

September 8, 2005

Mr. Ken Milmine
Manager-Health, Safety
and Environmental Affairs
Power Resources, Inc.
P.O. Box 1210
Glenrock, Wyoming, 82637

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION - SMITH RANCH-HIGHLAND
URANIUM PROJECT, NRC LICENSE SUA-1548, LICENSE AMENDMENT
REQUEST - ADDITION OF REYNOLDS RANCH AMENDMENT AREA

Dear Mr. Milmine:

By letter dated January 14, 2005, Power Resources, Inc. (PRI) submitted a request to amend License SUA-1548 to accommodate in situ mining activities at the Reynolds Ranch Amendment Area. The request consisted of a four volume submittal containing a revised Volume I (Chapters 1-10) of the existing Smith Ranch-Highland Uranium Project (SR-HUP) License Application along with Volumes II, III, and IV which contained required baseline information specific to the Reynolds Ranch Amendment Area. The U. S. Nuclear Regulatory Commission (NRC) staff has reviewed the documents, using Standard Review Plan for In Situ Leach Uranium Extraction License Applications (NUREG-1569), and finds that it needs additional information in order to complete its review. The information is identified in the enclosure. Please give us your response within 30 days of the date of this letter.

In accordance with 10 CFR Part 2.390 of the NRC's "Rules of Practice for Domestic Licensing Proceedings, and Issuance of Orders," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publically Available Records (PARS) component of the NRC's document system Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

K. Milmine

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If you have any questions concerning this letter, please contact me, either by telephone at 301-415-7612 or by e-mail at pxm2@nrc.gov.

Sincerely,

/RA/

Paul Michalak
Uranium Processing Section
Fuel Cycle Facilities Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Docket No.: 40-8964

Enclosure: Request for Additional Information

K. Milmine

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DISTRIBUTION:
Docket: 40-8964

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NAME	PMichalak		BGarrett		RNelson					
DATE	09/07/05		09/07/05		09/08/05					

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POWER RESOURCES, INC.
REYNOLDS RANCH AMENDMENT
LICENSE SUA-1548
SMITH RANCH-HIGHLAND URANIUM PROJECT
REQUEST FOR ADDITIONAL INFORMATION

SITE CHARACTERIZATION

Comment No. 1. On Plate 1, please define/label the following items:

- The orange dots labeled “GW” (they appear to coincide with some of the existing stock and domestic wells shown on Figure D6.1).
- Exclusion area boundaries and fences.
- Indicate and label the location of the Mason House.

Basis: NUREG-1569 (page 2-2) acceptance criteria states that the application should contain maps that provide the location of exclusion area boundaries, and fences. Acceptance criteria also states (page 2-5) that for maps showing groundwater supply wells, a 2-mile distance from the site boundary is an acceptable area for which land and water use should be collected.

Comment No. 2. On Figure A-2 (Mineral Ownership Map), please correct the following omissions:

- Township and Range designations were omitted.
- Surface owner on T37N, R74W, Section 25 was omitted.

Comment No. 3. For Figure D-1.1 (Appendix D1), it is not clear which land use categories are defined for the Reynolds Ranch Project (or the Smith Ranch - Highland Projects). Please clearly indicate land use on the figure.

Basis: NUREG-1569 (page 2-4) acceptance criteria states that information is presented in detail sufficient to understand the surrounding land uses.

Comment No. 4. Please address the following issues:

- Expand Figure D6-1 and Table D6-2 to include water use within a 2-mile distance from the proposed license amendment boundary.
- Please provide footnotes indicating the definition of abbreviations used in Tables D6-2, and D6-3.

Enclosure

- Please provide a tabular summary for each 22½-degree sector centered on the 16 cardinal compass points for the following items: human residences and nearest site boundary(ies) to residences within a 2-mile distance.
- Provide projected ground and surface water use (including descriptions of methodology and sources used to make projections) within a 2-mile distance from the proposed license amendment boundary. In addition, page 2-4 indicates that water wells (only water for plant operations and sanitary) are present at other PRI Satellite facilities. Please provide well construction specifications (well diameter, depth, and screened interval) and projected water use.

Basis: NUREG-1569 (page 2-5) acceptance criteria states that for maps showing ground water supply wells, a 2-mile distance from the site boundary is an acceptable area for which land and water use should be collected. In addition, projected water use, with descriptions of methodology and sources used to make projections, should be provided for the same 2-mile distance from boundary area.

