



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

September 20, 2000

Mr. Lawrence J. Corte, Manager
Western Nuclear, Inc.
17222 South Golden Road, Suite A
Golden, CO 80401

SUBJECT: COMPLETION REPORT REVIEW FOR THE WESTERN NUCLEAR
SPLIT ROCK SITE, JEFFREY CITY, WYOMING
AMENDMENT 92 SOURCE MATERIAL LICENSE SUA-56

Dear Mr. Corte:

The U.S. Nuclear Regulatory Commission (NRC) staff has completed its review of the Western Nuclear Incorporated (WNI) Completion Report, submitted by letter dated April 21, 1999. Based on this review and inspection of the site on May 23-24, 2000, the staff has concluded that WNI has successfully completed the surface portion of decommissioning and reclamation at the Split Rock site. The staff's evaluation is attached in the Completion Report Review (CRR).

As a result of this action, License Conditions 27 and 75 have been deleted except the portion of License Condition 27 dealing with reclamation of the Winter Storage Ponds, which has moved to License Condition 74 (groundwater requirements). The deleted conditions outlined specific technical requirements of the reclamation plan and schedules of implementation. As per WNI's request from the September 14, 2000 phone conversation, License Condition 27.J was deleted. This is based on WNI's February 24, 2000 submittal regarding the disposal of soil samples from the radiological clean-up program and NRC verification of the disposal during the May 23-24, 2000 inspection. Also, the address for Western Nuclear, Inc., in License Condition 2, has been changed at your request. The result of this amendment is as follows:

2. Western Nuclear, Inc.

200 Union Boulevard, Suite 300
Lakewood, Colorado 80228

[Applicable Amendments: 34, 52, 92]

27. DELETED by Amendment No. 92.

[Applicable Amendments: 22, 56, 68, 71, 74, 75, 80, 81, 90, 92]

74. The licensee shall implement a compliance monitoring program containing the following:

A. Sample Southwest Valley Wells 1, B, 21, 24, 25, 16, 15, and Northwest Valley Wells 4, 5, 17, 19, 23, and 27, on a semiannual frequency for chloride, nitrate, sulfate, pH, TDS, water level, beryllium, cadmium, chromium, lead, nickel, radium-

September 20, 2000

226 and 228, selenium, thorium-230, and uranium.

- B. Comply with the following ground-water protection standards at point of compliance Well No. 4 and 21, with background being recognized in Well No. 15:

beryllium = 0.05 mg/l, cadmium = 0.01 mg/l, chromium = 0.05 mg/l, lead = 0.05 mg/l, nickel = 0.05 mg/l, radium-226 and 228 = 5 pCi/l, selenium = 0.013 mg/l, thorium-230 = 0.95 pCi/l, and uranium = 0.16 mg/l.

- C Implement a corrective action plan program that shall recover and evaporate between 6 and 15 million gallons of contaminated water based upon minimizing recharge to the tailings. This program shall be constructed as described in the August 31, and September 28, 1989, submittals as modified by the licensee's April 3, 1990, January 13, 1992, September 23, 1993, April 18, 1997, May 20, 1998, and July 2, 1999, submittals. The objective of the program shall be to return the concentrations of beryllium, cadmium, nickel, radium-226 and 228, selenium, thorium-230, and uranium to the concentration limits specified in Subsection 74B above. A final Corrective Action Program Plan, which includes a complete site characterization, must be received by NRC by October 31, 1999.

[Applicable Amendments: 25, 27, 36, 39, 40, 44, 48, 51, 56, 58, 61, 62, 67, 69A, 79, 89]

- D. The licensee shall submit by December 15 of each year, a review of the corrective action program and its effect on the aquifer.

[Applicable Amendments: 25, 27, 36, 39, 40, 44, 48, 51, 56, 58, 61, 62, 67, 69A, 79]

- E. **The licensee shall reclaim the groundwater corrective action evaporation ponds in accordance with their February 7, 1994, report titled, "Western Nuclear, Inc. Split Rock Mill, Addendum A (February 7, 1994) to Revision 5 to the June 30, 1987, Uranium Tailings Reclamation Plan," with the following exception:**

1. **The preliminary radon attenuation barrier design for the Winter Storage Ponds (Area 2C, Figure 4, Drawing No. 91-225-E53 (Addendum A to Revision 5) consists of 6 inches of Cody Shale and 12 inches of Soil Borrow. This design is considered acceptable for estimating the surety amount. However, once the storage ponds are dismantled, the Licensee shall confirm the design and obtain NRC approval prior to placing the radon cover on the ponds. Reclamation to the Winter Storage Ponds shall be completed by the licensee within three years after cessation of use as determined by the NRC.**

[Applicable Amendment: 92]

75. DELETED by Amendment No. 92.

[Applicable Amendments: 73, 77, 86, 91, 92]

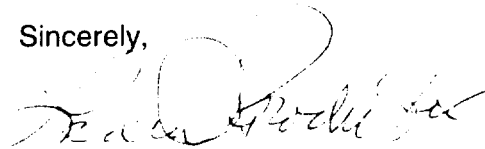
September 20, 2000

Corrective Action relating to groundwater contamination, as a result of operations at the mill, was not reviewed in this action. WNI's Groundwater Corrective Action Plan, submitted by letter dated October 31, 1999, is currently under review and a separate Technical Evaluation Report will be generated.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/NRC/ADAMS/index.html> (the Public Electronic Reading Room).

