

December 15, 2006

MEMORANDUM TO: Michael T. Lesar, Chief  
Rules and Directives Branch  
Division of Administrative Services  
Office of Administration

FROM: Scott C. Flanders, Director **/RA/**  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

SUBJECT: NOTICE OF AVAILABILITY OF ENVIRONMENTAL ASSESSMENT AND  
FINDING OF NO SIGNIFICANT IMPACT FOR THE ADDITION OF THE  
REYNOLDS RANCH AREA TO POWER RESOURCES, INC'S SMITH  
RANCH / HIGHLANDS URANIUM PROJECT, CONVERSE COUNTY,  
WYOMING

Enclosed please find one signed original, four copies, and an electronic version on a 3.5-inch diskette of the subject *Federal Register* Notice for transmittal to the Office of the Federal Register for publication.

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Docket No.: 40-8964  
License No.: N/A

Staff Contact: James Park  
Phone No.: (301) 415-5835

Enclosures:

1. One original and four copies
2. One 3.5-inch diskette (electronic version)

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**U.S. NUCLEAR REGULATORY COMMISSION**

**[Docket No. 40-8964]**

**Notice of Availability of Environmental Assessment and Finding of No Significant Impact  
For the Addition of the Reynolds Ranch Area To Power Resources, Inc's Smith Ranch /  
Highlands Uranium Project, Converse County, Wyoming**

**AGENCY:** U.S. Nuclear Regulatory Commission

**ACTION:** Notice of Availability

**FOR FURTHER INFORMATION CONTACT:** James Park, Environmental and Performance Assessment Directorate, Division of Waste Management and Environmental Protection, Office of Federal and State Materials and Environmental Management Programs, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Telephone: (301) 415-5835; Fax number: (301) 415-5397; E-mail: jrp@nrc.gov.

**SUPPLEMENTARY INFORMATION:**

**I. Introduction**

By letter dated January 14, 2005, Power Resources, Inc. (PRI) submitted a request to amend its U.S. Nuclear Regulatory Commission (NRC) Source Material License SUA-1548 for the Smith Ranch-Highland Uranium Project (SR-HUP), located in Converse County, Wyoming. PRI requested that the SR-HUP permit area be modified to include the Reynolds Ranch area, which encompasses approximately 8700 acres (3521 hectares) and is contiguous with the current northern boundary of the SR-HUP permit area. PRI desires to conduct in-situ leach uranium mining in the Reynolds Ranch area. PRI modified its amendment application by letter dated April 7, 2005.

The NRC staff has prepared an Environmental Assessment (EA) in support of its review of PRI's application in accordance with the requirements of 10 CFR Part 51. Based on the EA, the NRC has concluded that a Finding of No Significant Impact (FONSI) is appropriate.

Enclosure

## II. EA Summary

### Background

PRI's SR-HUP is a commercial in-situ leach (ISL) uranium mining facility located in the South Powder River Basin, Converse County, Wyoming. The main office and Central Processing Plant complex is located at Smith Ranch, about 17 air miles (22 road miles) (27 air / 35 road kilometers (km)) northeast of Glenrock, Wyoming, and 23 air miles (25 road miles) (37 air / 40 road km) northwest of Douglas, Wyoming. NRC issued PRI's current NRC license for the SR-HUP (Source Material License SUA-1548) on August 18, 2003, as part of a license renewal process. Commercial ISL uranium production began at the Highland site in January 1988 and at the Smith Ranch site in June 1997.

Under SUA-1548, PRI is authorized, through its ISL process, to produce up to 5.5 million pounds (2.5 million kilograms) per year of tri-uranium octoxide ( $U_3O_8$ ), also known as "yellowcake." PRI's current annual production is less than half of this limit.

### Review Scope

The NRC staff has reviewed PRI's request in accordance with the NRC's environmental protection regulations in 10 CFR Part 51. Those regulations implement section 102(2) of the National Environmental Policy Act of 1969, as amended. The EA provides the results of the NRC staff's environmental review; the NRC staff's radiation safety review of PRI's request will be documented separately in a Safety Evaluation Report.

The NRC staff has prepared the EA in accordance with NRC requirements in 10 CFR Parts 51.21 and 51.30, and with the associated guidance in NRC report NUREG-1748, "Environmental Review Guidance for Licensing Actions Associated with Nuclear Material Safety and Safeguards Programs" (NRC, 2003). In 40 CFR Part 1508.9, the Council on Environmental Quality defines an EA as a concise public document that briefly provides sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a FONSI.