Comment No. 5. With respect to abandoned drill holes:

- The data base in Appendix D5 does not contain any entries past 1999. Please verify that no additional borings in the proposed amendment area have been advanced and/or abandoned in the years subsequent to 1999.
- Page D5-3 indicates that to the best of PRI's knowledge, all holes drilled prior to 1997 have been properly sealed and surface plugged. Please consider the presence of pre-1997 boreholes when designing and collecting pre-operational hydraulic test data in the proposed amendment area.

Basis: NUREG-1569 (page 2-5) acceptance criteria states that the location of abandoned wells and drill holes including the depth, type of use, condition of closing, plugging procedure used, and date of completion for each well or drill hole with the site area should be provided.

Comment No. 6. Please provide the following population related information:

- Population/demographic information on minority and low-income populations.
- A map of suitable scale, centered on the proposed ISL facility, marked with concentric circles at 1, 2, 3, 4, 5, 10, 20, 30, 40, 50, 60, 70, and 80 km divided into 22½-degree sectors centered on one of the 16 compass points. A table keyed to this map showing separate and cumulative population totals for each sector and annular ring is provided.
- Projections of population, visitor, and food production over the life of the Reynolds Ranch Satellite facility.

Basis: NUREG-1569 (page 2-8) acceptance criteria states that the license application should contain demographic information on minority and low-income populations; a suitably scaled concentric circle map as described above; and projections of population, visitor, and food production for the life of the in situ leach facility.

Comment No. 7. Please provide or revise the text concerning the following missing items:

- Section 2.4.1 (page 2-7) references Appendix D-3, which is not present in Appendix D.
- Addenda D3-1, D3-2, D3-3A, and D3-3B (Section 2.4.2, page 2-7) and Addendum D3-3C (Section 2.4.2, page 2-8) are referenced, but are not present in Appendix D.

Comment No. 8. Wind Rose data presented in Figure 2-3 is over 34 years old. Please substantiate that these data are consistent with recent wind direction and speed trends.

Basis: NUREG-1569 (page 2-11) acceptance criteria states that “data periods should cover a sufficient time period to constrain long-term trends and support atmospheric dispersion modeling.”

Comment No. 9. On Figures D-2 and D-3, please define/label the following items:

- The type of wireline geophysical methods represented by pink and blue logs.
- The definition of the green designations (they appear to coincide with uranium ore bodies).
- Low permeable units located above and below ore bodies.
- Deep well injection zone.

Basis: NUREG-1569 (page 2-18) acceptance criteria states that in local stratigraphic sections, all mineralized horizons, confining units, and other important units such as drinking water aquifers and deep well injection zones are clearly shown.

Comment No. 10. Attachment D6-1 U/S-sand pump test discussion is confusing. The discussion on page D6-A1-2 notes that “the interlying shale aquitard is, in fact, a discontinuous shale parting,” while on page D6-A1-10, it indicated that well 1062 is “completed in the sandstone aquifer above the H-sand aquifer (i.e., U/S sand) aquifer.” Please clarify the stratigraphic location of well 1062 with respect to mineralized and confining stratigraphic units.

Basis: NUREG-1569 (page 2-18) acceptance criteria states that in local stratigraphic sections, all mineralized horizons, confining units, and other important units such as drinking water aquifers and deep well injection zones are clearly shown.

Comment No. 11. Please address the following seismological issues:

- The quality of Figure 2-5 is poor, please provide a clearer version of the figure. Also please provide a definition for the hatched area in Figure 2-5.
- Please note that more recent reference material concerning seismology in Converse County is available (e.g. Case et. al. 2002. *Basic Seismological Characterization for Converse County, Wyoming*).

Basis: NUREG-1569 (page 2-2) acceptance criteria states that all maps previously submitted should be legible. In addition, NUREG-1569 (page 2-18) acceptance criteria states that a description of the regional geologic structure, including folds and faults, and a discussion of the seismicity and the seismic history of the region should be provided.

Comment No. 12. Appendix D-6, Section 1.2, page D6-1 and Section 2.2, page D6-6 indicates that Figure D6-1 contains the locations of baseline water quality sampling (Attachment D6-2); however, the correlation between wells and surface water sampling locations depicted on Figure D6-1 and baseline sample designation is unclear. Please clarify the correlation between map locations and baseline sampling locations.

Basis: NUREG-1569 (page 2-24) acceptance criteria states that baseline water quality should be determined for mineralized and surrounding aquifers. Consequently, identifying the location of the sample is imperative in meeting this criteria.