If you have any questions regarding this letter or the enclosures, please contact William von Till, the NRC Project Manager for the White Mesa mill, at (301) 415-6251 and he can also be reached by e-mail at rwv@nrc.gov.

Sincerely,



Philip Ting, Chief
Fuel Cycle Licensing Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Docket No. 40-8681
SUA-56, Amendment No. 92
Enclosure 1: Completion Report Review
Enclosure 2: Source Material License SUA-56

cc: R. Chancellor, WDEQ
Donna Bergman-Tabbert, DOE

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This Action closes out TAC# L51819

DISTRIBUTION (w/ Encl.): File Center FCSS r/f FCLB r/f BSpitzberg, RIV
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ADAMS ACCESSION NUMBER:

OFC	FCLB	FCLB	FCLB	FCLB	FCLB
NAME	WvonTill*	ARamirez*	DGillen*	STreby*	PTing <i>[Signature]</i>
DATE	8/28/00	8/31/00	9/05/00	9/19/00	09/20/00

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* See previous concurrence

ACNW: YES NO

Delete file after distribution: Yes No

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ADAMS ACCESSION NUMBER:

*no legal objection
 taken by ECP to comment
 noted*

OFC	FCLB	FCLB	FCLB	FCLB	FCLB
NAME	WvonTill	ARamirez	W. G. Gillen	STreby	PTing
DATE	8/28/00	8/13/00	9/15/00	9/19/00	

OFFICIAL RECORD COPY

ACNW: YES NO Delete file after distribution: Yes No

**WESTERN NUCLEAR SPLIT ROCK, JEFFREY CITY, WYOMING
TITLE II URANIUM MILL TAILINGS ACT
COMPLETION REVIEW REPORT**

DATE: August 29, 2000

DOCKET NO.: 40-1162

LICENSE NO.: SUA-56

LICENSEE: Western Nuclear Incorporated

FACILITY: Split Rock Site

**PROJECT
MANAGER:** William von Till

**TECHNICAL
REVIEWERS:** John Lusher - Health Physics
Dan Rom - Geotechnical Engineering
Ted Johnson - Erosion Protection and Surface Water Hydrology
Jill Caverly - Erosion Protection and Surface Water Hydrology

SUMMARY AND CONCLUSIONS:

WNI submitted by letter dated April 21, 1999, a final Completion Report (CR) for the Split Rock site. This report documented all surface reclamation activities at the site. Groundwater corrective action is included in WNI's October 31, 1999 submittal and is under a separate technical evaluation by the Fuel Cycle Safety and Safeguards staff and the Office of General Counsel (OGC). Technical review in the areas of Health Physics, Geotechnical Engineering, and Surface Water Hydrology were conducted in accordance with 10 CFR Part 40 and "The Standard Review Plan for the Review of a Reclamation Plan for Mill Tailings under Title II of the Uranium Mill Tailings Radiation Control Act" (NRC, 2000). A surface reclamation close-out inspection was conducted on May 23-24, 2000. Based on the review of the submittal and the close-out inspection, the staff finds the CR to be acceptable and in accordance with 10 CFR Part 40.

BACKGROUND

The Split Rock site is located in Jeffrey City, Wyoming. Mill operations commenced in 1958 and continued until 1981. Decommissioning of the mill was completed on September 15, 1988. Regrading and reshaping of the tailings began in 1990 which included the placement of coarse tailings over fine tailings, retrieval and disposal of windblown and contaminated soils from outside of the reclamation cover boundary, and borrow soils were placed over the regraded tailings to approximately the desired final reclamation subgrade configuration and interim soil was placed over the tailings. In 1992 vertical band drains (wicks) were employed to accelerate settlement and to assist in the tailings dewatering process.

Several borrow areas were developed to obtain construction materials. These included four borrow soils areas, a Cody Shale clay borrow area for obtaining clay for the radon barrier, and a

rock quarry (granite) developed on-site. A final reclamation cover, consisting of a radon barrier layer and soil borrow layer was placed over subgrade material. Four diversion ditches were provided to divert flood flows away from the reclaimed tailings. To prevent erosion, each diversion ditch was lined with a layer of riprap placed over one or two filter layers, depending on the D_{50} size of the riprap. Areas disturbed by construction were revegetated as of October 30, 1998.

