UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 25, 2018

MEMORANDUM TO: Bill Von Till, Chief
Uranium Recovery Licensing Branch
Division of Decommissioning, Uranium Recovery,
and Waste Management
Office of Nuclear Material Safety
and Safeguards

FROM: Douglas Mandeville, Project Manager ***/RA/***
Uranium Recovery Licensing Branch
Division of Decommissioning, Uranium Recovery,
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Office of Nuclear Material Safety
and Safeguards

SUBJECT: SUMMARY OF JANUARY 17, 2018, MEETING WITH POWER RESOURCES, INC. ON NRC REQUESTS FOR ADDITIONAL INFORMATION ON HEALTH PHYSICS TOPICS

On January 17, 2018, NRC staff held a teleconference with Power Resources, Inc. (PRI), doing business as Cameco Resources. The purpose of the meeting was to discuss the NRC staff's requests for additional information on health physics topics related to the renewal of Source Material License SUA-1548 at its Smith Ranch-Highland Uranium Project (SR-HUP) in-situ recovery facility. The Meeting Summary; List of Attendees; and Meeting Agenda are enclosed.

Docket Number: 40-8964
License Number: SUA-1548

Enclosures:
1. Meeting Summary
2. List of Attendees
3. Meeting Agenda

cc: Meeting Attendees (via email)

CONTACT: Douglas Mandeville, NMSS/DUWP
(301) 415-0724

SUBJECT: SUMMARY OF JANUARY 17, 2018, MEETING WITH POWER RESOURCES, INC. ON NRC REQUESTS FOR ADDITIONAL INFORMATION ON HEALTH PHYSICS TOPICS, **Dated** January 25, 2018

DISTRIBUTION: GSuber attendees via email

ADAMS Accession Number: ML18022A872

OFFICE	DUWP
NAME	D. Mandeville
DATE	01/25/18

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MEETING SUMMARY

DATE: January 17, 2018

TIME: 10:00 a.m. to 11:15 a.m.

PLACE: Teleconference

PURPOSE: The purpose of the meeting was to discuss the U.S. Nuclear Regulatory Commission (NRC) staff's requests for additional information (RAIs) on health physics topics related to renewal of the Smith Ranch-Highland Uranium Project (SR-HUP) source material license.

ATTENDEES:

See List of Attendees (Enclosure 2).

BACKGROUND:

Power Resources, Inc., (PRI) doing business as Cameco Resources, is the licensee for the SR-HUP uranium in situ recovery (ISR) facility in Converse County, Wyoming. PRI is authorized to operate SR-HUP under Source Material License SUA-1548.

PRI provided information on its health physics program in support of its license renewal application. The NRC staff issued its RAI on May 2, 2013 (NRC's Agencywide Documents Access and Management System (ADAMS) Accession Number ML13098A040) and received responses from PRI by letters dated November 18, 2014 (ADAMS Accession No. ML14353A314) and April 21, 2015 (ADAMS Accession No. ML16063A418). The NRC performed an acceptance review of the RAI related to airborne effluent and environmental monitoring (RAI 45) and informed PRI, in a letter dated August 7, 2015 (ADAMS Accession No. ML15190A391), that this RAI response did not contain sufficient information for the staff to proceed with its review. Subsequently, the NRC staff informed PRI, in a letter dated May 2, 2016 (ADAMS Accession No. ML16109A207), that it needed additional information for 27 of the 115 RAIs in order for the NRC staff to proceed with its review. By e-mail dated June 30, 2016, PRI stated that it continued to work on its response to the RAI on airborne effluent and environmental monitoring (RAI 45) and did not have an anticipated date for a submittal to the NRC staff at that time (ADAMS Accession No. ML16190A101). The NRC requested from PRI, in a letter dated December 12, 2016 (ADAMS Accession No. ML16274A191), a revised schedule for completion of the license renewal request. In response, PRI stated, in a letter dated January 10, 2017 (ADAMS Accession No. ML17025A075) that additional communication between the NRC and PRI was necessary on RAIs related to health physics, but did not provide a revised schedule.

