

**DRAFT 07/08/16**

**DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT**

**Hazardous Materials and Waste Management Division**

**RADIATION CONTROL - RADIATION SAFETY REQUIREMENTS FOR WELL LOGGING WIRELINE SERVICE OPERATIONS AND SUBSURFACE TRACER STUDIES**

**6 CCR 1007-1 Part 16**

**Adopted by the Board of Health July 20, 2016**

*[Editor's Notes follow the text of the rules at the end of this CCR Document.]*

**PART 16: RADIATION SAFETY REQUIREMENTS FOR WELL LOGGING WIRELINE SERVICE OPERATIONS AND SUBSURFACE TRACER STUDIES**

**16.1 Purpose and Scope.**

**16.1.1 Authority.**

Rules and regulations set forth herein are adopted pursuant to the provisions of Sections 25-1-108, 25-1.5-101(1)(l), and 25-11-104, CRS.

**16.1.2 Basis and Purpose.**

A statement of basis and purpose accompanies this part and changes to this part. A copy may be obtained from the Department.

**16.1.3 Scope.**

The regulations in this part establish radiation safety requirements for use of sources of radiation or licensed materials including sealed sources, radioactive tracers, radioactive markers, and uranium sinker bars in well logging. This part also prescribes radiation safety requirements for persons using sources of radiation or licensed materials in these operations. ~~using sources of radiation for wireline service operations including mineral logging, radioactive markers, and subsurface tracer studies.~~

**16.1.4 Applicability.**

The regulations in this part apply to all applicants, licensees or registrants who use sources of radiation for well logging or wireline service operations including mineral logging, radioactive markers, or subsurface tracer studies. The requirements of this part are in addition to, and not in substitution for, the requirements of Parts 1, 2, 3, 4, 8, 10, 17, and ~~1022~~ of these regulations.

**16.1.5 Published Material Incorporated by Reference.**

Published material incorporated in Part 16 by reference is available in accord with Part 1, Section 1.4.

**16.2 Definitions.**

As used in this part, these terms have the definitions set forth as follows.

**Comment [jsj1]:**

**EDITORIAL NOTE 1:** ALL COMMENTS (SUCH AS THIS ONE) SHOWN IN THE RIGHT SIDE MARGIN OF THIS DOCUMENT ARE FOR INFORMATION PURPOSES ONLY TO ASSIST THE READER IN UNDERSTANDING THE PROPOSED RULE DURING THE DRAFT REVIEW AND COMMENT PROCESS.

THESE COMMENTS ARE **NOT** PART OF THE RULE AND ALL COMMENTS WILL BE DELETED PRIOR TO FINAL PUBLICATION.

**EDITORIAL NOTE 2:** ALIGNMENT AND FORMATTING CORRECTIONS AND ADJUSTMENTS ARE MADE THROUGHOUT THE RULE AND MAY NOT BE SPECIFICALLY IDENTIFIED WITH A SIDE MARGIN COMMENT.

**EDITORIAL NOTE 3:** THE ACRONYM "CRCPD" REFERS TO THE CONFERENCE OF RADIATION CONTROL PROGRAM DIRECTORS (CRCPD), INC., WHICH DEVELOPS SUGGESTED STATE REGULATIONS FOR CONTROL OF RADIATION (KNOWN AS SSRCS). UNLESS OTHERWISE DETERMINED BY THE BOARD OF HEALTH, COLORADO'S RULES ARE TO BE CONSISTENT WITH BOTH NUCLEAR REGULATORY COMMISSION (NRC) REGULATIONS AND THE SSRCS REGULATIONS. DUE TO DIFFERING RULE LANGUAGE BETWEEN THE NRC RULE(S) AND THE SSRCS, IT MAY NOT BE POSSIBLE TO BE CONSISTENT WITH BOTH NRC AND CRCPD. THESE DIFFERENCES HAVE BEEN IDENTIFIED IN THE SIDE MARGIN NOTES WHEREVER POSSIBLE.

THE SSRCS MAY BE FOUND ONLINE AT: <http://www.crcpd.org/ssrcs/default.aspx>. THE ORIGINAL PART 16 RULE IS BASED ON CRCPD SSRCS PART "W" DATED 1991.

**Comment [jsj2]:** A change in the title of the rule is proposed. Well logging is a more current term.

**The incorporation of the term "well logging" is also more consistent with the title of 10 CFR Part 39 ("Licenses and radiation safety requirements for well logging").**

**Comment [JJ3]:**

This reflects the date of anticipated approval by the Colorado Board of Health and is subject to change. The effective date is approximately 60 days beyond this date, pending additional review and approvals.

**Comment [jsj4]:** Language added in 16.1.3 and 16.1.4, to be consistent with rule title change, and language of 10 CFR 39.1.

**Comment [JJ5]:** Cross-reference to additional regulatory parts consistent with 10 CFR Part 39.1. References to Part 8 (x-ray non-healing arts); Parts 10 (notices...); 17 (transportation) and Part 22 (physical security) are added. NRC RATS 2013-1; NRC Compatibility = D

36 “Energy compensation source” (ECS) means a small sealed source, with an activity not  
 37 | exceeding 3.7 MBq (100 microcuries), used within a logging tool, or other tool components, to  
 38 | provide a reference standard to maintain the tool’s calibration when in use.

39 “Field station” means a facility where radioactive sources may be stored or used and from which  
 40 | equipment is dispatched to temporary jobsites.

41 “Injection tool” means a device used for controlled subsurface injection of radioactive tracer  
 42 | material.

43 “Irretrievable well-logging source” means any sealed source containing licensed material that is  
 44 | pulled off or not connected to the wireline that suspends the source in the well and for which all  
 45 | reasonable effort at recovery has been expended.

46 “Logging assistant” means any individual who, under the personal supervision of a logging  
 47 | supervisor, handles sealed sources or tracers that are not in logging tools or shipping containers  
 48 | or who performs surveys required by 16.22.

49 “Logging supervisor” means an~~the~~ individual who uses sources of radiation or provides personal  
 50 | supervision in the use of sources of radiation at a temporary jobsite~~of the utilization of sources of~~  
 51 | radiation at the well site and who is responsible to the licensee for assuring compliance with the  
 52 | requirements of the Department’s regulations and the conditions of the license.

53 “Logging tool” means a device used subsurface to perform well-logging.

54 “Mineral logging” means any logging performed for the purpose of mineral exploration other than  
 55 | oil or gas.

56 | “Personal supervision” means guidance and instruction by the logging supervisor who is  
 57 | physically present at the jobsite and watching the performance of the operation in such proximity  
 58 | that contact can be maintained and immediate assistance given as required.

59 “Radioactive marker” means radioactive material placed subsurface or on a structure intended for  
 60 | subsurface use for the purpose of depth determination or direction orientation. For purposes of  
 61 | this part, this term includes radioactive collar markers and radioactive iron nails.

62 “Safety review” means a periodic review provided by the licensee for its employees on radiation  
 63 | safety aspects of well-logging, with opportunities for employees to ask safety questions. The  
 64 | review shall include, as appropriate, the results of internal inspections, new procedures or  
 65 | equipment, and accidents or errors that have been observed.

66 “Source holder” means a housing or assembly into which a radioactive source is placed for the  
 67 | purpose of facilitating the handling and use of the source in well-logging operations.

68 “Subsurface tracer study” means the release of a substance tagged with radioactive material for  
 69 | the purpose of tracing the movement or position of the tagged substance in the well-bore or  
 70 | adjacent formation.

71 “Surface casing for protecting fresh water aquifers” means a pipe or tube used as a lining in a  
 72 | well to isolate fresh water aquifers from the well.

73 “Temporary jobsite” means a location where radioactive materials are present for the purpose of  
 74 | performing wireline service operations~~well logging~~ or subsurface tracer studies.

75 “Tritium neutron generator target source” means a tritium source used within a neutron generator  
 76 | tube to produce neutrons for use in well-logging applications.

77 “Uranium sinker bar” means a weight containing depleted uranium used to pull a logging tool  
 78 | down toward the bottom of a well.

**Comment [jsj6]:** “Logging supervisor” definition is updated, consistent with the same definition in 10 CFR 39.2. The proposed language includes the term “sources of radiation” in lieu of “licensed material” since Agreement States regulate both radiation producing machines and radioactive materials.

The added language explicitly expands the responsibilities of the logging supervisor.

The proposed definition differs from SSR CR W (1991) but is more consistent with federal rule.

NRC Compatibility = C

**Comment [jsj7]:** “logging” is added for clarity.

NRC Compatibility = D

**Comment [jsj8]:** Definition is updated, consistent with the same definition in 10 CFR 39.2. The proposed sentence adds clarification.

The proposed definition differs from SSR CR W (1991) but is more consistent with federal rule.

NRC Compatibility = D

**Comment [jsj9]:** Definition added for clarity. The definition is consistent with 10 CFR 39.2.

The phrase is used within Part 16.

There is no equivalent definition in SSR CR W (1991).

NRC Compatibility = D

**Comment [jsj10]:** Definition updated for clarity. The modified definition is consistent with 10 CFR 39.2.

Well logging is a more broad/general term, whereas wireline is more specific to the use of a wire for lowering the source of radiation downhole. Current logging technologies allow for logging while drilling in which the source is part of the drill or logging tool, whereas wireline activities are typically performed after a hole is drilled. Both technologies are in use.

The proposed definition differs from SSR CR W (1991) but is more consistent with federal rule language.

NRC Compatibility = D

"Well-bore" means a drilled hole in which ~~wireline service operations~~ well logging and subsurface tracer studies are performed. As used in this part, "well" includes drilled holes for the purpose of oil, gas, mineral, groundwater, or geological exploration.

"Well-logging" means all operations involving the lowering and raising of measuring devices or tools which may contain sources of radiation or are used to detect radioactive materials into well-bores or cavities for the purpose of obtaining information about the well or adjacent formations which may be used in oil, gas, mineral, groundwater, or geological exploration.