SURFACE RECLAMATION CLOSE-OUT INSPECTION

On May 23-24, 2000, the NRC completed an inspection at the Split Rock site. Technical reviewers in the disciplines of Health Physics, Geotechnical Engineering, Surface Water Hydrology and Erosion Control, and Hydrogeology were present. A staff member from OGC was present. Also in attendance were representatives from the U.S. Department of Energy (DOE) and the Wyoming Department of Environmental Quality (DEQ). The technical reviewers from NRC completed an inspection of the surface reclamation activities and discussed potential long-term surveillance activities with the DOE. Aspects of the Groundwater Corrective Action Plan were also discussed.

No issues of concern, regarding the surface reclamation and CR, were found as a result of the inspection.

TECHNICAL EVALUATION

The following sections present the results of the review of reclamation performance by individual technical discipline:

Geotechnical Engineering Review Results

NRC staff reviewed the Split Rock CR to determine whether the geotechnical engineering aspects of the reclamation were completed in accordance with the applicable construction specifications in the approved reclamation plan. Items reviewed included descriptions of construction operations, as-built drawings, laboratory and field testing data, construction inspection reports, and quality assurance summaries. The review also was based on visual observations of the reclamation, and a review of testing and records made during on-site inspections.

The reclamation design included the placement of an earthen cover on the stabilized tailings. The cover was placed to reduce radon emanation from the tailings. The engineered cover also provides frost protection against degradation of the compacted soils.

NRC staff reviewed field and laboratory test records and determined that the material placement was in accordance with the project specifications. The review was based on NRC observations and a review of the written records made during reclamation. The CR also presented summaries of the testing that confirmed the specified testing frequencies were met.

During its review, the NRC staff noted the following:

1. Appropriate tests (gradation and Atterberg limits) and inspections were performed by the licensee to assure that the proper material type was placed in each phase of construction. Placement and compaction of construction materials were routinely inspected by the licensee to assure that the moisture and density requirements were

met and that the soil moisture was uniform throughout the compacted lifts. The loose thickness of the lifts was verified periodically by the licensee to ensure compliance with the specification requirements for each particular type of material.

2. Laboratory and field testing by the licensee was conducted in accordance with acceptable test procedures and by trained and qualified personnel. Records indicating acceptable calibration of measuring and testing equipment are provided in the CR.
3. The CR shows that frequencies of material testing and inspection comply with the frequencies specified in the NRC Staff Technical Position on Testing and Inspection Plans.
4. The radon barrier layer was continually inspected by the licensee to assure that the specified lift thicknesses and compaction levels were achieved.
5. The material type, placement, and compaction methods specified for the radon barrier layer resulted in the desired density of the barrier.
6. As-built drawings adequately document that the completed remedial action is consistent with the NRC-approved design.
7. Final slope, elevation, and compaction operations of the various cover layers were adequately inspected to ensure that the final conditions were consistent with those stated in the reclamation plan.

Based on the above observations, the NRC staff concludes that the geotechnical engineering aspects of construction were performed in accordance with the specifications identified in the reclamation plan and in accordance with 10 CFR Part 40, Appendix A.

Surface Water Hydrology and Erosion Protection Review Results

NRC staff reviewed the surface water hydrology and erosion protection aspects of remedial actions at the Split Rock site to ensure that they were constructed in accordance with the applicable construction specifications as stipulated in the reclamation plan. Areas of review included construction operations, laboratory and field testing, and quality assurance audits. In addition, the review was also based on NRC observations of the remedial actions and review of records and testing during NRC onsite inspections.

The reclamation design included erosion protection in several specific areas, including top slopes, side slopes, diversion channels, and rock toes at the outlets of the diversion channels. The riprap for the top and side slopes of the cell was designed to prevent long-term erosion and gullying of the cell cover. The riprap toes were placed to prevent erosion and migration of gullies.

The NRC staff reviewed each of these features and determined that testing, placement, and riprap configurations complied with specifications in the reclamation plan. The review was partially based on NRC staff observations and review of onsite records during the reclamation activities, as well as assessment of the verification results presented in the licensee's Completion Report. In addition, the NRC staff reviewed records of the placement of riprap on the top and side slopes of the cell and in the diversion channels.

During the review, the NRC staff noted the following:

1. Tests (gradation and durability) and inspections were performed by the licensee to ensure that erosion protection materials were properly selected. The review of the documentation indicated that placement of materials was routinely inspected to ensure that the rock size and gradation specifications were met. Likewise, the thickness of the rock layers were verified periodically by the licensee to ensure compliance with the specifications for the particular type of material.
2. Laboratory and field testing was conducted by the licensee in accordance with specified test procedures.
3. Testing and inspection frequencies for materials used at the site for erosion protection complied with the frequencies specified in the reclamation plan.

Based on NRC staff observations and review of onsite records during remedial actions, as well as assessment of the verification results presented in the CR, the NRC staff concludes that the required durability and gradation tests were performed during the remedial action. The riprap is of adequate quality and has been acceptably placed. The NRC staff concludes that reclamation activities at the Split Rock site have been completed in accordance with 10 CFR Part 40, Appendix A, with respect to erosion protection.