The NRC staff's review addressed the environmental impacts of PRI's currently-approved mining operations at the SR-HUP only insofar as such operations would be modified by the proposed mining at the Reynolds Ranch amendment area.

#### Proposed Action

PRI is proposing to modify its permit area boundary to accommodate the Reynolds Ranch area, and to conduct ISL operations within that area. As part of such operations, PRI would construct eight wellfields and a satellite ion-exchange facility for the recovery of uranium and for wellfield restoration following mining operations, and operate a deep disposal well for the disposal of liquid wastes. The ore deposits in the SR-HUP and Reynolds Ranch amendment area generally occur at depths of 450 feet (137 meters (m)) to 1000 feet (305 m) below the surface in long narrow trends varying from a few hundred to several thousand feet long and 20 to 300 feet (6 to 91 m) wide. The depth depends on the local topography, the dip of the formation, and the stratigraphic horizon. At the Reynolds Ranch amendment area, the shallower ore deposits are contained within the U/S-Sand, with the mineable ore in this sand occurring at approximate depths of 380 to 525 feet (116 to 160 m). Most of the remaining uranium mineralization at the Smith Ranch and Reynolds Ranch areas occurs in the O-Sand formation at depths of 700 to 900 feet (213 to 274 m).

Following uranium recovery in each mining unit, PRI would restore ground-water conditions in the wellfield. Restoration techniques would involve ground-water sweep, clean water injection, and geochemical stabilization of the aquifer with a reductant. The goal of groundwater restoration is to return the aquifer to the baseline conditions that existed prior to the start of uranium recovery; or, if approved, to a secondary standard of pre-mining "class of use."

#### Purpose and Need for the Proposed Action

PRI currently conducts commercial-scale ISL uranium mining at the SR-HUP permit area. PRI is proposing to expand its mining operations and to conduct ISL mining in the Reynolds Ranch amendment area. This would enable PRI to continue to meet the current and future needs of its customers for U<sub>3</sub>O<sub>8</sub> that would be made eventually into fuel for commercially-operated nuclear power reactors.

#### Alternatives to the Proposed Action

##### *No Action Alternative:*

Under the “no action” alternative, PRI would continue to conduct ISL mining operations within the existing boundaries of the SR-HUP, but it would not be authorized to conduct such mining operations in the Reynolds Ranch area.

##### *Other Alternatives:*

In the southern Powder River Basin, where the SR-HUP facility is located, uranium ore has been mined via open pits and underground mining in the past. This activity occurred from 1970 to 1984 at the Exxon Highland facility, which is adjacent to the eastern edge of the SR-HUP permit area, and from the mid-1970s to 1986 at Union Pacific Resources’ Bear Creek site, which is approximately 15 miles (24 km) northeast of the SR-HUP permit area.

The environmental impacts associated with the recovery and processing of uranium ore obtained via open pit or underground mining are generally recognized as being considerably greater than those associated with in-situ leach mining. This is due predominantly to the need to access the uranium ore via open pits several hundred feet deep or via extensive underground mine workings, and to the conventional milling process, which generates a significant amount of waste relative to the amount of ore processed (roughly 95% of the ore is disposed as waste). Extensive mill tailings ponds are needed to dispose of these wastes.

Therefore, although both open pit and underground mining of uranium has occurred near the Reynolds Ranch amendment area, these alternatives were not be considered further in this analysis.

### Environmental Impacts

#### *No-Action Alternative:*

Under the no-action alternative, PRI would not be authorized to conduct ISL mining operations in the Reynolds Ranch area. PRI would continue to conduct such operations within the SR-HUP permit area. The Reynolds Ranch area would remain open to its current uses: livestock grazing and wildlife use.

#### *Proposed Action:*

The major potential environmental impacts associated with ISL uranium recovery are impacts to groundwater quality, air quality, and land use, radiological impacts, and impacts from waste disposal.