"Wireline" means a cable ~~containing one or more~~ which may or may not contain electrical conductors which is used to lower and raise logging tools in the well-bore.

"Wireline service operation" means any evaluation or mechanical service which is performed in the well-bore using devices on a wireline.

### 16.3 Specific licenses for well logging.

16.3.1 The Department will approve an application for a specific license for the use of radioactive material in well logging if the applicant meets the following requirements:

16.3.1.1 The applicant shall satisfy the general requirements specified in Part 3, Sections 3.9, 3.9.1, 3.9.2, 3.9.4 and 3.14.1 for byproduct, source, and special nuclear material, as appropriate, and any special requirements contained in this part.

16.3.1.2 The applicant shall develop a program for training logging supervisors and logging assistants and submit to the Department a description of this program which specifies the:

(1) Initial training;

(2) On-the-job training;

(3) Annual safety reviews (refresher training) provided by the licensee;

(4) Means the applicant will use to demonstrate the logging supervisor's knowledge and understanding of and ability to comply with the Department's regulations and licensing requirements and the applicant's operating and emergency procedures; and

(5) Means the applicant will use to demonstrate the logging assistant's knowledge and understanding of and ability to comply with the applicant's operating and emergency procedures.

16.3.1.3 The applicant shall submit to the Department written operating and emergency procedures as described in 16.16 that includes the important radiation safety aspects of the procedures.

16.3.1.4 The applicant shall establish and submit to the Department its program for annual inspections of the job performance of each logging supervisor and well logging assistant to ensure that the Department's regulations, license requirements, and the applicant's operating and emergency procedures are followed. Inspection records must be retained for 3 years after each annual internal inspection.

16.3.1.5 The applicant shall submit a description of its overall organizational structure as it applies to the radiation safety responsibilities in well logging, including specified delegations of authority and responsibility.

16.3.1.6 If an applicant wants to perform leak testing of sealed sources, the applicant shall identify the manufacturers and the model numbers of the leak test kits to be used. If the applicant wants to analyze its own wipe samples, the applicant shall establish

**Comment [jsj11]:** The definition "well-bore" is modified to "well", and language is added, consistent with the "well" definition in 10 CFR 39.2. Subsequent use of the phrase "well-bore" in 16.2 definitions is changed to "well" for consistency. The proposed definition/language differs from SSRW (1991) but is more consistent with federal rule.

NRC Compatibility (for "well" definition) = D

**Comment [jsj12]:** The definition "well-logging" is updated, consistent with the same definition in 10 CFR 39.2.

The proposed definition differs from SSRW (1991) but is more consistent with federal rule. NRC Compatibility = C

**Comment [JJ13]:** Section 16.3 numbering was previously omitted from the rule.

Section 16.3 and subsections are added for consistency with 10 CFR 39.13. NRC Compatibility = H&S

**Comment [jsj14]:** Cross-references are expanded for consistency with the expanded cross-references in 10 CFR 39.13. This provision is expanded for consistency with federal rules and differs from SSRW which is not current with federal rule. NRC RATS 2011-2 NRC Compatibility (39.13)= H&S

**Formatted:** Font: Not Bold, Not Highlight

**Comment [jsj15]:** The phrase "refresher training" is added for clarity so it is not confused with the annual audit or inspection of logging supervisors and assistants, which is a separate requirement. Appendix D of NRC NUREG-1556, Vol. 14 similarly clarifies that the safety reviews refer to the annual refresher training.

**Formatted:** Indent: Left: 0", Hanging: 1.5", Tab stops: 1.13", Left + 1.5", Left + 2", Left + Not at 1.56" + 1.75"

**Comment [jsj16]:** The proposed provision differs slightly from that in 10 CFR 39.13. The CFR includes language which allows submission of an outline or summary of the procedures rather than submission of the actual procedures. As a matter of practice, the Radiation Program has and continues to require submission of complete procedures and therefore submission of an outline of procedures is not allowed. NRC Compatibility = H&S

**Comment [jsj17]:** The proposed provision includes the well logging assistant which differs slightly from the language in 10 CFR 39.13.

The CFR explicitly specifies the annual inspection of well logging supervisors. However, NRC guidance – including a model/example checklist – includes the well logging assistant. The proposed addition of the logging assistant clarifies that the annual inspection requirement applies to well logging supervisors and well logging assistants.

NRC Compatibility = H&S

**Formatted:** Indent: Left: 0", Hanging: 1.13", Tab stops: 0.5", Left + 1", Left + 1.13", Left + 1.5", Left + 2", Left

procedures to be followed and submit a description of these procedures to the Department. The description must include the:

- (1) Instruments to be used;
- (2) Methods of performing the analysis; and
- (3) Pertinent experience of the person who will analyze the wipe samples.

## **PROHIBITION**

### **16.4 Prohibition Agreement with well owner or operator.**

16.4.1 No licensee shall perform wireline service operations with a sealed source(s) unless, prior to commencement of the operation, the licensee has a written agreement with the well operator, well owner, drilling contractor, or land owner that: A licensee may perform well logging with a sealed source only after the licensee has a written agreement with the employing well owner or operator. This written agreement must identify who will meet the following requirements:

16.4.1.1 In the event a sealed source is lodged downhole, a reasonable effort at recovery will be made to recover it; and

16.4.1.2 A person may not attempt to recover a sealed source in a manner which, in the licensee's opinion, could result in its rupture.

16.4.1.3 The radiation monitoring required in 16.22.7 will be performed.

16.4.1.4 If the environment, any equipment, or personnel are contaminated with radioactive material, they must be decontaminated before release from the site or release for unrestricted use; and

16.4.21.5 In the event a decision is made to abandon the sealed source downhole, the requirements of 16.25 and of any other State agency having applicable regulations shall be met. If the sealed source is classified as irretrievable after reasonable efforts at recovery have been expended, the requirements of 16.25.4.2(1), 16.25.4.2(2), 16.25.4.2(3) and 16.25.6 must be implemented within 30 days.

16.4.2 The licensee shall retain a copy of the written agreement for 3 years after the completion of the well logging operation.

16.4.3 A licensee may apply, pursuant to Part 1, Section 1.5.1, for Department approval, on a case-by-case basis, of proposed procedures to abandon an irretrievable well logging source in a manner not otherwise authorized in 16.4.1.5.

16.4.4 A written agreement between the licensee and the well owner or operator is not required if the licensee and the well owner or operator is part of the same corporate structure or otherwise similarly affiliated. However, the licensee shall still otherwise meet the requirements in 16.4.1.1 through 16.4.1.5.

## **EQUIPMENT CONTROL**

### **16.5 Limits on Levels of Radiation.**

Sources of radiation shall be used, stored, and transported in such a manner that the transportation requirements of Part 17 and the dose limitation requirements of Part 4 of these regulations are met.

### **16.6 Storage Precautions.**

**Formatted:** Numbered + Level: 1 +  
Numbering Style: 1, 2, 3, ... + Start at: 1 +  
Alignment: Left + Aligned at: 1.13" + Indent  
at: 1.38"

**Formatted:** Numbered + Level: 1 +  
Numbering Style: 1, 2, 3, ... + Start at: 1 +  
Alignment: Left + Aligned at: 1.13" + Indent  
at: 1.38"

**Formatted:** Numbered + Level: 1 +  
Numbering Style: 1, 2, 3, ... + Start at: 1 +  
Alignment: Left + Aligned at: 1.13" + Indent  
at: 1.38"

**Formatted:** Not Highlight

**Comment [jsj18]:** Section title is updated  
consistent with the title in 10 CFR 39.15.

The proposed language differs from SSR CR W  
(1991) but is more consistent with federal rule.

**Formatted:** Indent: Hanging: 0.5"

**Comment [jsj19]:**  
Section 16.4 (and subsections) are modified,  
consistent with 10 CFR 39.15

The proposed language prescribes additional  
requirements beyond those currently specified,  
although they are generally consistent with prudent  
radiation safety practices or other requirements of  
these regulations.

The proposed language differs from SSR CR W  
(1991) but is more consistent with federal rule.

NRC Compatibility (39.15) = C

**Comment [jsj20]:** This provision, consistent  
with 10 CFR 39.15(c), will allow a licensee  
alternatives for abandonment procedures on a case  
by case basis.

The proposed language differs from SSR CR W  
(1991) but is more consistent with federal rule.

NRC Compatibility (39.15) = C

**Comment [jsj21]:** This provision, consistent  
with 10 CFR 39.15(d), provides an exception when  
the logging licensee is under the same corporate  
structure as the well owner.

The proposed language differs from SSR CR W  
(1991) but is more consistent with federal rule.

NRC Compatibility (39.15) = C

170 **16.6.1** ~~Each source of radiation, except an accelerator, shall be provided with a storage or transport~~  
 171 ~~container. The container shall be provided with a lock, or tamper seal for calibration sources, to~~  
 172 ~~prevent unauthorized removal of, or exposure to, the source of radiation. The licensee shall store~~  
 173 ~~each source of radiation, except an accelerator, in a storage container or transportation package.~~

174 **16.6.1.1** ~~The container or package must be locked and physically secured to prevent~~  
 175 ~~tampering or removal of radiation sources from storage by unauthorized~~  
 176 ~~personnel.~~

177 **16.6.21.2** Sources of radiation shall be stored in a manner which will minimize danger from  
 178 explosion or fire.

## 179 **16.7 Transport Precautions.**

180 **16.7.1** ~~The licensee shall lock and Transport containers shall be physically secured to the transport~~  
 181 ~~package containing radioactive material in the transporting vehicle to prevent accidental loss,~~  
 182 ~~tampering, or unauthorized removal of the radioactive material from the vehicle.~~

## 183 **16.8 Radiation Survey Instruments.**

184 **16.8.1** The licensee or registrant shall keep a calibrated and operable radiation survey instrument  
 185 capable of detecting beta and gamma radiation at each field station and temporary jobsite to  
 186 make the radiation surveys required by this part and by Part 4 of these regulations. To satisfy this  
 187 requirement, the radiation survey instrument must be capable of measuring 0.001 mSv (0.1  
 188 mrem) per hour through at least 0.5 mSv (50 mrem) per hour.

