivalent document(s);
16 and
 - 17 5. Shipping papers for the transportation of radioactive material.

18 **11.7.4 Notification of Incidents, Abandonment, and Lost Sources**

- 19 A. Notification of incidents and sources lost in other than downhole logging
20 operations shall be made in accordance with appropriate provisions of § 1.17.2 of
21 this Subchapter.
- 22 B. Whenever a sealed source or device containing radioactive material is lodged
23 downhole, the licensee shall:
 - 24 1. monitor at the surface for the presence of radioactive contamination with a
25 radiation survey instrument or logging tool during logging tool recovery
26 operations; and
 - 27 2. notify the Agency immediately by telephone and subsequently, within thirty
28 (30) days, by confirmatory letter if the licensee knows or has reason to
29 believe that a sealed source has been ruptured. This letter shall identify
30 the well or other location, describe the magnitude and extent of the
31 escape of radioactive material, assess the consequences of the rupture,
32 and explain efforts planned or being taken to mitigate these
33 consequences.

- 1 C. When it becomes apparent that efforts to recover the radioactive source will not
2 be successful, the licensee shall:
- 3 1. Advise the well-operator of the regulations of the Agency regarding
4 abandonment and an appropriate method of abandonment, which shall
5 include:
- 6 a. the immobilization and sealing in place of the radioactive source
7 with a cement plug,
- 8 b. a means to prevent inadvertent intrusion on the source (e.g., the
9 setting of a whipstock or other deflection device), unless the source
10 is not accessible to any subsequent drilling operations, and
- 11 c. the mounting of a permanent identification plaque, at the surface of
12 the well, containing the appropriate information required by § 11.7.4
13 of this Part;
- 14 2. Notify the Agency, by telephone, of the circumstances that resulted in the
15 inability to retrieve the source, and:
- 16 a. obtain Agency approval to implement abandonment procedures; or
17 b. that the licensee implemented abandonment before receiving
18 Agency approval because the licensee believed there was an
19 immediate threat to public health and safety; and
- 20 3. File a written report with the Agency within thirty (30) days of the
21 abandonment. The licensee shall send a copy of the report to the state
22 agency(s) that issued permits or otherwise approved of the drilling
23 operation. The report shall contain the following information:
- 24 a. date of occurrence and a brief description of attempts to recover
25 the source,
- 26 b. a description of the irretrievable radioactive source involved,
27 including radionuclide, quantity, and chemical and physical form,
- 28 c. surface location and identification of well,
- 29 d. results of efforts to immobilize and set the source in place,
- 30 e. depth of the radioactive source,
- 31 f. depth of the top of the cement plug,
- 32 g. depth of the well,

- 1 h. The immediate threat to public health and safety justification for
2 implementing abandonment if prior Agency approval was not
3 obtained in accordance with § 11.7.4 of this Part.
- 4 i. any other information, such as a warning statement, contained on
5 the permanent identification plaque; and
- 6 j. the names of State and Federal agencies receiving a copy of this
7 report.
- 8 D. Whenever a sealed source containing radioactive material is abandoned
9 downhole, the licensee shall provide a permanent identification plaque for
10 mounting at the surface of the well, unless the mounting of the plaque is not
11 practical. This plaque shall:
- 12 1. be at least 17 cm (7 inches) square and 3 mm (1/8 inch) thick and be
13 constructed of long-lasting material, such as stainless steel, brass, bronze,
14 or monel, and
- 15 2. be constructed of long-lasting material, such as stainless steel or monel,
16 and
- 17 3. contain the following engraved on its face:
- 18 a. the word "CAUTION",
- 19 b. the radiation symbol without the conventional color requirement,
- 20 c. the date of abandonment,
- 21 d. the name of the well operator or well owner,
- 22 e. the well name and well identification number(s) or other
23 designation,
- 24 f. the sealed source(s) by radionuclide and quantity of activity,
- 25 g. the source depth and the depth to the top of the plug, and
- 26 h. an appropriate warning, depending on the specific circumstances of
27 each abandonment. Appropriate warnings may include:
- 28 (1) "Do not drill below plug back depth";
- 29 (2) "Do not enlarge casing"; or
- 30 (3) "Do not re-enter the hole", followed by the words, "before
31 contacting the Rhode Island Radiation Control Agency."

- 1 E. The licensee shall immediately notify the Agency by telephone and subsequently
- 2 by confirming letter if the licensee knows or has reason to believe that radioactive
- 3 material has been lost in or to an underground potable aquifer. Such notice shall
- 4 designate the well location and shall describe the magnitude and extent of loss of
- 5 radioactive material, assess the consequences of such loss, and explain efforts
- 6 planned or being taken to mitigate these consequences.