Radioactivity Cleanup and Control Review Results

The staff reviewed Section 3.0 "Health and Safety Program," and the information provided was considered acceptable.

In February 1999, the NRC staff reviewed the laboratory quality assurance data and the data for the radon barrier analysis, and concluded that the appropriate procedures were used and that the quality assurance data was within acceptable limits. The average measured radon flux (from 320 locations) was 0.88 pCi/m²s, compared to the limit of 20 pCi/m²s. Therefore, the data demonstrates that the WNI, Split Rock Site, meets the requirements of Criterion 6(2) of 10 CFR Part 40, for the total tailings area tested.

Additionally, by the completion of the radon barrier and the completion of the testing of the radon barrier, license condition 75A(3) can be deleted.

75A(3) Placement of final radon barrier designed and constructed to limit radon emissions to an average flux of no more than 20 pCi/m²/s above background.

The staff reviewed Appendix P and questioned why the data had been presented in values of "less than" instead of actual numbers. The licensee had acceptance criteria for the borrow soil of gamma radiation less than 18 uR/Hr (30 uR/Hr shine). The licensee provided the following response:

From 1994 through 10/3/97 the gamma survey measurements were reported in a range (ie. 13-17 uR/hr for 8/24/94) or less than format (ie. < 18 uR/hr for 8/20/97). The values were reported this way since the measurements were taken over an area where the readings varied by several uR/hr. In all cases however, any reading above the limit prompted the soil in that area to be removed until all readings were less than the limit.

After 10/6/97 the gamma survey readings were presented as singular values (ie. 12 uR/hr for 11/3/97). This change in reporting was prompted by an internal WNI audit where it was decided that a single value which represented the average of the readings over an area should be reported. However, as stated above, soil in all locations with readings greater than the limit were removed regardless of the overall average reading for the area.

The staff reviewed the data, and the response, and found them to be acceptable and in accordance with 10 CFR Part 40, Appendix A.

GROUNDWATER

Groundwater corrective action has been addressed by WNI in its October 31, 1999 submittal. This submittal is under review and will be evaluated under a separate technical evaluation.

LICENSE AMENDMENT

As a result of the approved CR, the license will be amended as indicated below:

License Condition 27 currently reads as follows:

27. The licensee shall reclaim the tailings disposal areas in accordance with the Tables and Figures, and Sections 1 through 5 and Section 7 of their February 7, 1994, report titled, "Western Nuclear, Inc. Split Rock Mill, Addendum A (February 7, 1994) to Revision 5 to the June 30, 1987, Uranium Tailings Reclamation Plan," with the following exceptions:
 - A. If a rock source other than the on-site source is used, durability testing must be performed and the results submitted to the NRC for review and approval prior to placement of materials from the alternate source.
 - B. The preliminary radon attenuation barrier design for the Winter Storage Ponds (Area 2C, Figure 4, Drawing No. 91-225-E53 (Addendum A to Revision 5) consists of 6 inches of Cody Shale and 12 inches of Soil Borrow. This design is considered acceptable for estimating the surety amount. However, once the storage ponds are dismantled, the Licensee shall confirm the design and obtain NRC approval prior to placing the radon cover on the ponds.
 - C. A completion report including as-built drawings, verifying that reclamation of the site has been performed according to the approved reclamation plan shall be provided within 6 months after completion of construction. The report shall also include summaries of results of the quality assurance and control testing to demonstrate that approved specifications were met.
 - D. One-point Proctor tests shall not be required during placement of the Cody shale.
 - E. The soil component of the erosion protection layer, consisting of soil/rock matrix, is deleted. This erosion protection layer, to be placed over the final surface reclamation soil cover, will consist of a minimum 4-inch thickness of rock with a minimum D_{50} of 2-inches.
 - F. For rock durability tests, the frequency, specified in Table 5, shall be one test series prior to placement and one test series for every 20,000 cubic yards of

- material from the rock source.
- G. For rock gradation tests, the frequency, specified in Table 5, shall be one test prior to placement and one test for every 10,000 cubic yards of each size of material produced, with a minimum of 3 tests for each material size. These gradation tests shall be performed as the material is being produced and prior to placement of material.
- H. The radon barrier for the northern portions of Area 1A and Area 1B shall be constructed in accordance with material types, thicknesses, and placement criteria described in the license amendment request, License Condition #27: Revisions to Surface Reclamation Design - License Condition #33: Addendum to Radiological Verification Program, dated March 31, 1997; and the supplemental information, dated May 12, 1997, and May 30, 1997.
- I. The thickness of the radon barrier in the 0.8 acre Area 2A shall be in accordance with the Western Nuclear, Inc. Western Nuclear Split Rock Site Redesign of Final Cover Thickness 0.8 Acre Area in Area 2A, transmitted to the NRC on July 25, 1997.
- J. Contaminated soil samples shall be disposed of in accordance with Western Nuclear, Inc.'s "Disposal Plan for Left-Over Samples Collected During Radiological Clean-Up Program at Split Rock Mill Site," dated July 26, 1999.