189 **16.8.2** ~~The licensee shall have available additional calibrated and operable radiation detection~~  
 190 ~~instruments sensitive enough to detect the low radiation and contamination levels that could be~~  
 191 ~~encountered if a sealed source is ruptured. The licensee may own the instruments or may have a~~  
 192 ~~procedure to obtain them quickly from a second party.~~

193 **16.8.23** Each radiation survey instrument shall be calibrated:

194 **16.8.23.1** At intervals not to exceed 6 months and after each instrument servicing;

195 **16.8.23.2** For linear scale instruments, at two points located approximately 1/3 and 2/3 of  
 196 full-scale on each scale; for logarithmic scale instruments, at midrange of each  
 197 decade, and at two points of at least one decade; and for digital instruments, at  
 198 appropriate points; and

199 **16.8.23.3** So that accuracy within 20 percent of the true radiation level can be  
 200 demonstrated on each scale.

201 **16.8.34** Calibration records shall be maintained for a period of ~~23~~ years ~~after the date of calibration~~ for  
 202 inspection by the Department.

## 203 **16.9 Leak Testing of Sealed Sources.**

204 **16.9.1** Requirements.

205 Each licensee ~~who uses~~ a sealed source ~~of radioactive material~~ shall have the sources  
 206 tested for leakage ~~periodically. Records of leak test results shall be kept in units of becquerel (Bq)~~  
 207 ~~(or microcurie,  $\mu$ Ci) and maintained for inspection by the Department for 6 months after the next~~  
 208 ~~required leak test is performed or until transfer or disposal of the sealed source. The licensee shall~~  
 209 ~~keep a record of leak test results in units of becquerel (Bq) or microcuries ( $\mu$ Ci) and retain the~~  
 210 ~~record for inspection by the Department for 3 years after the leak test is performed.~~

211 **16.9.2** Method of Testing.

**Comment [jsj22]:** Provision amended, consistent with 10 CFR 39.31(b)(1). The proposed language provides more explicit requirements for securing a container in storage.

The phrases "except an accelerator" and "or exposure to" are retained.

The proposed language differs from SSR W (1991) but is more consistent with federal rule.

NRC Compatibility (39.31(b)) = C

**Formatted:** Indent: Left: 0", Hanging: 1.5"

**Formatted:** Indent: Left: 0.5", Hanging: 1"

**Comment [jsj23]:** Provision amended, consistent with 10 CFR 39.31(b)(2). The proposed language provides more explicit requirements for securing a transportation package in the transport vehicle.

The proposed language differs from SSR W (1991) but is more consistent with federal rule.

NRC Compatibility (39.31(b)) = C

**Formatted:** Indent: Hanging: 0.5"

**Comment [jsj24]:** Provision added, consistent with 10 CFR 39.33(b). The proposed language requires additional survey instruments to be available (but not necessarily in a licensee's possession) in the event of a source rupture.

The proposed language differs from SSR W (1991) but is more consistent with federal rule.

NRC Compatibility (39.33(b)) = H&S

**Formatted:** Indent: Left: 0", Hanging: 0.5"

**Formatted:** Indent: Left: 0.5", Hanging: 1"

**Comment [JJ25]:** Here and throughout other sections of the rule, the record retention requirement is changed from 2 years to 3 years, consistent with federal rule in 10 CFR 39.33(d).

The current inspection frequency for well logging licensees is 3 years. Allowing for a 3 year record retention period brings consistency between the records availability and the inspection cycle.

The current record retention cycle in SSR W is 2 years. The proposed language differs from SSR W (1991) but is more consistent with federal rule.

**Comment [JJ26]:** The proposed language is updated for consistency with 10 CFR 39.35(a).

The proposed language will require that licensees retain leak test requirements for a period of 3 years rather than the current 1 year period (~6 months beyond the next required leak test). Licensees regulated under Part 16 are inspected at a frequency of 3 years. The proposed change better aligns the record retention period with the inspection frequency to afford the opportunity to inspect these records over a longer period.

**Comment [jsj27]:** The language is updated for consistency with 10 CFR 39.35.

The term "Licensing state" is no longer being used in the regulatory scheme.

212 16.9.2.1 Tests for leakage shall be performed using a leak test kit or method approved by  
 213 the Department, the ~~U.S. Nuclear Regulatory Commission~~NRC, ~~or~~ an Agreement  
 214 State, ~~or a Licensing State~~.

Formatted: Indent: Left: 0.5", Hanging: 1"

215 16.9.2.2 The wipe test sample shall be taken from the nearest accessible point to the  
 216 surface of the sealed source where contamination is likely to accumulate.

Comment [jsj28]: The phrase "wipe" is added here and in other sections for technical clarity and consistency with 10 CFR 39.35.

217 16.9.2.3 The wipe test sample shall be analyzed for radioactive contamination.

Radioactive sources are most commonly tested for leakage via collection of a wipe test.

218 16.9.2.4 The analysis shall be capable of detecting the presence of 185 Bq (0.005  
 219 microcuries) of radioactive material on the wipe test sample and must be  
 220 performed by a person specifically approved by the Department, the ~~U.S.~~  
 221 ~~Nuclear Regulatory Commission~~NRC, ~~or~~ an Agreement State, ~~or a Licensing~~  
 222 State to perform the analysis.

NRC Compatibility = C

Formatted: Indent: Left: 0.5", Hanging: 1"

### 223 16.9.3 ~~Interval of Testing~~Test Frequency.

Formatted: Indent: Left: 0.5", Hanging: 1"

224 16.9.3.1 Each sealed source of radioactive material (except an energy compensation  
 225 source (ECS)) shall be tested at intervals not to exceed 6 months. In the absence  
 226 of a certificate from a transferor indicating that a test has been made within 6  
 227 months prior to the transfer, the sealed source shall not be used until tested.

228 16.9.3.2 Each ECS that is not exempt from testing in accordance with 16.9.5 must be  
 229 tested at intervals not to exceed 3 years. In the absence of a certificate from a  
 230 transferor indicating that a test has been made within the 3 years prior to the  
 231 transfer, the ECS shall not be used until tested.

### 232 16.9.4 Leaking or Contaminated Sources.

233 If, for any reason, it is suspected that a sealed source may be leaking, it shall be removed from  
 234 service immediately and tested for leakage as soon as practical.

Formatted: Indent: Left: 0.5", Hanging: 1"

235 16.9.4.1 If the wipe test reveals the presence of 185 Bq (0.005 microcuries) or more of  
 236 removable radioactive material, the licensee shall immediately withdraw the  
 237 source from use and shall cause it to be decontaminated and repaired, or  
 238 disposed of, by a licensee authorized by the Department, ~~the NRC~~U.S. Nuclear  
 239 ~~Regulatory Commission~~, ~~or~~ Agreement State, ~~or a Licensing State~~ to perform  
 240 these functions.

241 16.9.4.2 The licensee shall check the equipment associated with the leaking source for  
 242 radioactive contamination and, if contaminated, have it decontaminated or  
 243 disposed of by a licensee authorized by the Department, ~~U.S. Nuclear~~  
 244 ~~Regulatory Commission~~NRC, ~~or~~ Agreement State, ~~or a Licensing State~~ to  
 245 perform these functions.

246 16.9.4.3 The licensee shall submit a report to the Department within 5 days of receiving  
 247 the test results. The report must describe the equipment involved in the leak,  
 248 the test results, any contamination which resulted from the leaking source, and  
 249 the corrective action taken up to the time the report is made shall be filed with the  
 250 Department within 5 days of receiving the test results.

Comment [jsj29]: The language is updated/rephrased for consistency with 10 CFR 39.35(d).

The proposed language differs from SSR CR W (1991) but is more consistent with federal rule.

NRC Compatibility = C

### 251 16.9.5 Exemptions from testing requirements.

Comment [jsj30]: Section title updated for consistency with 10 CFR 39.35(e).

NRC Compatibility = C

252 The following sources are exempted from the periodic leak test requirements of 16.9.1 through  
 253 16.9.4:

254 16.9.5.1 Hydrogen-3 (tritium) sources;

255 16.9.5.2 Sources of radioactive material with a half-life of 30 days or less;



- 256 16.9.5.3 Sealed sources of radioactive material in gaseous form;
- 257 16.9.5.4 Sources of beta- or gamma-emitting radioactive material with an activity of 3.7
- 258 MBq (100 microcuries) or less; and
- 259 16.9.5.5 Sources of alpha- ~~or neutron~~ emitting radioactive material with an activity of 0.37
- 260 MBq (10 microcuries) or less.

Formatted: Indent: Left: 0.5", Hanging: 1"

**Comment [JJ31]:**

Consistent with 10 CFR 39.35(e), the periodic leak test exemption is expanded to low activity neutron sources, based on a prior licensee (stakeholder) inquiry/request.

The proposed language differs from SSRCR W (1991) but is more consistent with federal rule.

261 **16.10 QuarterlyPhysical i inventory.**

262 16.10.1 Each licensee or registrant shall conduct a ~~quarterly~~semi-annual physical inventory to account for

263 all sources of radiation ~~received and possessed under the license.~~

264 16.10.2 Records of inventories shall be maintained for 23 years from the date of the inventory for

265 inspection by the Department and shall include:

266 ~~16.10.2.1~~ The quantities and kinds of sources of radiation;

267 ~~16.10.2.2~~ The location where sources of radiation are assigned;

268 ~~16.10.2.3~~ The date of the inventory; and

269 ~~16.10.2.4~~ The name of the individual conducting the inventory.