ISL operations in the Reynolds Ranch area are not expected to impact local uses of surface or ground water. To the extent possible, PRI will use existing access roads in the area; however, it is expected that PRI will need to construct additional roads for its operations. Ephemeral drainages may be affected by this road construction, as well as by the construction of wells for production and monitoring. PRI would consider and implement erosion measures appropriate for the situation, potentially including crossing drainages at right angles; contouring and re-vegetation to stabilize soils; placement of hay bales; the use of diversion ditches, engineered culverts, and energy dissipaters to control runoff; and limiting travel within the drainage bottoms to necessary well construction and maintenance activities.

With respect to ground water, while it is common to dramatically degrade the water quality within the mineralized zone during uranium recovery activities, this impact is localized

and temporary (*i.e.*, extending over the life of mining operations). Following mining, PRI is required to restore the affected groundwater to its pre-mining quality or if approved, to its pre-mining class-of-use. PRI submits the results of its restoration activities to the NRC and the State of Wyoming Department of Environmental Quality (WDEQ) for final approval, prior to the termination of such activities. To date, the NRC staff has approved groundwater restoration activities at the SR-HUP site in 1987 for the R&D operations and in 2004 for the A-Wellfield during commercial operations.

In addition, PRI's operations in the Reynolds Ranch area are not expected to affect local stock and domestic wells as these wells are completed in stratigraphic horizons above the zones planned for ISL mining. Pre-mining aquifer testing by PRI would ensure that confining layers are present to restrict the vertical movement of ISL leaching solutions and to restrict the influence of pumping in the deeper mining zones on water levels in the stratigraphically higher non-mining aquifers.

The primary source of radiological impact to the environment from site operations is gaseous radon-222, which is released from the satellite facility and from the wellfields. The highest radon-222 concentration estimated was 1.1E-03 working level at a distance of 0.9 mi (1.5 km) ENE of the proposed satellite facility. This concentration is 4% of the 100 mrem/yr effluent concentration limit in 10 CFR Part 20. The total annual effective dose was 27 mrem/yr at the unoccupied Mason House, and 4 mrem/yr at the Reynolds Ranch. Both of these dose values are well below the 10 CFR Part 20 limit of 100 mrem/yr to members of the public. These concentrations and doses are from the mining operations anticipated during year 8 at the Reynolds Ranch area, which is when the highest doses would be expected, since in that year, PRI plans to have four of its anticipated eight wellfields in production and three other wellfields in restoration.



Uranium recovered at Reynolds Ranch would be processed at the Smith Ranch central processing plant (CPP). For final yellowcake processing at the CPP, PRI employs a vacuum dryer that collects in a liquid condenser the dust and gas generated from drying. As a result, no particulates will be released to the environment. The main non-radiologic gaseous effluents that would be released from the operation of processing equipment in the CPP include gases such as CO<sub>2</sub> and hydrogen chloride. At the CPP, these gases are vented directly to the atmosphere where they are readily dispersed.

With respect to land use, the primary impact would be the fencing off of approximately 325 acres (131 ha) of the 8704 acres (3521 ha) to exclude livestock until the completion of groundwater restoration and surface reclamation. These effects, however, would be limited, temporary, and reversible as the land would be returned to its former grazing use following post-recovery surface reclamation.

Air quality would be impacted by the release of diesel emissions from drilling and construction equipment and from fugitive dust from construction activities and vehicle traffic. Diesel emissions would be minor and of short duration, and would be readily dispersed in the atmosphere. Fugitive dust generated from construction and drilling activity, as well as vehicle traffic on unpaved roads, would be localized and of short duration. Localized areas affected by the laying of pipelines and drilling of wells would be reclaimed, topsoiled, and re-seeded.

PRI is required under license condition 9.6 of SUA-1548 to dispose of 11e.(2) byproduct materials generated by project operations at a licensed byproduct waste disposal site. Currently, PRI disposes of its radioactively-contaminated solid wastes at Pathfinder Mine Corp.'s Shirley Basin uranium mill site in eastern Wyoming. PRI will also send liquid wastes from its process down a planned deep disposal well permitted by WDEQ.

## Conclusion

The NRC has reviewed the environmental impacts of the proposed action in accordance with the requirements of 10 CFR Part 51. The NRC staff has determined that the addition of the Reynolds Ranch area to the SR-HUP operational area for the purpose of constructing and operating in-situ leach uranium mining units and supporting infrastructure, would not significantly affect the quality of the human environment. Therefore, an environmental impact statement (EIS) is not warranted for the proposed action, and pursuant to 10 CFR Part 51.31, a FONSI is appropriate.