[Applicable Amendments: 22, 56, 68, 71, 74, 75, 80, 81, and 90]

With the approval of the CR and all surface reclamation activities, License Condition 27 will now read as follows:

27. DELETED by Amendment No. 92.

[Applicable Amendments: 22, 56, 68, 71, 74, 75, 80, 81, 90, 92]

License Condition 75 currently reads as follows:

- 75. The licensee shall complete site reclamation in accordance with the approved reclamation plan and groundwater corrective action plan, as authorized by License Condition Nos. 27 and 74, respectively, in accordance with the following schedules.
 - A. To ensure timely compliance with target completion dates established in the Memorandum of Understanding with the Environmental Protection Agency (56 FR 55432, October 25, 1991), the licensee shall complete reclamation to control radon emissions as expeditiously as practicable, considering technological feasibility, in accordance with the following schedule:
 - (1) Windblown tailings retrieval and placement on the pile - complete.
 - (2) Placement of the interim cover to decrease the potential for tailings dispersal and erosion - complete.

- (3) Placement of final radon barrier designed and constructed to limit radon emissions to an average flux of no more than 20 pCi/m²/s above background as described in WNI's submittal of June 14, 1994, and subsequently verified in submittals dated November 13, 1998, and January 18, 1999 - complete.
- B. Reclamation, to ensure required longevity of the covered tailings and groundwater protection, shall be completed as expeditiously as is reasonably achievable, in accordance with the following target dates for completion and as described in WNI's submittal of June 14, 1994:
- (1) Placement of erosion protection as part of reclamation to comply with Criterion 6 of Appendix A of 10 CFR Part 40.
 - (a) For areas 3A and 3B - June 30, 1995 (complete).
 - (b) For area 2B - June 30, 1996.
 - (c) For area 1C - June 30, 1997.
 - (d) For areas 1A, 1B, 2A, and 2C - June 30, 1999.
 - (2) Projected submittal of revised groundwater corrective action plan - October 31, 1999.
- C. Any license amendment request to revise the completion dates specified in Section A must demonstrate that compliance was not technologically feasible (including inclement weather, litigation which compels delay to reclamation, or other factors beyond the control of the licensee).
- D. Any license amendment request to change the target dates in Section B above, must address added risk to the public health and safety and the environment, with due consideration to the economic costs involved and other factors justifying the request such as delays caused by inclement weather, regulatory delays, litigation, and other factors beyond the control of the licensee.

[Applicable Amendments: 73, 77, 86, 91]

With the approval of the Completion Report and all surface reclamation activities, License Condition 75 will now read as follows:

75. DELETED by Amendment No. 92.

[Applicable Amendments: 73, 77, 86, 91, 92]

The requirements for the evaporation pond reclamation were moved into License Condition 74. License Condition 74 presently reads as follows:

74. The licensee shall implement a compliance monitoring program containing the following:

- A. Sample Southwest Valley Wells 1, B, 21, 24, 25, 16, 15, and Northwest Valley Wells 4, 5, 17, 19, 23, and 27, on a semiannual frequency for chloride, nitrate, sulfate, pH, TDS, water level, beryllium, cadmium, chromium, lead, nickel, radium-226 and 228, selenium, thorium-230, and uranium.
- B. Comply with the following ground-water protection standards at point of compliance Well No. 4 and 21, with background being recognized in Well No. 15:

beryllium = 0.05 mg/l, cadmium = 0.01 mg/l, chromium = 0.05 mg/l, lead = 0.05 mg/l, nickel = 0.05 mg/l, radium-226 and 228 = 5 pCi/l, selenium = 0.013 mg/l, thorium-230 = 0.95 pCi/l, and uranium = 0.16 mg/l.
- C. Implement a corrective action plan program that shall recover and evaporate between 6 and 15 million gallons of contaminated water based upon minimizing recharge to the tailings. This program shall be constructed as described in the August 31, and September 28, 1989, submittals as modified by the licensee's April 3, 1990, January 13, 1992, September 23, 1993, April 18, 1997, May 20, 1998, and July 2, 1999, submittals. The objective of the program shall be to return the concentrations of beryllium, cadmium, nickel, radium-226 and 228, selenium, thorium-230, and uranium to the concentration limits specified in Subsection 74B above. A final Corrective Action Program Plan, which includes a complete site characterization, must be received by NRC by October 31, 1999.

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- D. The licensee shall submit by December 15 of each year, a review of the corrective action program and its effect on the aquifer.