270 16.10.3 Physical inventory records may be combined with leak test records.

271 **16.11 Utilization Records of material use.**

272 16.11.1 Each licensee or registrant shall maintain current records for each use of sources of radiation

273 which shall include; ~~which shall be kept available for inspection by the Department for 2 years~~

274 ~~from the date of the recorded event.~~

275 ~~16.11.2 The records shall show the following information for each source of radiation:~~

276 16.11.2.1 ~~The M~~make, model number, and a serial number or a description of each source

277 of radiation used;

278 ~~16.11.1.2~~ In the case of unsealed radioactive material used for subsurface tracer studies

279 and radioactive markers, the radionuclide and quantity of activity used in a

280 particular well and the disposition of any unused tracer materials;

281 16.11.2.23 The identity of the well-logging supervisor who is responsible for the licensed

282 material and the identity of logging assistants present; ~~or field unit to whom~~

283 ~~assigned;~~ and

284 16.11.2.34 ~~The L~~locations and date of use of the sources of radiation~~where used and dates~~

285 ~~of use.~~

286 ~~16.11.3 In the case of tracer materials and radioactive markers, the utilization record shall indicate the~~

287 ~~radionuclide and activity used in a particular well.~~

288 16.11.2 The licensee shall make the records required by 16.11.1 available for inspection by the

289 Department. The licensee shall retain the records for 3 years from the date of the recorded

290 event.

291 **16.12 Design, Pperformance, and Ccertification Ccriteria for Ssealed Ssources Uused in**

292 **Ddownhole Ooperations.**

293 16.12.1 ~~Each sealed source, except energy compensation sources (ECS) and those containing~~

294 ~~radioactive material in gaseous form, used in downhole operations and manufactured after~~

**Comment [jsj33]:** The provisions of 16.11 (and subsections) have been updated for consistency with 10 CFR 39.39.

The proposed language will require some minor additional actions for licensees using unsealed radioactive materials. Specifically, the disposition of unused materials will be required to be documented under the proposed rule language.

The proposed language differs from SSRCR W (1991) but is more consistent with federal rule.

NRC Compatibility = C

**Comment [jsj34]:** Deleted language has been relocated to 16.11.2, consistent with the formatting of 10 CFR 39.39.

Formatted: Indent: Left: 0.5", Hanging: 1"

Formatted: Indent: Left: 0.5", Hanging: 1"

**Comment [jsj35]:** The requirements of this provision have been incorporated into 16.11.1.2 (above).

**Comment [jsj36]:** Language updated as a result of NRC review comments, consistent with 10 CFR 39.41.

NRC Letter 03/18/16.

NRC Compatibility (39.41) = B

~~December 30, 1986, shall be certified by the manufacturer, or other testing organization acceptable to the Department, to meet the following minimum criteria~~A licensee may use a sealed source for use in well logging applications if:

16.12.1.1 ~~The sealed source is~~Be of doubly encapsulated ~~construction;~~

16.12.1.2 ~~The sealed source contains~~Contain radioactive material whose chemical and physical forms are as insoluble and non-dispersible as practical; and

16.12.1.3 ~~Meets~~Satisfies the requirements of 16.12.3.1, 16.12.3.2, or 16.12.3.3, as appropriate.

16.12.2 ~~For sealed sources, except those containing radioactive material in gaseous form, acquired after December 30, 1986, in the absence of a certificate from a transferor certifying that an individual sealed source meets the requirements of 16.12.1, the sealed source shall not be put into use until such determinations and testing have been performed.~~Reserved

16.12.3 Each sealed source, except energy compensation sources (ECS) and those containing radioactive material in gaseous form, used in downhole operations ~~after December 30, 1986,~~ shall be certified by the manufacturer, or other testing organization acceptable to the Department, as meeting the sealed source performance requirements for oil well-logging:

16.12.3.1 For a sealed source manufactured on or before July 14, 1989, a licensee may use the sealed source, for use in well logging applications, if it meets the requirements of United States Of America Standards Institute (USASI) N5.10-1968, "Classification of Sealed Radioactive Sources" (1968), or the requirements in 16.12.3.2 or 16.12.3.3.

16.12.3.2 For a sealed source manufactured after July 14, 1989, a licensee may use the sealed source, for use in well logging applications, if it meets the oil well logging requirements of American National Standards Institute / Health Physics Society (ANSI/HPS) N43.6-1997, "Sealed Radioactive Sources Classification" (November 1997).

16.12.3.3 For a sealed source manufactured after July 14, 1989, a licensee may use the sealed source, for use in well logging applications, if the sealed source's prototype has been tested and found to maintain its integrity after each of the following tests:

- (1) Temperature test. The test source must be held at ~~minus~~ 40°C for 20 minutes, 600°C for 1 hour, and then be subject to a thermal shock test with a temperature drop from 600°C to 20°C within 15 seconds.
- (2) Impact test. A 5-kg steel hammer, 2.5 cm in diameter, must be dropped from a height of 1 m onto the test source.
- (3) Vibration test. The test source must be subject to a vibration from 25 Hz to 500 Hz at 5 g amplitude for 30 minutes.
- (4) Puncture test. A 1-gram hammer and pin, 0.3 cm pin diameter, must be dropped from a height of 1 m onto the test source.
- (5) Pressure test. The test source must be subject to an external pressure of 1.695 x 10<sup>7</sup> pascal [24,600 pounds per square inch absolute].

16.12.4 Certification documents shall be maintained for inspection by the Department for a period of ~~23~~ years after source disposal. If the source is abandoned downhole, the certification documents shall be maintained until the Department authorizes disposition.

Formatted: Indent: Left: 0.5", Hanging: 1"



**16.12.5** ~~Use of an energy compensation source (ECS) is subject to this part, except that if the ECS is contained within a logging tool, or other tool components, and contains quantities of licensed material not exceeding 3.7 MBq (100 microcurie), the ECS is only subject to the requirements: The licensee may use an energy compensation source (ECS) which is contained within a logging tool, or other tool components, only if the ECS contains quantities of licensed material not exceeding 3.7 MBq (100 microcuries).~~

**Comment [jsj37]:** Provision 16.12.5 and subsections are updated consistent with 10 CFR 39.53 as a result of NRC review comments.

The updated language makes it more explicit that only ECS sources of 100 uCi or less are permitted to be used.

Language and cross-references are updated at the request of NRC.

NRC Letter 03/18/16.  
NRC Compatibility = C

**Formatted:** Indent: Left: 0.5", Hanging: 1"

**16.12.5.1** ~~Of 16.9, 16.10 and 16.11 f~~For well logging applications with a surface casing for protecting fresh water aquifers, use of the ECS is only subject to the requirements of 16.9, 16.10, and 16.11, or

**16.12.5.2** ~~Of 16.9, 16.10, 16.11, 16.12 and 16.25 f~~For well logging applications without a surface casing for protecting fresh water aquifers, use of the ECS is only subject to the requirements of 16.4, 16.9, 16.10, 16.11, and 16.25.1 through 16.25.5.

**16.12.6** ~~Use of a tritium neutron generation target source is subject to this part, except the requirements:~~

**Comment [jsj38]:** Section 16.12.6 is replaced by new sections 16.12.6 and 16.12.7 using language consistent with 10 CFR 39.55.

**16.12.6.1** ~~Of 16.12 and 16.25 do not apply for use of a tritium neutron generation target source containing quantities not exceeding 1,110 MBq (30 curie) and in a well with a surface casing for protecting fresh water aquifers; and~~

**16.12.6.2** ~~Of 16.12 do not apply for use of a tritium neutron generation target source containing quantities exceeding 1,110 MBq (30 curie) or in a well without a surface casing for protecting fresh water aquifers.~~

**Comment [jsj39]:** 16.12.6 and 16.12.7 are added, consistent with 10 CFR 39.41(e), and (f), respectively.

These requirements were previously part of 16.12.1, but were separated for formatting consistency with federal rule.

**16.12.6** ~~The requirements in 16.12.1, 16.12.3.1, 16.12.3.2, and 16.12.3.3 do not apply to sealed sources that contain radioactive material in gaseous form.~~

**16.12.7** ~~The requirements in 16.12.1, 16.12.3.1, 16.12.3.2, and 16.12.3.3 do not apply to Energy Compensation Sources (ECS). ECSs must be registered with the Department under Part 3, Section 3.12.14 or with NRC or an Agreement State.~~

**Comment [jsj40]:** Sections 16.12.8, and 16.12.9 replace current 16.12.6 (and subsections). Language is updated consistent with 10 CFR 39.55 to provide additional clarity in the rule.

**16.12.8** ~~Use of a tritium neutron generator target source, containing quantities not exceeding 1,110 GBq (30 curies) and in a well with a surface casing to protect fresh water aquifers, is subject to the requirements of Part 16 except Sections 16.4, 16.12.1 through 16.12.7, and 16.25.1 through 16.25.5.~~

The proposed language also corrects a unit conversion error – 1,100 MBq (megabecquerel) in the current rule should be 1,100 GBq (gigabecquerel).

The reference to Section 16.4 (well owner agreement) and specific sections in 16.12 and 16.25 are added, consistent with the cross-reference in 10 CFR 39.55.

**16.12.9** ~~Use of a tritium neutron generator target source, containing quantities exceeding 1,110 GBq (30 curies) or in a well without a surface casing to protect fresh water aquifers, is subject to the requirements of Part 16 except Section 16.12.1 through 16.12.7.~~

There is no equivalent language/provision in SSRCR W(1991), but the proposed language is more consistent with federal rule.