DESCRIPTION OF PROPOSED FACILITY

Comment No. 13. Please provide a more detailed discussion concerning the ventilation system discussed in Section 4.1.1 and the system shown in Figure 3.11. This discussion should include the size and function of venting from the IX tanks, sump, waste disposal well tanks, and resin transfer tanks.

Basis: NUREG-1569 (page 3-9) acceptance criteria states that all ventilation, filtration, confinement, dust collection, and radiation monitoring equipment are described as to size, type, and location. In addition, NUREG-1569 (page 4-1) acceptance criteria states that the application provides a demonstration that adequate ventilation systems are planned for process buildings to avoid radon gas buildup.

Comment No. 14. Please specify the range of flow rates and pressures that will be monitored by ion exchange circuit instrumentation.

Basis: NUREG-1569 (page 3-9) acceptance criteria states that operating conditions (i.e., flow rates, pressures, etc.) of radioactive materials and those materials with the potential to impact radiological safety, are clearly identified together with the hazards associated with these materials.

EFFLUENT CONTROL SYSTEMS

Comment No. 15. Please identify the disposition of development/pumping test water generated during anticipated Hydraulic Testing of individual mine units.

Basis: NUREG-1569 (page 4-4) states that common liquid effluents, including well development water and pumping test water, are required to be properly controlled (i.e., diversion to surface impoundments, deep well injection, or land application/irrigation).

Comment No. 16. Section 7.5 - Effects of Accidents (pages 7-10 to 7-18) contains a listing of the likely consequences of any failures in process or well field equipment and measures for quickly containing and mitigating the impacts of released materials. Please expand the section to address the following issues concerning plans and procedures for reasonably expected system failures:

- Identification of appropriate plant and corporate personnel to be notified.
- Provisions for issuing radiation work permits for workers to mitigate impacts.

Basis: NUREG-1569 (page 4-8) states that plans and procedures should be provided for addressing contingencies for all reasonably expected system failures including identification of appropriate plant and corporate personnel to be notified and provisions for issuing radiation work permits for workers to mitigate impacts.

OPERATIONS

Comment No. 17. Section 5.1 (pages 5-1 through 5-6) discusses the pre-operational assessment of wellfields. Please revise text to include the following information in your pre-operational assessment of wellfields:

- The relationship between well field operating pressures (projected down-hole injection pressures), the hydrostatic pressure of the fluid column, sustainable well casing pressures, and formation rupture pressures.
- An impact analysis that includes:
 - The ability to control the migration of lixiviant from the production zones to surrounding environs.
 - Ground- and surface-water pathways that might transport extraction solutions offsite in the event of an uncontrolled excursion, surface piping leak, or incomplete restoration.
 - The impact of in situ leach operations on ground-water flow patterns and aquifer levels.
 - The expected post-extraction impact on geochemical properties and water quality.

Basis: NUREG-1569 (pages 3-5 and 3-6) acceptance criteria states that injection pressures with hydrostatic pressure of the fluid column should be demonstrated to be maintained below casing failure pressures and formation fracture pressures, to avoid hydrofracturing the aquifer and promoting leakage into the overlying units. In addition, an analysis of the effects that in situ leach operations are likely to have on surrounding water users should be provided.

Comment No. 18. Sections 9.5.4 (page 9-13) and 9.16 (page 9-25) contain the proposed record keeping and retention procedures for SR-HUP and Reynolds Ranch Satellite. Please provide record keeping and retention procedures and the current locations of these records for the following items important to decommissioning and reclamation:

- As built drawings or photographs of structures, equipment, restricted areas, well fields, and modifications showing the locations of these structures and system through time.
- Drawings of areas of possible inaccessible contamination, including features such as pipes or pipelines.

Basis: NUREG-1569 (page 5-6) acceptance criteria states that records containing information important to decommissioning and reclamation should be permanently maintained and retained until license termination.

Comment No. 19. Sections 9.1 through 9.3 (pages 9-1 to 9-5) provides an adequate description of corporate organization from the Board of Directors through Safety Supervisor. However, since Reynolds Ranch will be a new facility, please discuss the integration between satellite construction and plant management in terms of operation and management of the facility.

Basis: NUREG-1569 (page 5-1) acceptance criteria states that for new facilities, for groups that support the operation and maintenance of the facility, the integration between plant construction and plant management should be detailed.