[Applicable Amendments: 25, 27, 36, 39, 40, 44, 48, 51, 56, 58, 61, 62, 67, 69A, 79]

With this amendment, License Amendment 74 will read as follows:

- 74. The licensee shall implement a compliance monitoring program containing the following:
 - A. Sample Southwest Valley Wells 1, B, 21, 24, 25, 16, 15, and Northwest Valley Wells 4, 5, 17, 19, 23, and 27, on a semiannual frequency for chloride, nitrate, sulfate, pH, TDS, water level, beryllium, cadmium, chromium, lead, nickel, radium-226 and 228, selenium, thorium-230, and uranium.
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[Applicable Amendment: 92]

In addition, the licensee's address will change from:

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200 Union Boulevard, Suite 300
Lakewood, Colorado 80228

[Applicable Amendments: 34, 52]

To:

2. Western Nuclear, Inc.

17222 South Golden Road, Suite A
Golden, CO 80401

[Applicable Amendments: 34, 52, 92]

REFERENCES

U.S. Nuclear Regulatory Commission (NRC) "The Standard Review Plan for the Review of a Reclamation Plan for Mill Tailings under Title II of the Uranium Mill Tailings Radiation Control Act". June, 2000.

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

<p>1. Licensee Western Nuclear, Inc.</p> <p>2. 17222 South Golden Road, Suite A Golden, Colorado 80228 [Applicable Amendments: 34, 52, 92]</p>	<p>3. License Number SUA-56, Amendment No. 92</p> <hr/> <p>4. Expiration Date Until Terminated (Applicable Amendments: 31, 32, 38, 41)</p> <hr/> <p>5. Docket or Reference No. 40-1162</p>
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<p>6. Byproduct, Source, and/or Special Nuclear Material</p> <p style="text-align: center;">Natural Uranium</p>	<p>7. Chemical and/or Physical Form</p> <p style="text-align: center;">Any</p>	<p>8. Maximum Amount that Licensee May Possess at Any One Time Under This License</p> <p style="text-align: center;">Unlimited</p>
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9. The licensee is hereby authorized to possess byproduct material in the form of uranium waste tailings generated by the licensee's past milling operations authorized under SUA-56. [Applicable Amendments: 32, 46, 58]

10. Authorized Places of Use: The licensee's uranium milling facilities located approximately two miles north of Jeffrey City, Wyoming.
[Applicable Amendments 46, 50, 60, 82]

- 11. DELETED by Amendment No. 49.
- 12. DELETED by Amendment No. 49.
- 13. DELETED by Amendment No. 49.
- 14. DELETED by Amendment No. 49.
- 15. DELETED by Amendment No. 49.
- 16. DELETED by Amendment No. 54.
- 17. DELETED by Amendment No. 33.
- 18. DELETED by Amendment No. 49.
- 19. DELETED by Amendment No. 56.
- 20. DELETED by Amendment No. 49.

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- 21. DELETED by Amendment No. 56.
- 22. DELETED by Amendment No. 54.
- 23. DELETED by Amendment No. 33.
- 24. The licensee shall implement the environmental monitoring program outlined in Table 2 of its guidance titled "Current Environmental Monitoring Program," dated November 14, 1988. The licensee shall sample three surface water locations, S-5 [Sweetwater Below Mill], S-6 [Sweetwater Across from Mill], and S-7 [Sweetwater Above Mill], at the same sampling frequency and for the same constituents [excluding static water level] as required under LC No. No. 74A. The data obtained from this monitoring program shall be reported semiannually to the NRC in accordance with requirements of 10 CFR 40.65.

[Applicable Amendments: 26, 28, 30, 44, 49, 56A, 84, 89]

- 25. The licensee shall conduct a quality assurance program as contained in their submittal dated March 25, 1981. In addition, the licensee shall be required to document the results and recommendations of each annual audit of the environmental monitoring program. Any requested changes to the "Environmental Monitoring Manual" submitted on March 23, 1981, as revised by letters dated March 27, 1991, January 28 and March 11, 1992, shall be in the form of a license amendment.

[Applicable Amendments: 49, 63]

- 26. DELETED by Amendment No. 49.
- 27. DELETED by Amendment No. 92.

[Applicable Amendments: 22, 56, 68, 71, 74, 75, 80, 81, 90 and 92]

- 28. DELETED by Amendment No. 87.
- 29. The licensee shall maintain an NRC-approved financial surety arrangement, consistent with 10 CFR 40, Appendix A, Criteria 9 and 10, adequate to cover the estimated costs, if accomplished by a third party, for decommissioning and decontamination of the mill and mill site, for reclamation of any tailings or waste disposal areas, ground-water restoration as warranted and the long-term surveillance fee. Within 3 months of NRC approval of a revised reclamation/decommissioning plan, the licensee shall submit, for NRC review and approval, a proposed revision to the financial surety arrangement if estimated costs in the newly approved plan exceed the amount covered in the existing financial surety. The revised surety shall then be in effect within 3 months of written NRC approval.