NRC Compatibility (39.55) = C

## **16.13 Labeling.**

**16.13.1** ~~The licensee may not use a Each source, source holder, or logging tool containing radioactive material unless the smallest component that is transported as a separate piece of equipment with the radioactive material inside shall bears a durable, legible, and clearly visible marking or label, which has, as a minimum, The marking or labeling must contain the standard radiation caution symbol specified in Part 4, Section 4.27, without the conventional color requirements, and the following wording:~~

**Comment [jsj41]:** Language is updated to be consistent with 10 CFR 39.31(a)(1). The amended language specifies a more explicit prohibition on use of certain items without proper labeling.

The proposed language differs from SSRCR W (1991) but is more consistent with federal rule.

NRC Compatibility (39.31(a))= D

DANGER\* – RADIOACTIVE MATERIAL

\*or "CAUTION"

**Comment [jsj42]:** This provision is incorporated into the prior paragraph.

~~This labeling shall be on the smallest component transported as a separate piece of equipment.~~

**Comment [jsj43]:** Language is updated to be consistent with 10 CFR 39.31(a)(2). The amended language specifies a more explicit prohibition on use of containers without proper labeling.

**16.13.2** ~~The licensee may not use a container to store radioactive material Each transport unless the container shall have permanently has securely attached to it a durable, legible, and clearly visible label. The label must contain which has, as a minimum, the standard radiation caution symbol specified in Part 4, Section 4.27 and the following wording:~~

The proposed language differs from SSRCR W (1991) but is more consistent with federal rule.

NRC Compatibility (39.31(a)) = D

DANGER\*- RADIOACTIVE MATERIAL

NOTIFY CIVIL AUTHORITIES [OR NAME OF COMPANY]

\*or "CAUTION"

16.3.3 The licensee may not transport radioactive material unless the material is packaged, labeled, marked, and accompanied with appropriate shipping papers in accordance with the requirements of Part 17.

16.13.34 The licensee may use a uranium sinker bar in well logging applications only if it is legibly impressed with the following wording:

CAUTION--RADIOACTIVE--DEPLETED URANIUM

and

NOTIFY CIVIL AUTHORITIES [OR COMPANY NAME] IF FOUND

**Comment [jsj44]:** Language is updated to be consistent with 10 CFR 39.31(a)(3). The amended language specifies a more explicit prohibition on use of containers without proper labeling. This requirement is consistent with U.S. Department of Transportation (DOT) requirements contained/referenced in Part 17 of the Colorado radiation regulations.

The proposed language differs from SSR CR W (1991) but is more consistent with federal rule.

NRC Compatibility (39.31(a))= D

#### 16.14 Inspection and Maintenance.

16.14.1 Each licensee shall visually check source holders, logging tools, and source handling tools, for defects before each use to ensure that the equipment is in good working condition and that required labeling is present.

16.14.1.1 If defects are found, the equipment must be removed from service until repaired, and a record must be made listing: the date of check, name of inspector, equipment involved, defects found, and repairs made. These records must be retained for 3 years after the defect is found.

16.14.2 Each licensee or registrant shall conduct, at intervals not to exceed 6 months, a program of inspection and maintenance of source holders, logging tools, source handling tools, storage containers, transport containers, and injection tools to assure proper labeling and physical condition. Each licensee shall have a program for semiannual visual inspection and routine maintenance of source holders, logging tools, injection tools, source handling tools, storage containers, transport containers, and uranium sinker bars to ensure that the required labeling is legible and that no physical damage is visible.

16.14.2.1 If any inspection conducted pursuant to 16.14.1 reveals damage to labeling or components critical to radiation safety, the device shall be removed from service until repairs have been made. If defects are found, the equipment must be removed from service until repaired, and a record must be made listing: date, equipment involved, inspection and maintenance operations performed, any defects found, and any actions taken to correct the defects. These records must be retained for 3 years after the defect is found.

16.14.3 Removal of a sealed source from a source holder or logging tool, and maintenance on sealed sources or holders in which sealed sources are contained may not be performed by the licensee unless a written procedure developed pursuant to 16.16 has been approved either by the Department, NRC, or an Agreement State to perform this operation.

16.14.34 If a sealed source is stuck in the source holder, the licensee shall not perform any operation, such as drilling, cutting, or chiseling, on the source holder unless the licensee is specifically approved by the U.S. Nuclear Regulatory Commission, NRC, or an Agreement State, or a Licensing State to perform this operation.

**Comment [jsj45]:** Language in 16.14 updated for consistency with 10 CFR 39.43.

The added provision in 16.14.1 requires a pre-use inspection and is in addition to the semi-annual inspection required by 16.14.2.

The proposed language of 16.14.1, and .2 is not found in SSR CR W (1991) but is more consistent with federal rule.

NRC Compatibility = C

**Formatted:** Indent: Left: 0", Hanging: 1.5"

**Comment [jsj46]:** Language is modified, consistent with 10 CFR 39.43(b). The added language includes "uranium sinker bars" which is not in the current Part 16.

The proposed language differs from SSR CR W (1991) but is more consistent with federal rule.

NRC Compatibility = C

**Formatted:** Not Highlight

**Formatted:** Indent: Left: 0", Hanging: 1.5"

**Comment [jsj47]:** Language is added, consistent with 10 CFR 39.43(c).

The proposed language specifies that a licensee must have an approved procedure for removing a sealed source from a source holder.

There is no equivalent provision in SSR CR W.

The proposed language differs from SSR CR W (1991) but is more consistent with federal rule.

NRC Compatibility = C

16.14.45 The repair, opening, or modification of any sealed source shall be performed only by persons specifically authorized to do so by the Department, the U.S. Nuclear Regulatory Commission, NRC, or an Agreement State, or a Licensing State.

16.14.5 Records of inspection and maintenance shall be maintained for a period of 23 years for inspection by the Department.

**Comment [jsj48]:** Provision is deleted as record retention requirements are specified in 16.14.1.1 and 16.14.2.1.

NRC Compatibility (10 CFR 39.43) = C

## REQUIREMENTS FOR PERSONNEL SAFETY

### 16.15 Training Requirements.

16.15.1 ~~The~~ licensee or registrant shall ~~may not~~ permit any individual to act as a logging supervisor as defined in this part until such individual ~~has~~:

16.15.1.1 ~~Received~~ Has completed, in a course recognized by the Department, the U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State, instruction training in the subjects outlined in Appendix 16A and demonstrated an understanding thereof;

**Comment [jsj49]:** Language is modified consistent with 10 CFR 39.61(a)

The proposed language provides more prescriptive and/or clarifies training requirements for logging supervisors.

The proposed language differs from SSR W (1991) but is more consistent with federal rule.

NRC Compatibility = B

**Formatted:** Indent: Left: 0.5", Hanging: 1"

16.15.1.2 ~~Read and~~ Has received copies of and instruction in:

(1) ~~The~~ regulations contained in ~~this part and~~ the applicable sections of Parts 1, 4, and 10 and 16 of these regulations or their equivalent;

(2) ~~conditions of appropriate~~ The license or certificate of registration under which the logging supervisor will perform well logging; and

(3) ~~The~~ licensee's or registrant's operating and emergency procedures required by 16.16, and demonstrated an understanding thereof; and

16.15.1.3 ~~Has completed on-the-job training and~~ Demonstrated competence to use in the use of sources of radiation, ~~related remote~~ handling tools, and radiation survey instruments by a field evaluation which will be used on the job; and

**Formatted:** Indent: Left: 0.5", Hanging: 1"

16.15.1.4 ~~Has demonstrated understanding of the requirements in 16.15.1.1, and 16.15.1.2 by successfully completing a written test.~~

16.15.2 ~~No licensee or registrant shall~~ The licensee may not permit any individual to act as a logging assistant assist in the handling of sources of radiation until such individual that person has:

**Comment [jsj50]:** Language is modified consistent with 10 CFR 39.61(b).

The proposed language provides more prescriptive and/or clarifies training requirements for logging assistants.

The proposed language differs from SSR W (1991) but is more consistent with federal rule.

NRC Compatibility (39.61)=B

**Formatted:** Indent: Left: 0.5", Hanging: 1"

16.15.2.1 ~~Has received instruction in the applicable sections of Parts 1, 4, and 10 of these regulations or their equivalent;~~

16.15.2.2 ~~Has Read or~~ received copies of, and instruction in, the licensee's or registrant's operating and emergency procedures required by 16.16 and demonstrated an understanding thereof; and

16.15.2.3 ~~Has demonstrated understanding of the materials listed in 16.15.2.1, and 16.15.2.2 by successfully completing a written or oral test; and~~

16.15.2.4 ~~Has received instruction in the use~~ Demonstrated competence to use, under the personal supervision of the logging supervisor, the sources of radiation, ~~related remote~~ handling tools, and radiation survey instruments, as appropriate for the logging assistant's intended job responsibilities which will be used on the job.

**Comment [jsj51]:** The phrase "refresher training" is added here and elsewhere for clarity so it is not confused with the annual audit or inspection of logging supervisors and assistants, which is a separate requirement.

The proposed phrase "refresher training" does not appear in the federal rule or in SSR Part W.

Appendix D of NRC NUREG-1556, Vol. 14 similarly clarifies that the safety reviews refer to the annual refresher training.

16.15.3 The licensee shall provide safety reviews (refresher training) for logging supervisors and logging assistants at least once during each calendar year.

469 16.15.4 ~~The licensee or registrant shall maintain employee training records for inspection by the~~  
 470 ~~Department for 2 years following termination of the individual's employment. The licensee shall~~  
 471 ~~maintain a record on each logging supervisor's and logging assistant's training and annual safety~~  
 472 ~~review (refresher training).~~

473 16.15.4.1 The training records must include copies of written tests and dates of oral tests  
 474 given after July 14, 1987.

475 16.15.4.2 The training records must be retained until 3 years following the termination of  
 476 employment.

477 16.15.4.3 Records of annual safety reviews (refresher training) must list the topics  
 478 discussed and be retained for 3 years.