On November 17, 2017, the NRC staff provided an update on the schedule for the review of PRI's license renewal request for SR-HUP (ADAMS Accession No. ML17174A904). In this letter, the NRC staff stated its intention to complete its review of PRI's renewal request for SR-HUP prior to the turnover of its oversight responsibilities to the State of Wyoming under the NRC's Agreement State program. To allow for sufficient time for the NRC staff to complete its review, the NRC staff requested that PRI address the remaining RAI responses by January 19, 2018. The NRC staff and PRI held a public meeting on December 6, 2017 to discuss

PRI's RAI responses related to hydrogeology (ADAMS Accession No. ML17353A793).

The NRC staff observes that two public meetings, held in September 2016 and September 2017, discussed health physics issues with uranium recovery licensees. Summaries of these workshops were sent to meeting participants, in part, for possible application of NRC staff guidance on their health physics programs (ADAMS Accession Nos. ML16270A042 and ML17262A499, respectively).

DISCUSSION:

Key discussion points from the meeting are summarized below. Doug Mandeville read the opening statement for the meeting, which included an overview of the discussion topics planned for this meeting. Enclosure 3 summarizes the meeting agenda.

Larry Reimann provided an update on the RAI response being prepared by PRI. PRI's focus has been on addressing the hydrological / groundwater RAIs, and completing the Mine Unit 1 Alternate Concentration Limit submittal by early February 2018. PRI is developing a schedule for submitting the hydrological / groundwater RAIs.

The NRC staff and PRI discussed additional RAIs issued August 7, 2015 (ADAMS Accession No. ML15190A391), which were related to health physics RAI 45, dated May 2, 2013 (ADAMS Accession No. ML13098A040) on the topic of airborne effluent and environmental monitoring. The RAI numbers below refer to the NRC staff's August 7, 2015 letter.

RAI 1

David Brown, NRC Senior Health Physicist, described two methods in common use at ISR facilities for measuring radon-222 from vents, wellheads, and other sources. These are methods the NRC staff has accepted at this time: (1) direct measurement of airborne radon-222 at the source; and (2) monitoring of incoming and exiting circulation fluids at the central processing plant in order to determine the net radon-release to the atmosphere. The second measurement method has been approved for use at other ISRs in Wyoming and Texas. As stated in a September 14, 2017, meeting between NRC staff and the UR industry on health physics topics (ADAMS Accession No. ML17262A496), the NRC staff has approved six effluent monitoring plans, two of which include the second measurement method described above. Additional information on those methods is provided in NRC correspondence dated November 19, 2015 (ADAMS Accession No. ML15302A405) and June 13, 2017 (ADAMS Accession No. ML17144A198). Mr. Reimann indicated that although PRI is measuring effluent releases at stacks for its Crowe Butte facility, and this method would be a departure from their existing approach, they would consider evaluating its application for SR-HUP.

With regard to the specific information requested in RAI 1, Mr. Brown noted that Section 7.3.3.5.1 of the April 2015 revision of the Technical Report (TR) stated that only tanks that are considered to be significant sources of radon emissions will be sampled. The NRC staff requested clarification of PRI's proposed radon monitoring program for the Smith Ranch, Highland, and satellite facilities.

A. RAI 1.A. The NRC staff requested a list of tanks that have the potential to contain significant sources of radon and that will be included in the sampling program. During this meeting, PRI was asked to provide a more detailed description of the sample

points for their current effluent monitoring program.

B. RAI 1.B. The NRC staff requested a description of the how radon daughter activity is addressed for all radon sources originating from the Smith Ranch, Highland, and satellite facilities. During this meeting, PRI was asked to provide an explanation of how they are using their Pylon Electronics Inc. Lucas-type scintillation detector with regards to accounting for radon-222 progeny activity. Specifically, PRI should provide the assumptions concerning radioactive equilibrium of radon progeny in its reporting of effluents using these measurement devices.

C. RAI 1.C. The NRC staff requested drawings that show in greater detail the current tank vent connections, for verification of radon sampling points. PRI should provide this information, if it does not pursue the alternative radon in circulation fluid sampling method described above.

D. RAI 1.D. The NRC staff requested information on the air flow through open doors and justification for disregarding this pathway, if applicable. Mr. Reimann stated that the buildings are maintained at a negative pressure, and that ventilation systems operate continuously, unless there is an operational disturbance that shuts them down. Also, the levels of radon-222 in buildings are measured for worker protection, and do not constitute a significant source of radon-222, in comparison to the levels of radon-222 that are released from equipment via stacks. PRI should provide a summary of this discussion, and justify that air flow through open doors is not a significant pathway.