Annual updates to the surety amount, required by 10 CFR 40, Appendix A, Criteria 9 and 10, shall be submitted to the NRC at least 3 months prior to the anniversary date which is designated as December 30 of each year. If the NRC has not approved a proposed revision to the surety coverage 30 days prior to the expiration date of the existing surety arrangement, the licensee shall extend the existing surety arrangement for 1 year. Along with each proposed revision or annual update, the

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licensee shall submit supporting documentation showing a breakdown of the costs and the basis for the cost estimates with adjustments for inflation, maintenance of a minimum 15 percent contingency fee, changes in engineering plans, activities performed and any other conditions affecting estimated costs for site closure. The licensee shall also provide the NRC with all surety related correspondence submitted to the State, a copy of the State's surety review, and the final approved surety arrangement. The licensee shall also ensure that the surety, where authorized to be held by the State, expressly identifies the NRC portion of the surety. The basis for the cost estimate is the NRC approved reclamation/decommissioning plan or NRC approved revisions to the plan. The previously provided guidance entitled "Recommended Outline for Site Specific Reclamation and Stabilization Cost Estimates" outlines the minimum considerations used by the NRC in the review of site closure cost estimates. Reclamation/ decommissioning plans and annual updates should follow this outline.

Western Nuclear's currently approved surety, issued by American Home Assurance Company on October 26, 1998, in favor of the U. S. Nuclear Regulatory Commission, shall be continuously maintained in an amount no less than \$11,439,100 for the purpose of complying with 10 CFR 40, Appendix A, Criterion 9 and 10, until a replacement is authorized by the NRC.

[Applicable Amendments: 24, 45, 53, 64, 66, 70, 72, 76, 85P]

30. DELETED by Amendment No. 69.

31. DELETED by Amendment No. 46.

32. A. DELETED by Amendment No. 56.

B. DELETED by Amendment No. 50.

33. DELETED By Amendment No. 88

34. In order to ensure that no disturbance of cultural resources occurs in the future, the licensee shall have an archeological and historical artifact survey of areas of its property, not previously surveyed, performed prior to their disturbance, including borrow areas to be used for reclamation cover. These surveys must be submitted to the NRC and no such disturbance shall occur until the licensee has received authorization from the NRC to proceed.

The licensee is authorized to excavate material from the proposed reclamation borrow areas as designated in the licensee's approved reclamation plan, provided that protection of the cultural resources is managed in accordance with statements and representation contained in the licensee's letter dated March 30, 1992.

[Applicable Amendment: 71]

35. Before engaging in any project-related activity not evaluated by the NRC, the licensee shall prepare and record an environmental evaluation of such activity. When the evaluation indicates such activity may result in a significant adverse environmental impact that was not evaluated, or an impact greater than that evaluated in the environmental statement, the licensee shall provide a written evaluation of such activity and obtain prior approval of the NRC for the activity.

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- 36. DELETED by Amendment No. 49.
- 37. The licensee is hereby exempted from the requirements of Section 20.203(e)(2) of 10 CFR Part 20, provided that all entrances to the restricted area are conspicuously posted in accordance with Section 20.203(e)(2) and with words, "Any area within this facility may contain radioactive material."

[Applicable Amendment: 49]
- 38. Mill tailings other than samples for research shall not be transferred from the site without specific prior approval of the NRC obtained through application for amendment of this license. The licensee shall maintain a permanent record of all transfers made under the provisions of this condition.
- 39. DELETED by Amendment No. 50.
- 40. DELETED by Amendment No. 49.
- 41. Release of equipment or packages from the restricted area shall be in accordance with the previously provided guidance entitled, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct or Source Materials," dated September, 1984.
- 42. The Radiation Safety Officer (RSO) shall perform an annual review of the radiation protection program for content and implementation. A copy of the annual review report shall be retained at the site and shall be available for NRC review.

[Applicable Amendments: 49, 87]
- 43. The results of sampling, analysis surveys and monitoring, the calibration of equipment, reports on inspections, and the additional conditions to this license, as well as any subsequent reviews, investigations, and corrective actions, shall be documented. Unless otherwise specified in NRC regulations, all such documentation shall be maintained for a period of at least 5 years.

[Applicable Amendment: 49, 87]
- 44. Written procedures shall be established for site reclamation and monitoring activities to include personnel and environmental monitoring, and survey instrument calibrations. These procedures shall be reviewed and approved in writing by the Radiation Safety Officer (RSO) before implementation and whenever a change in procedure is proposed to ensure that proper radiation protection principles are being applied. In addition, the RSO shall perform a documented review of all existing site procedures at least annually. An up-to-date copy of each written procedure shall be kept at the site facility.

[Applicable Amendments: 49, 56, 87]
- 45. DELETED by Amendment No. 49.
- 46. DELETED by Amendment No. 87.
- 47. DELETED by Amendment No. 49.

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46. DELETED by Amendment No. 87.
47. DELETED by Amendment No. 49.
48. The Radiation Safety Office (RSO), who is responsible for the radiation safety aspects of the decommissioning, shall possess the minimum qualifications as specified in Section 2.4.1 of Regulatory Guide 8.31, "Information Relevant to Ensuring That Occupational Radiation Exposure at Uranium Mills Will Be As Low As Reasonably Achievable," until license termination.