#### 479 16.16 Operating and Emergency Procedures.

480 ~~The~~Each licensee's or registrant's shall develop and follow written operating and emergency  
 481 procedures ~~shall include instructions in at least the following that cover:~~

482 16.16.1 Handling and use of sources of radiation to be employed so that no individual is likely to be  
 483 exposed to radiation doses in excess of the standards established in Part 4 of these regulations;

484 16.16.2 Methods and occasions for conducting radiation surveys, ~~including surveys for detecting~~  
 485 ~~contamination, as required by 16.22.3 - 16.22.5;~~

486 16.16.3 Methods and occasions for locking and securing sources of radiation;

487 16.16.4 Personnel monitoring and the use of personnel monitoring equipment;

488 16.16.5 Transportation to temporary jobsites and field stations, including the packaging and placing of  
 489 sources of radiation in vehicles, placarding of vehicles, and securing sources of radiation during  
 490 transportation ~~to prevent accidental loss, tampering, or unauthorized removal;~~

491 16.16.6 Minimizing personnel exposure ~~including exposures from inhalation and ingestion of licensed~~  
 492 ~~tracer material~~of individuals in the event of an accident;

493 16.16.7 Procedure for notifying proper personnel in the event of an accident;

494 16.16.8 Maintenance of records;

495 16.16.9 Use, inspection and maintenance of source holders, logging tools, source handling tools, storage  
 496 containers, transport containers, and injection tools;

497 16.16.10 Procedure to be followed in the event a sealed source is lodged downhole;

498 16.16.11 Procedures to be used for picking up, receiving, and opening packages containing  
 499 radioactive material;

500 16.16.12 For the use of tracers, decontamination of the environment, equipment, and personnel;

501 16.16.13 Maintenance of records generated by logging personnel at temporary jobsites; ~~and~~

502 16.16.14 Notifying proper persons in the event of an accident; ~~and~~

503 ~~16.16.15~~ Actions to be taken if a sealed source is ruptured, including actions to prevent the spread  
 504 of contamination and minimize inhalation and ingestion of radioactive material and actions to  
 505 obtain suitable radiation survey instruments as required by 16.8.

#### 506 16.17 Personnel Monitoring.

**Comment [jsj52]:** Language is modified and added consistent with 39.61(d).

Similar to 16.5.3, the phrase "refresher training" is added for clarity so it is not confused with the annual audit or inspection of logging supervisors and assistants, which is a separate requirement.

The proposed phrase "refresher training" does not appear in the federal rule or in SSR Part W.

NRC Compatibility (39.61) = B

**Formatted:** Indent: Left: 0.5", Hanging: 1"

**Comment [jsj53]:** Language is modified for consistency with 10 CFR 39.63.

The current rule section (without proposed changes) associates the requirements in this section to training requirements. The proposed wording instead realigns the requirements for operating and emergency procedures to the license application process (found in new section 16.3) requirements, similar to the approach used in 10 CFR 39.63. The training requirements (of 16.15) also refer to this section explicitly.

NRC Compatibility = C

**Comment [jsj54]:** Provision 16.16.2 is updated consistent with 10 CFR 39.63(c) at the request of NRC.

NRC Letter 03/18/16.  
NRC Compatibility = C

**Comment [jsj55]:** Provision 16.16.5 is updated consistent with 10 CFR 39.63(g) at the request of NRC

NRC Letter 03/18/16.  
NRC Compatibility = C

**Comment [jsj56]:** Provision 16.16.6 is updated consistent with 10 CFR 39.63(d) at the request of NRC.

NRC Letter 03/18/16.  
NRC Compatibility = C

**Comment [jsj57]:** This provision is deleted as it duplicates the requirement of 16.16.7 earlier in the section.

507 16.17.1 No licensee or registrant shall permit any individual to act as a logging supervisor or to assist in  
 508 the handling of sources of radiation unless each such individual wears, at all times during the  
 509 handling of such sources, a personnel dosimeter that is processed and evaluated by an  
 510 accredited National Voluntary Laboratory Accreditation Program (NVLAP) processor.

511 16.17.1.1 Each personnel dosimeter shall be assigned to and worn by only one individual.

512 16.17.1.2 Film badges must be replaced at least monthly. Other types of personnel  
 513 dosimeter must be replaced at least quarterly.

514 16.17.1.3 After replacement, each personnel dosimeter must be promptly processed.

515 16.17.2 The licensee shall provide bioassay services to individuals using licensed materials in subsurface  
 516 tracer studies if required by the license.

517 16.17.32 Personnel monitoring records shall be maintained for inspection until the Department authorizes  
 518 disposition.

## 519 PRECAUTIONARY PROCEDURES IN LOGGING AND SUBSURFACE TRACER OPERATIONS

### 520 16.18 Security.

521 16.18.1 A logging supervisor must be physically present at a temporary jobsite whenever licensed  
 522 materials are being handled or are not stored and locked in a vehicle or storage place. The  
 523 logging supervisor may leave the jobsite in order to obtain assistance if a source becomes lodged  
 524 in a well.

525 16.18.2 During each logging or tracer application, except when the radiation sources are below ground or  
 526 in shipping or storage containers, the logging supervisor or other individual designated  
 527 employee by the logging supervisor shall maintain direct surveillance of the operation to  
 528 prevent protect against unauthorized or unnecessary entry into a restricted area, as defined in  
 529 Part 1 of these regulations.

### 530 16.19 Handling Tools.

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

### 533 16.20 Subsurface Tracer Studies and radioactive markers.

534 16.20.1 The licensee shall require all personnel handling radioactive tracer material to use Pprotective  
 535 gloves, and if required by the licensee, and other appropriate protective clothing and equipment  
 536 shall be used by all personnel handling radioactive tracer material. Precautions shall be taken to  
 537 avoid ingestion or inhalation of radioactive material and to avoid contamination of field stations  
 538 and temporary jobsites.

539 16.20.2 No licensee shall cause the injection of A licensee may not knowingly inject radioactive material  
 540 into potable fresh water aquifers without prior written authorization from unless specifically  
 541 authorized to do so by the Department and any other appropriate State agency.

542 16.20.3 The licensee may use radioactive markers in wells only if the individual markers contain  
 543 quantities of licensed material not exceeding the quantities specified in Part 3, Schedule 3B. The  
 544 use of markers is subject only to the requirements of 16.10.

### 545 16.21 Particle Accelerators.

546 No licensee or registrant shall permit aboveground testing of particle accelerators, designed for  
 547 use in well-logging, which results in the production of radiation, except in areas or facilities  
 548 controlled or shielded so that the requirements of Part 4, Sections 4.6 and 4.14 of these  
 549 regulations, as applicable, are met.

Formatted: Indent: Left: 0.5", Hanging: 1"

**Comment [jsj58]:** This provision added consistent with 10 CFR Part 39.65(b).

The added language will defer to specific license requirements regarding the need for bioassay when handling unsealed materials.

General bioassay/dose monitoring requirements are also currently specified in Part 4 of the regulations, which is used in conjunction with Part 16.

NRC Compatibility = D

**Comment [jsj59]:** This provision added consistent with 10 CFR Part 39.71(a)

The proposed provision requires the physical presence of the logging supervisor at temporary jobsites.

NRC Compatibility = C

Formatted: Indent: Hanging: 0.5", Tab stops: Not at 1"

Formatted: Indent: Hanging: 0.5"

**Comment [jsj60]:** 16.20.1, and 16.20.2 are modified, consistent with 10 CFR Part 39.45.

To avoid creation of a new subsection and significant rule renumbering, the section title is expanded to include "radioactive markers", which is addressed in 16.20.3 (below).

The modified language in 16.20.1 requires that protective equipment shall be worn as specified by the licensee.

The language of 16.20.2 potentially expands the types of wells that would be covered by this provision by changing the word "potable" to "fresh" water aquifer. Fresh water aquifers may be used for both drinking and non-drinking purposes.

The proposed language differs from SSR W (1991) but is more consistent with federal rule.

NRC Compatibility = C

**Comment [jsj61]:** Section 16.20.3 is added consistent with 10 CFR 39.47.

The proposed language limits the types of markers that can be used in wells to those which fall within the exempt quantities specified under schedule 3B of Part 3.

There is no equivalent provision in SSR W (1991) but is more consistent with federal rule.

NRC Compatibility = D



## RADIATION SURVEYS CONTAMINATION CONTROL AND SURVEY RECORDS

### 16.22 Radiation Surveys.

16.22.1 Radiation surveys or calculations shall be made and recorded for each area where radioactive materials are stored. The licensee shall make radiation surveys, including but not limited to the surveys required by 16.22.2 through 16.22.5, of each area where licensed materials are used and stored.

16.22.2 Radiation surveys or calculations shall be made and recorded for the radiation levels in occupied positions and on the exterior of each vehicle used to transport radioactive material. Such surveys and calculations shall include each source of radiation or combination of sources to be transported in the vehicle. Before transporting licensed materials, the licensee shall make a radiation survey of the position occupied by each individual in the vehicle and of the exterior of each vehicle used to transport the licensed materials.

16.22.3 If the sealed source assembly is removed from the logging tool before departing the jobsite, the logging tool detector shall be energized, or a survey meter used, to assure that the logging tool is free of contamination. If the sealed source assembly is removed from the logging tool before departure from the temporary jobsite, the licensee shall confirm that the logging tool is free of contamination by energizing the logging tool detector or by using a survey meter.

16.22.4 If the licensee has reason to believe that, as a result of any operation involving a sealed source, the encapsulation of the sealed source could be damaged by the operation, the licensee shall conduct a radiation survey, including a contamination survey, during and after the operation.

16.22.4.5 Radiation surveys shall be made and recorded at the jobsite or wellhead for each tracer operation, except those using hydrogen-3, carbon-14, and sulfur-35. These surveys shall include measurements of radiation levels before and after the operation. The licensee shall make a radiation survey at the temporary jobsite before and after each subsurface tracer study to confirm the absence of contamination.