Comment No. 20. Section 9.6 identifies employee training with respect to the basic principles of radiation safety, health hazards of exposure to uranium, personal hygiene practices for uranium facilities, radiation safety procedures, and responses to emergencies or accidents involving radioactive materials. Please provide more detail concerning how the present radiation safety training program is consistent (or applicable) with Regulatory Guide 8.31, Section 2.5 (Radiation Safety Training), Regulatory Guide 8.13 (Instructions Concerning Prenatal Radiation Exposure, Revision 3), and Regulatory Guide 8.29 (Instructions Concerning Risks for Occupational Radiation Exposure, Revision 1).

Basis: NUREG-1569 (page 5-13) criteria states that a radiation training program is acceptable if it is consistent with Regulatory Guides 8.31 (Section 2.5, 8.13, and 8.29).

Comment No. 21. Section 9.17 (page 9-25) provides a discussion of security measures at SR-HUP; however, planned measures at Reynolds Ranch are not discussed. Please provide a discussion of planned security measures at the Reynolds Ranch satellite facility.

Basis: NUREG-1569 (page 5-14) criteria states that a security program is acceptable if the applicant has acceptable passive controls, such as fencing for well fields, and active controls, such as daily inspections and locks for plant buildings.

Comment No. 22. Section 9.8 (page 9-15) discusses quarterly gamma surveys at specified locations throughout the Satellite buildings and Central Processing Facilities to assure that areas requiring posting as "Radiation Areas" are identified, posted, and monitored to assess external radiation conditions. Please provide more detail (i.e., a summary table and/or map(s)) specifying the locations of these surveys.

Basis: NUREG-1569 (page 5-20) acceptance criteria states that the application should contain one or more drawings that depict the facility layout and the location of monitors for external radiation.

Comment No. 23. Section 9.11 (page 9-19) discusses airborne uranium, radon daughter, and total effective dose equivalent exposure calculations. Please provide calculations and guidance for prenatal and fetal radiation exposure or explain why they have not been included in the application.

Basis: NUREG-1569 (page 5-25) acceptance criteria states that calculations and guidance for prenatal and fetal radiation exposure should be consistent with Regulatory Guide 8.36 "Radiation Dose to the Embryo/Fetus" and Regulatory Guide 8.13 "Instruction Concerning Prenatal Radiation Exposure."

Comment No. 24. Please provide a summary table containing the following information: radiation survey and monitoring equipment by type, specification of the range, sensitivity, calibration methods and frequency, availability, and planned use.

Basis: NUREG-1569 (page 5-31) acceptance criteria states monitoring equipment by type, specification of the range, sensitivity, calibration methods and frequency, availability, and planned use should be adequately described.

Comment No. 25. Section 9.13.4 (page 9-24) discusses surveys for release of potentially contaminated materials and equipment. Please verify that these surveys include the interior surfaces of pipes, drain lines, or duct work.

Basis: NUREG-1569 (page 5-31) acceptance criteria states that the radioactivity of the interior surfaces of pipes, drain lines, or duct work will be determined by making measurements at all traps and other appropriate access points, provided that the contamination at these locations is likely to be representative of contamination on the interior of the pipes, drain lines, or duct work.

Comment No. 26. Section 9.10.1.4 discusses Radon Daughter Monitoring. Please provide more detail (i.e., type of monitoring device, location within Satellite facility, etc.) concerning the monthly radon daughter monitoring at the Reynolds Ranch Satellite facility.

Basis: NUREG-1569 (page 4-1) states that monitors used to assess worker exposures should be placed in locations where maximum concentrations are anticipated and that monitoring systems should be appropriate to the types of effluents generated.

Comment No. 27. Section 5.3.12 discusses Spill Reporting Requirements. Please provide detail concerning appropriate plant and corporate personnel to be notified in the event of a liquid release.

Basis: NUREG-1569 (page 4-8) states that identification of appropriate plant and corporate personnel to be notified in the event of a liquid release due to system failure should be provided.

GROUND-WATER QUALITY RESTORATION, SURFACE RECLAMATION, AND PLANT DECOMMISSIONING

Comment No. 28. With respect to conducting post-reclamation and decommissioning radiological surveys, please provide confirmation that the survey method for verification of soil cleanup will be designed to provide 95-percent (i.e., statistical) confidence that the survey units meet the cleanup guidelines.

Basis: NUREG-1569 (page 6-22) acceptance criteria states that survey method for verification of soil cleanup should be designed to provide 95-percent confidence that the survey units meet the cleanup guidelines.