RAI 2

Section 7.3.3.5.1 of the revised TR states that radon concentrations in air released from the header houses will be based on four production and four restoration header houses monitored with track etch detectors. Track etch detectors measure radon gas and do not measure radon progeny. Also, average radon emission per header house will be attributed to the remaining operational header houses in each group. The NRC staff requested additional information on how the radon measurements using track etch devices will be used to estimate radon progeny effluent quantities. The NRC staff noted that some ISR licensees assume equilibrium between radon and short-lived radon progeny in their effluent monitoring programs. This approach has been accepted by the NRC staff.

RAI 3

Section 7.3.3.5.1 of the revised TR states that the amount of radon released from production wells is minor compared to the quantity released from the central processing plant, satellite facilities and header houses. The staff requested clarification of PRI's proposed plan to account for radon effluent quantities from wellfields. Mr. Brown noted that comprehensive measurements in the wellfield are not necessary because a small number of representative samples is sufficient to characterize this source term. Also, he explained that other ISR licensees have made similar measurements, which may be applicable to the Smith Ranch Highlands facility. However, consistent with the staff's regulatory position 3.3 in Regulatory Guide 8.30 regarding unmonitored effluents, PRI could determine whether radon releases from wellfields contribute less than 30 percent of SR-HUP airborne effluent for the purpose of monitoring. If the releases are below 30 percent, PRI would need to account for this source but may not be required perform operational monitoring.

Also, the NRC staff noted that the revised TR states that radon concentration from spills would be based on an estimate using MILDOS. Mr. Reimann provided additional information on this topic by stating that PRI will conservatively assume that 100 percent of the radon in a spill would be released, for the purpose of estimating the amount of released radon.

RAI 4

Section 5.10.1 of the revised TR states that environmental monitoring station AS-2 represents the highest potential exposure to a member of the public, while environmental monitoring station AS-3 represents the nearest downwind resident. The NRC staff requested a description of what individual will receive the highest dose, for purposes of compliance with 10 CFR 20.1302(b)(1). Mr. Brown clarified this request by providing additional information on the potential exposure scenarios that should be evaluated in response to this request. Specifically, package delivery personnel and nearby members of the public at the Vollman and Sundquist residences should be evaluated in PRI's response to this RAI. He noted that two air samplers were identified in the license renewal application, and that Appendix L provides a MILDOS-AREA calculation which shows the Sundquist Ranch receives the highest dose. However, in performing this calculation, PRI assumed Sundquist Ranch is only one kilometer south of the central processing facility, instead of four kilometers. Accordingly, PRI should check Appendix L for errors and determine whether the Vollman ranch is the location of maximum dose to an offsite individual member of the public, rather than the Sundquist residence.

Also, the NRC staff noted that page 7-28 of the revised TR contains a commitment for PRI to demonstrate compliance with public dose limit for potential receptors at or near site for 50 hours a year. This item should be explained in PRI's periodic submittal of semi-annual effluent and environmental monitoring report required by 10 CFR 40.65.

RAI 5

Section 7.3.3.5.1 of the revised TR states that the annual radon concentration at the receptor will be determined by calculating the average net radon concentration at the receptor location. However, the staff requests additional description of how PRI will estimate background concentrations of radon for the purpose of estimating a net concentration of radon attributed to facility operations. An acceptable approach, wherein background measurements are concurrent with operational measurements, is described in the *FSME Interim Staff Guidance FSME-ISG-01 Evaluations of Uranium Recovery Facility Surveys of Radon and Radon Progeny in Air and Demonstrations of Compliance with 10 CFR 20.1301: Revised Draft Report for Comment;* March 20, 2014 (ADAMS Accession No. ML13310A198).