16.22.5 Records required pursuant to 16.22.1 through 16.22.4 shall include the dates, the identification of individual(s) making the survey, the identification of survey instrument(s) used, and an exact description of the location of the survey. Records of these surveys shall be maintained for inspection by the Department for 2 years after completion of the survey. The results of surveys required pursuant to 16.22.1 through 16.22.5 must be recorded and must include:

16.22.6.1 The date(s) of the survey;

16.22.6.2 The name of the individual(s) making the survey;

16.22.6.3 The identification of the survey;

16.22.6.4 Instrument(s) used; and

16.22.6.5 The location of the survey.

The licensee shall retain records of the surveys for inspection by the Department for 3 years after they are made.

### Contamination control.

16.22.7 If the licensee detects evidence that a sealed source has ruptured or radioactive materials have caused contamination, the licensee shall initiate immediately the emergency procedures required by 16.16.

16.22.8 If contamination results from the use of radioactive material in well logging, the licensee shall decontaminate all personnel, work areas, equipment, and unrestricted areas.

**Comment [JJ62]:** Language is updated consistent with 10 CFR 39.67(a). The proposed language clarifies that surveys must be performed in areas where radioactive materials are used and not limited to storage areas only. (SSRCR W includes "storage" but was omitted from the Part 16 rule). The proposed language differs from SSRCR W (1991) but is more consistent with federal rule. NRC Compatibility = C

**Comment [JJ63]:** Language is updated consistent with 10 CFR 39.67(b). The proposed language eliminates the option for a licensee to perform calculations in lieu of surveys. The proposed language also eliminates the requirement to survey each combination of sources. As proposed, the survey performed is expected to reflect the current configuration and quantity of sources being transported at that time. The proposed language differs from SSRCR W (1991) but is more consistent with federal rule. NRC Compatibility = C

**Formatted:** Not Highlight

**Formatted:** Not Highlight

**Comment [JJ64]:** Language is updated consistent with 10 CFR 39.67(c). The proposed wording utilizes clearer language. The proposed language differs from SSRCR W (1991) but is more consistent with federal rule. NRC Compatibility = C

**Comment [JJ65]:** New language is incorporated consistent with 10 CFR 39.67(d). The proposed new language provides a precautionary requirement to perform surveys in the event that damage to the source is suspected. This provision does not appear in SSRCR W. The proposed language differs from SSRCR W (1991) but is more consistent with federal rule. NRC Compatibility = C

**Comment [JJ66]:** Language is updated consistent with 10 CFR 39.67(e). The proposed language simplifies the requirement for surveys. The temporary jobsite includes all areas where the sources will be or have been used. The proposed language does not provide an exemption for certain isotopes. The proposed language differs from SSRCR W (1991) but is more consistent with federal rule. NRC Compatibility = C

**Comment [Jsj67]:** Language of 16.22.6 is updated consistent with 10 CFR 39.67(f). Plural language is incorporated for clarity as more than one individual, instrument or dates of surveys may occur.

The proposed language/requirements are effectively the same as the current language.

**Comment [Jsj68]:** Language is added, consistent with 10 CFR 39.69.

The added requirements in 16.22.7 – 16.22.9 provide additional requirements specific to contamination control for subsurface tracer studies not found in the current rule.

These provisions do not appear in SSRCR W.

The proposed language differs from SSRCR W (1991) but is more consistent with federal rule.

**Comment [Jsj69]:** The requirement for decontamination of "personnel" is added, consistent with the requirement in 16.4.1.4.



16.22.9 During efforts to recover a sealed source lodged in the well, the licensee shall continuously monitor, with an appropriate radiation detection instrument or a logging tool with a radiation detector, the circulating fluids from the well, if any, to check for contamination resulting from damage to the sealed source.

#### 16.23 Documents and Records Required at Field Stations.

Each licensee or registrant shall maintain the following documents and records, for inspection by the Department, the following documents and records for the specific devices and sources used at the field station:

16.23.1 AppropriateThe license, certificate of registration, or equivalent document(s) authorizing the use of sources of radiation;

16.23.2 Operating and emergency procedures required by 16.16;

16.23.3 ApplicableA copy of Parts 1, 4, 10, and 16 and other applicable regulations;

16.23.4 Records of the latest survey instrument calibrations pursuant to required by 16.8;

16.23.5 Records of the latest leak test results pursuant to required by 16.9;

16.23.6 Records of quarterly-physical inventories required by pursuant to 16.10;

16.23.7 Utilization records required by pursuant to 16.11;

16.23.8 Records of inspection and maintenance required by pursuant to 16.14;

16.23.9 Survey records required by pursuant to 16.22; and

16.23.10 ———. Training records required by pursuant to 16.15.4.

#### 16.24 Documents and Records Required at Temporary Jobsites.

Each licensee or registrant conducting operations at a temporary jobsite shall havemaintain the following documents and records available at that at the temporary jobsite for inspection by the Department until the well logging operation is complete:

16.24.1 Operating and emergency procedures required by 16.16;

16.24.2 Survey records required pursuant to 16.22 for the period of operation at the site;

16.24.3 Evidence of current calibration for the radiation survey instruments in use at the site required by 16.8;

16.24.4 When operating in the State under reciprocity, a copy of the appropriate license, certificate of registration, or equivalent document(s) authorizing use of sources of radiation; and

16.24.5 Shipping papers for the transportation of radioactive material required by Part 17.

#### NOTIFICATION

#### 16.25 Notification of Incidents, Abandonment, and Lost Sources.

16.25.1 Notification of incidents and sources lost in other than downhole logging operations shall be made in accordance with appropriate provisions of 4.52 of these regulations. The licensee shall notify the Department of the theft or loss of radioactive materials, radiation overexposures, excessive

**Comment [jsj70]:** Language is modified/added, consistent with 10 CFR 39.73.

Part 1 is included as there is reliance on this part for certain words used in Part 16, but not included in the definitions of Part 16.

The proposed language differs from SSR CR W (1991) but is more consistent with federal rule.

NRC Compatibility (39.73) = C

**Comment [jsj71]:** The introductory language of 16.23 is updated consistent with 10 CFR 39.73 at the request of NRC.

NRC Letter 03/18/16.  
NRC Compatibility = C

**Comment [jsj72]:** Language is added, consistent with 10 CFR 39.75.

The proposed language differs from SSR CR W (1991) but is more consistent with federal rule.

NRC Compatibility (39.75) = C

**Formatted:** Indent: Left: 0"

**Comment [JJ73]:** Provision modified, consistent with 10 CFR 39.77(b).

The provision adds specificity and clarity regarding notification of the department in the event of loss or theft of radioactive materials and under other circumstances.

The more specific/modified provision does not appear in SSR CR W.

The proposed language differs from SSR CR W (1991) but is more consistent with federal rule.

NRC Compatibility = D

**Formatted:** Not Highlight

632 ~~levels and concentrations of radiation, and certain other accidents as required by Part 4, Sections~~  
 633 ~~4.51, 4.52, and 4.53.~~

634 16.25.2 Whenever a sealed source or device containing radioactive material is lodged downhole, the  
 635 licensee shall: ~~16.25.2.1 M~~ monitor at the surface for the presence of radioactive contamination  
 636 with a radiation survey instrument or logging tool during logging tool recovery operations; ~~and~~

637 ~~16.25.32.2~~ Notify the Department immediately by telephone and subsequently within 30 days by  
 638 confirmatory letter if the licensee knows or has reason to believe that a sealed source has been  
 639 ruptured. This letter shall identify the well or other location, describe the magnitude and extent of  
 640 the escape of radioactive material, assess the consequences of the rupture, and explain efforts  
 641 being planned or taken to mitigate these consequences.

642 ~~16.25.43~~ If a sealed source becomes lodged in a well, and ~~W~~when it becomes apparent that efforts  
 643 to recover the radioactive source will not be successful, the licensee shall:

644 ~~16.25.4.1~~ Notify the Department by telephone of the circumstances that resulted in the  
 645 inability to retrieve the source; and

646 (1) Obtain Department approval to implement abandonment procedures; or

647 (2) That the licensee implemented abandonment before receiving Department  
 648 approval because the licensee believed there was an immediate threat to public  
 649 health and safety; and

650 ~~16.25.34.24~~ Advise the well owner or operator, as appropriate, of the abandonment  
 651 procedures under 16.4.1 or 16.4.3; regulations of the Department regarding  
 652 abandonment and an appropriate method of abandonment, which shall include:

653 (1) The immobilization and sealing in place of the radioactive source with a cement  
 654 plug;

655 (2) The setting of a whipstock or other deflection device; and

656 (3) The mounting of a permanent identification plaque at the surface of the well,  
 657 containing the appropriate information required by 16.25.64; and

658 ~~16.25.4.3~~ Either ensure that abandonment procedures are implemented within 30 days  
 659 after the sealed source has been classified as irretrievable or request an  
 660 extension of time if unable to complete the abandonment procedures.

661 ~~16.25.53.3~~ The licensee shall, ~~File a written report with the Department~~ within 30 days after a sealed  
 662 source has been classified as irretrievable, make a report in writing to the Department of the  
 663 abandonment. The licensee shall send a copy of the report to ~~the~~each appropriate State or  
 664 Federal agency that issued permits or otherwise approved of the drilling operation. The report  
 665 shall contain the following information:

666 ~~16.25.5.1(4)~~ Date of occurrence;

667 ~~16.25.5.2(2)~~ A description of the well-logging source involved, including the radionuclide and  
 668 its quantity, chemical, and physical form;

669 ~~16.25.5.3(3)~~ Surface location and identification of the well;

670 ~~16.25.5.4(4)~~ Results of efforts to immobilize and seal the source in place;

671 ~~16.25.5.5(5)~~ A brief description of the attempted recovery effort;

672 ~~16.25.5.6(6)~~ Depth of the source;

Formatted: Not Highlight

Formatted: par1

Comment [jsj74]: Current language is consistent with 10 CFR 39.77(a) but was reformatted to a higher level/stand-alone subsection for consistency with NRC rules.