#### Agencies and Persons Consulted

The NRC staff consulted with other Federal and State agencies regarding the proposed action. These consultations were intended to afford these agencies the opportunity to comment on the proposed action, and to ensure that the requirements of Section 106 of the National Historic Preservation Act (NHPA) and Section 7 of the Endangered Species Act (ESA) were met with respect to the proposed action.

By letter dated April 10, 2006, the NRC staff provided a draft copy of the EA to the Casper, WY field office of the U.S. Bureau of Land Management (USBLM) for its review and comment. By electronic mail on April 24, 2006 and July 5, 2006, the USBLM provided comments on the draft EA. In its comments, the USBLM focused on land use and hydrology issues. The NRC staff revised the EA to address the USBLM's comments.

The NRC staff also consulted with the WDEQ and the Wyoming Department of Transportation (WDOT). By letter dated April 10, 2006, the NRC staff provided a draft copy of the EA to the WDEQ for its review and comment. By phone conversation on August 15, 2006, the WDEQ provided its comments, requesting clarification of the post-mining groundwater restoration standards and of the groundwater transfer restoration process and provided some editorial comments. The NRC staff revised the EA to address the WDEQ's comments. In

response to November 2005 information requests from the NRC staff, the WDOT provided traffic counts and accident data and analyses for the stretch of county road that borders the western boundary of the Reynolds Ranch area.

With respect to the requirements of Section 7 of the ESA, the NRC staff consulted with the U.S. Fish and Wildlife Service, Mountain-Prairie Region (USFWS/MPR). By letter dated September 28, 2005, the USFWS/MPR provided a list of endangered and threatened species, as well as comments on migratory birds and wetlands and associated riparian areas. Based on the NRC staff's review, there are no endangered or threatened species, either plant or animal, nor is there critical habitat, in the Reynolds Ranch area. There is not expected to be an effect on any endangered or threatened species or critical habitat from ISL mining operations in the Reynolds Ranch area.

Pursuant to the requirements of Section 106 of the NHPA, the NRC staff consulted with the Wyoming State Historic Preservation Office (WSHPO). By letter dated August 11, 2005, the NRC staff requested information from the WSHPO regarding cultural and historic properties that may be affected the proposed addition of the Reynolds Ranch area to the SR-HUP operational area. By return letter dated August 24, 2005, the WSHPO provided its concurrence that no historic properties would be adversely affected by the proposed action.

### **III. Finding of No Significant Impact**

On the basis of the EA, the NRC staff has concluded that there are no significant environmental impacts from the addition of the Reynolds Ranch area to the SR-HUP operational area for the purpose of conducting ISL uranium mining. Therefore, the NRC staff has determined not to prepare an EIS.

### **IV. Further Information**

Documents related to this action, including the application for amendment and supporting documentation, will be available electronically at the NRC's Electronic Reading Room at: <http://www.NRC.gov/reading-rm/adams.html>. From this site, you can access the NRC's Agencywide Document Access and Management System (ADAMS), which provides text and image files of NRC's public documents. The ADAMS accession numbers for the documents related to this notice are:

<u>Document Date</u>	<u>Description</u>	<u>ADAMS Accession No.</u>
1/14/2005	PRI's license amendment request	ML050390076
4/7/2005	PRI's response to NRC staff request for additional information	ML51150034
8/11/2005	WSHPO concurrence on NRC staff determination of no adverse affect	ML052200552
4/10/2006	NRC staff's transmittal of pre-decisional draft EA to USBLM and WDEQ	ML060600176 ML060600191
4/24/2006 7/5/2006	USBLM comments on draft EA	ML062580462 ML062610249 ML062610250
9/30/2006	NRC staff final EA for addition of the Reynolds Ranch amendment area	ML062690386

If you do not have access to ADAMS or if there are problems in accessing the documents located in ADAMS, contact the NRC's Public Document Room (PDR) Reference staff at 1-800-397-4209, 301-415-4737, or by email to [pdr@nrc.gov](mailto:pdr@nrc.gov).

These documents may also be viewed electronically on the public computers located at the NRC's PDR, O-1F21, One White Flint North, 11555 Rockville Pike, Rockville, MD 20852.

The PDR reproduction contractor will copy documents for a fee.

Dated at Rockville, Maryland this 15th day of December 2006.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/  
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