[Applicable Amendments: 49, 50, 56, 87]
49. DELETED by Amendment No. 49.
50. DELETED by Amendment No. 49.
51. DELETED by Amendment No. 49.
52. DELETED by Amendment No. 49.
53. Radiation detection instruments shall be calibrated after repair and as recommended by the manufacturer or at intervals not to exceed six months, whichever is sooner.
54. DELETED by Amendment No. 49.
55. DELETED by Amendment No. 49.
56. DELETED by Amendment No. 49.
57. DELETED by Amendment No. 33.
58. DELETED by Amendment No. 37.
59. DELETED by Amendment No. 49.
60. DELETED by Amendment No. 49.
61. DELETED by Amendment No. 49.
62. DELETED by Amendment No. 49.
63. DELETED by Amendment No. 56.
64. The licensee shall control grazing to the N and NNE of the tailings impoundment by maintaining cattle guards at each end of the rock outcrops along the north side of the restricted area fence, as indicated on map A, submitted by letter dated August 18, 1978 from G. Fletcher to J. Linehan.
65. DELETED by Amendment No. 49.
66. DELETED by Amendment No. 33.
67. DELETED by Amendment No. 33.

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- 68. DELETED by Amendment No. 46.
- 69. DELETED by Amendment No. 46.
- 70. DELETED by Amendment No. 49.
- 71. DELETED by Amendment No. 49.
- 72. DELETED by Amendment No. 49.
- 73. DELETED by Amendment No. 54.
- 74. The licensee shall implement a compliance monitoring program containing the following:
 - A. Sample Southwest Valley Wells 1, B, 21, 24, 25, 16, 15, and Northwest Valley Wells 4, 5, 17, 19, 23, and 27, on a semiannual frequency for chloride, nitrate, sulfate, pH, TDS, water level, beryllium, cadmium, chromium, lead, nickel, radium-226 and 228, selenium, thorium-230, and uranium.
 - B. Comply with the following ground-water protection standards at point of compliance Well No. 4 and 21, with background being recognized in Well No. 15:

beryllium = 0.05 mg/l, cadmium = 0.01 mg/l, chromium = 0.05 mg/l, lead = 0.05 mg/l, nickel = 0.05 mg/l, radium-226 and 228 = 5 pCi/l, selenium = 0.013 mg/l, thorium-230 = 0.95 pCi/l, and uranium = 0.16 mg/l.
 - C. Implement a corrective action plan program that shall recover and evaporate between 6 and 15 million gallons of contaminated water based upon minimizing recharge to the tailings. This program shall be constructed as described in the August 31, and September 28, 1989, submittals as modified by the licensee's April 3, 1990, January 13, 1992, September 23, 1993, April 18, 1997, May 20, 1998, and July 2, 1999, submittals. The objective of the program shall be to return the concentrations of beryllium, cadmium, nickel, radium-226 and 228, selenium, thorium-230, and uranium to the concentration limits specified in Subsection 74B above. A final Corrective Action Program Plan, which includes a complete site characterization, must be received by NRC by October 31, 1999.

[Applicable Amendments: 25, 27, 36, 39, 40, 44, 48, 51, 56, 58, 61, 62, 67, 69A, 79, 89]
 - D. The licensee shall submit by December 15 of each year, a review of the corrective action program and its effect on the aquifer.

[Applicable Amendments: 25, 27, 36, 39, 40, 44, 48, 51, 56, 58, 61, 62, 67, 69A, 79]
 - E. The licensee shall reclaim the groundwater corrective action evaporation ponds in accordance with their February 7, 1994, report titled, "Western Nuclear, Inc. Split Rock Mill, Addendum A (February 7, 1994) to Revision 5 to the June 30, 1987, Uranium Tailings Reclamation Plan," with the following exception:
 - 1 The preliminary radon attenuation barrier design for the Winter Storage Ponds (Area 2C, Figure 4, Drawing No. 91-225-E53 (Addendum A to Revision 5) consists of 6 inches of Cody Shale and 12 inches of Soil Borrow. This design is considered acceptable for estimating the surety amount. However, once the storage ponds are

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dismantled, the Licensee shall confirm the design and obtain NRC approval prior to placing the radon cover on the ponds. Reclamation to the Winter Storage Ponds shall be completed by the licensee within three years after cessation of use as determined by the NRC.

[Applicable Amendment: 92]

75. DELETED by Amendment No. 92.

[Applicable Amendments: 73, 77, 86, 91 and 92]

76. Notification to NRC under 10 CFR 20.2202, 10 CFR 40.60, and specific license conditions should be made as follows:

Required written notice to NRC under this license should be given to: Chief, Uranium Recovery and Low-Level Waste Branch, Division of Waste Management, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

[Applicable Amendment: 73]

FOR THE NUCLEAR REGULATORY COMMISSION

Date: 5/4/2010



Philip Ting, Chief
Fuel Cycle Licensing Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material
Safety and Safeguards