RAI 6

Section 7.3.3.5.1 of the revised TR states that an alternate approach to measuring net radon concentrations at a receptor location is to utilize release rates for radon from all source terms at the facility and to use this information as input into the MILDOS-AREA atmospheric dispersion code to calculate a dose at a receptor location. However, MILDOS-AREA has not been approved by NRC for purposes of annual demonstrations of compliance under 10 CFR 20.1302(b)(1). For this reason, the NRC staff stated the first dose assessment method described in the first five paragraphs of Section 7.3.3.5.1 of the revised TR is an acceptable approach. The methods described in Section 7.3.3.5.1 starting with the paragraph that begins,

"The alternate method...," describe approaches to estimate effluent quantities, which are required to demonstrate compliance with 10 CFR 40.65, and could be retained for that purpose.

The remaining two RAIs discussed, RAI 37 and RAI 46, were related to the NRC staff's initial RAI letter dated May 2, 2013.

RAI 37

Section 5.8.6 of the revised TR provides surface contamination survey procedures for personnel and equipment leaving the restricted area. The NRC staff requested a description of beta survey equipment and procedures to be used for contamination control and release of personnel and equipment. Section 5.8.6 has been revised and Addendum 1 to Appendix I has been added to provide a description of the equipment used for contamination control and release of personnel and equipment.

Mr. Reimann described the application of alpha-only surveys in comparison to alpha-beta surveys for personnel monitoring, facility monitoring within a controlled area, and surveys of materials and equipment for unrestricted release. PRI is currently reevaluating this aspect of their health physics program. In response, Mr. Brown provided an overview of NRC guidance on this topic, including the Standard Review Plan, Regulatory Guide 8.30, and Fuel Cycle Policy and Guidance Directive 83-23, along with their proper application. It is acceptable to use the guidance in Regulatory Guide 8.30 (i.e., alpha surveys against the limits in Table 2 of Regulatory Guide 8.30) for contamination control, including personnel exit surveys and area contamination surveys (e.g., lunch rooms). However, for release of equipment, packages, and materials for unrestricted use, the guidelines in Fuel Cycle Policy and Guidance Directive 83-23 provide separate limits for alpha-emitting and beta/gamma-emitting radionuclides, which apply independently.

RAI 46

Section 5.10.1.2 of the revised TR contains information on soil and vegetation sampling at air particulate monitoring stations. PRI plans to initiate an alternative soil sampling program at these locations that entails collection of three soils samples annually from a location of maximum concentration, and evaluate the samples to demonstrate the absence of radiological impact. This sampling would be conducted for three years to establish trends, for the purpose of possibly modifying the environmental sampling program in the future by justifying the elimination of continued collection of these samples.

PRI plans to describe their proposed changes in greater detail, and submit it to the NRC staff for review and approval.

ACTION ITEMS:

The following action items were identified during the meeting:

1. The NRC staff will complete the meeting summary within 30 working days, including citations for information discussed at the meeting.
2. PRI will review the information discussed during this meeting and inform the NRC staff of its plans to resolve the RAIs discussed during this meeting as well as the remaining health physics related RAIs. PRI may be able to support another meeting on health physics RAIs in February 2018.

There were no questions from members of the public that participated in this public meeting.

The meeting concluded at approximately 11:15 a.m. EST.

Meeting Attendees
Wednesday January 17, 2018
Teleconference
10:00 a.m. to 1:00 p.m.

Topic: Discuss RAIs related to health physics for PRI's Smith Ranch Highland license renewal.

NAME	AFFILIATION
Doug Mandeville	NRC (via telephone)
Dave Brown	NRC
Tony Huffert	NRC
Larry Reimann	PRI (via telephone)
Beth Frye	PRI (via telephone)
Mindy Griffits	PRI (via telephone)
Dan Mudder	PRI (via telephone)
Jim Shriver	PRI (via telephone)
Tammy Dyer	PRI (via telephone)
Sarah Fields	Uranium Watch
Doug Pavlick	PRI (via telephone)

PUBLIC MEETING AGENDA:

Public Meeting with PRI to Discuss RAIs for the SR-HUP
License Renewal Request
January 17, 2018, 10:00 a.m. to 1:00 p.m. EST

Time	**Topic**	**Lead**
10:00 a.m.	Introductions	All
10:05 a.m.	Opening Remarks	PRI
10:10 a.m.	Discussion of PRI's responses	PRI
12:40 p.m.	Remarks from Public	Public
12:55 p.m.	Review of Action Items	NRC
1:00 p.m.	End meeting	All