The current rule structure required that the source be lodged "downhole" before the provision would be applicable since 16.25.2 would need to be true before 16.25.2.2 would apply. The revised formatting (e.g., making section 16.25.2.2 into 16.25.3 a "higher level" subsection) mandates that the provision apply regardless of whether a source rupture occurs downhole (or elsewhere) and eliminates a potential conflict with federal rule.

NRC Compatibility = C  
 NRC Letter dated 03/18/16.

Formatted: Not Highlight

Comment [jsj75]: Language is added, consistent with 10 CFR 39.77(c)

NRC Compatibility = C

Formatted: Not Highlight

Formatted: Not Highlight

Formatted: Not Highlight

Formatted: Indent: Left: 0.5", Hanging: 1"

Formatted: Not Highlight

Formatted: Not Highlight

Formatted: Indent: Left: 0.5", Hanging: 1"

Comment [jsj76]: Language is added, consistent with 10 CFR 39.77(c)(2).

NRC Compatibility = C

Formatted: Not Highlight

Formatted: Not Highlight

Comment [jsj77]: The language of subsections (1), (2), and (3) of 16.25.4.2 are retained from the current rule (and SSRCR W- 1991), although they do not appear in 10 CFR 39.77 as shown here. Provisions similar to (1), (2), and (3) appear in 10 CFR 39.15(5) [found in 16.4.1.5]. Section 16.4.1.5 contains cross-references to this section (16.25.4.2).

Comment [JJ78]: Language is added, consistent with 10 CFR 39.77(c)(3).

Formatted: Indent: Left: 0.5", Hanging: 1"

Comment [jsj79]: Language is modified/added, consistent with 10 CFR 39.77(d)

Formatted: Indent: Left: 0"

Formatted: Not Highlight

Formatted: Not Highlight

Formatted: Not Highlight

Formatted: Not Highlight

Formatted: Not Highlight

Formatted: Not Highlight

Formatted: Not Highlight

Formatted: Not Highlight

673	<u>16.25.5.7(7)</u>	Depth of the top of the cement plug;	Formatted: Not Highlight
674	<u>16.25.5.8(8)</u>	Depth of the well;	Formatted: Not Highlight
675	<u>16.25.5.9(9)</u>	The immediate threat to public health and safety justification for implementing	Formatted: Not Highlight
676		abandonment if prior Department approval was not obtained in accordance with	
677		<u>16.25.4.1(2)</u> <del>16.25.3.2(1)</del> ;	
678	<u>16.25.5.10(10)</u>	Any other information, such as a warning statement, contained on the permanent	Formatted: Not Highlight
679		identification plaque; and	Formatted: Not Highlight
680	<u>16.25.5.11(11)</u>	<del>The names of State and Federal</del> Agencies receiving a copy of this report.	Formatted: Not Highlight
681	16.25.46	Whenever a sealed source containing radioactive material is abandoned downhole, the	Formatted: Indent: Left: 0", Hanging: 1"
682		licensee shall provide a means to prevent inadvertent intrusion on the source, unless the	
683		source is not accessible to any subsequent drilling operations, and shall provide a	
684		permanent plaque <sup>1</sup> for posting the well or well-bore. This plaque shall:	
685	1 An example of a suggested plaque is shown in Appendix 16B.		
686	16.25.46.1	Be constructed of long-lasting material, such as stainless steel, brass, bronze, or	Formatted: Indent: Left: 0.5", Hanging: 1"
687		monel;	
688	16.25.46.2	Be mounted at the surface of the well, unless the mounting of the plaque is not	
689		practical;	
690	16.25.46.3	Be at least 17 cm (7 inches) square and 3 mm (1/8 <sup>th</sup> inch) thick; and	
691	<u>16.25.46.4</u>	Contain the following information engraved on its face:	Comment [jsj80]: The language of subsections within 16.25.6.4 is updated for consistency with 10 CFR 39.15
692	(1)	The word "CAUTION";	
693	(2)	The radiation symbol ( <del>the color requirement prescribed in Part 4, Section 4.27</del>	
694		<del>need not be met</del> ) <del>without the conventional color requirement</del> ;	
695	(3)	The date <del>the source was abandoned</del> <del>of abandonment</del> ;	
696	(4)	The name of the well-operator or well-owner, <del>as appropriate</del> ;	
697	(5)	The well name and well identification number(s) or other designation;	
698	(6)	<del>An identification of the</del> The sealed source(s) by radionuclide and <del>quantity</del> activity;	
699	(7)	The <del>source</del> -depth <del>of the source</del> and the depth to the top of the plug; and	
700	(8)	An appropriate warning, depending on the specific circumstances of each	
701		abandonment. <sup>2</sup>	
702	2 Appropriate warnings may include: (a) "Do not drill below plug-back depth"; (b) "Do not enlarge casing"; or (c) "Do not re-enter the		
703	hole", followed by the words, "before contacting the Colorado Department of Public Health and Environment, Hazardous Materials		
704	And Waste Management Division."		
705	16.25.57	The licensee shall immediately notify the Department by telephone and subsequently by	Formatted: Indent: Left: 0", Hanging: 1"
706		confirming letter if the licensee knows or has reason to believe that radioactive material	
707		has been lost in or to an underground potable aquifer. Such notice shall designate the	
708		well location and shall describe the magnitude and extent of loss of radioactive material,	
709		assess the consequences of such loss, and explain efforts planned or being taken to	
710		mitigate these consequences.	
711			

712 **PART 16, APPENDIX 16A:**

713 **SUBJECTS TO BE INCLUDED IN TRAINING COURSES FOR LOGGING SUPERVISORS**

714 16A.1 Fundamentals of ~~R~~radiation ~~S~~safety including:

715 16A.1.1 Characteristics of radiation

716 16A.1.2 Units of radiation dose and quantity of radioactivity

717 16A.1.3 ~~Significance of radiation dose~~Hazards of exposure to radiation

718 ~~(1) — Radiation protection standards~~

719 ~~(2) — Biological effects of radiation dose~~

720 16A.1.4 Levels of radiation from sources of radiation

721 16A.1.5 Methods of controlling and minimizing radiation dose

722 (1) Working time

723 (2) Working distances

724 (3) Shielding

725 16A.1.6 Radiation safety practices including prevention of contamination and methods of  
726 decontamination  
727  
728

729 16A.2 Radiation ~~D~~detection ~~I~~instrumentation ~~T~~to ~~B~~be ~~U~~used

730 16A.2.1 Use of radiation survey instruments to include:

731 (1) Operation

732 (2) Calibration

733 (3) Limitations

734 16A.2.2 Survey techniques

735 16A.2.3 Use of personnel monitoring equipment

736 16A.3 Equipment ~~T~~to ~~B~~be ~~U~~used including:

737 16A.3.1 ~~Handling equipment~~Operation of equipment, including source handling equipment and  
738 remote handling tools

739 16A.3.2 Sources of radiation \_\_\_\_\_

740 16A.3.3 Storage, ~~and control,~~ and disposal of ~~equipment~~sources of radiation

741 16A.3.4 ~~Operation and control~~Maintenance of equipment

742 16A.4 The Requirements of ~~P~~ertinent Federal and State Regulations

**Comment [jsj81]:** For formatting purposes, a page break is inserted at the top of Appendix A.

**Comment [jsj82]:** Appendix 16A is amended for consistency with 10 CFR Part 39.61(e).

The proposed changes primarily involve minor wording changes and formatting.

NRC Compatibility = B

**Comment [jsj83]:** Provision 16A.1.3 is updated consistent with 10 CFR 39.61(e).

Language is updated/removed at the request of NRC in correspondence dated March 18, 2016 and differ from that in SSRCR Part W.

NRC Letter 03/18/16.  
NRC Compatibility = B

**Formatted:** Tab stops: 2.69", Left

743 ~~16A.5 The Licensee's or Registrant's Written Operating and Emergency Procedures~~

744 ~~16A.6 The Licensee's or Registrant's Record Keeping Procedures~~

745 16A.5 Case histories of accidents in well logging

746

747

748

749

750

751

752

753

754

755

756

757

758

759 |

**Comment [jsj84]:** Provision 16.A.5 and 16.A.6 are deleted consistent with 10 CFR 39.61.

Language is updated at the request of NRC in correspondence dated March 18, 2016 and differs from SSR CR Part W which retains these provisions.

NRC Letter 03/18/16.  
NRC Compatibility = B

**PART 16, APPENDIX 16B:**

**Comment [jsj85]:** For formatting purposes, a page break is inserted at the top of Appendix B.

**EXAMPLE OF PLAQUE FOR IDENTIFYING WELLS CONTAINING SEALED SOURCES CONTAINING  
RADIOACTIVE MATERIAL ABANDONED DOWNHOLE**

[COMPANY NAME]

[WELL IDENTIFICATION]



**ONE 2 CURIE CS-137 RADIOACTIVE SOURCE**

**ABANDONED 3-3-75 AT 8400 FT. PLUG BACK DEPTH 8200 FT.**

**DO NOT RE-ENTER THIS WELL BEFORE CONTACTING**

**COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT**

The size of the plaque should be convenient for use on active or inactive wells, for example, a 7-inch square. Letter size of the word "CAUTION" should be approximately twice the letter size of the rest of the information, for example, 1/2-inch and 1/4-inch letter size, respectively.

---

**EDITOR'S NOTES**

6 CCR 1007-1 has been divided into separate parts for ease of use. Versions prior to 04/01/2007 are located in the first section, 6 CCR 1007-1. Prior versions can be accessed from the All Versions list on the rule's current version page. To view versions effective on or after 04/01/2007, select the desired part of the rule, for example 6 CCR 1007-1 Part 01 or 6 CCR 1007-1 Part 10.

**History**