



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BLVD
ARLINGTON, TEXAS 76011-4511

December 23, 2013

Ms. Arlene Faunce, Radiation Safety Officer
Power Resources, Inc.
P.O. Box 1210
Glenrock, WY 82637

SUBJECT: NRC INSPECTION REPORT 040-08964/13-002

Dear Ms. Faunce:

This refers to the announced, routine inspection conducted September 9 - 12, 2013, at the Smith Ranch uranium recovery facility in Converse County, and the North Butte Satellite Facility in Campbell County, Wyoming. This inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel. The inspection findings were discussed with you at the exit briefing conducted at the conclusion of the onsite inspection. No violations were identified during this inspection and no response to this report is required.

The issuance of this report was initially delayed at the request of NRC management pending a decision on whether to request additional information on your environmental radon monitoring program. A decision was subsequently made that any such request would be through separate correspondence after issuing new NRC radon guidance.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response, should you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, information so that it can be made available to the Public without redaction.

A. Faunce

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Should you have any questions concerning this inspection, please contact Ms. Linda M. Gersey at 817-200-1299 or the undersigned at 817-200-1191.

Sincerely,

/RA/

D. Blair Spitzberg, Ph.D., Chief
Repository and Spent Fuel Safety Branch
Division of Nuclear Materials Safety

Docket: 040-08964

License: SUA-1548

Enclosure:

NRC Inspection Report 040-08964/13-002

cc w/encl: Mr. Carl Anderson, Solid Waste
and Hazardous Division, Wyoming
Department of Environmental Quality
Ms. Nancy Nuttbrock, Land Quality Division
Wyoming Department of Environmental Quality
Mr. Scott W. Ramsay, Radiological Services Supervisor
Wyoming Office of Homeland Security

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B. VonTill, FSME/DWMEP/DURLD

M. Herrera, Fee Coordinator

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket: 040-08964

License: SUA-1548

Report: 040-08964/13-002

Licensee: Power Resources, Inc.

Facility: Smith Ranch In-Situ Recovery and North Butte Satellite Facilities

Location: Converse and Campbell Counties, Wyoming

Dates: September 9-12, 2013

Inspector: Linda M. Gersey, Health Physicist
Repository and Spent Fuel Safety Branch

Accompanied by: Douglas T. Mandeville, Project Manager
Uranium Recovery Licensing Branch
Office of Federal and State Materials and Environmental
Management Programs

Elise Striz, Ph.D., Hydrogeologist
Uranium Recovery Licensing Branch
Office of Federal and State Materials and Environmental
Management Programs

Bill VonTill, Branch Chief
Uranium Recovery Licensing Branch
Office of Federal and State Materials and Environmental
Management Programs

Ashley Waldron, Project Manager
Environmental Review Branch
Office of Federal and State Materials and Environmental
Management Programs

Approved by: D. Blair Spitzberg, Ph.D., Chief
Repository and Spent Fuel Safety Branch
Division of Nuclear Materials Safety

Attachment: Supplemental Inspection Information

Enclosure

EXECUTIVE SUMMARY

Power Resources, Inc. Smith Ranch In-Situ Recovery Facility NRC Inspection Report 040-08964/13-002

This inspection included a review of site status, site tours, management organization and controls, site operations, radiation protection, environmental protection, transportation, radioactive waste management, and emergency preparedness.

Management Organization and Controls

- The organizational structure and staffing levels maintained by the licensee during the inspection period met the requirements specified in the license and were sufficient for the work in progress. (Section 1.2a)
- The licensee's safety and environmental review evaluations were performed in accordance with license requirements. (Section 1.2b)

In-Situ Leach Facilities

- The licensee was conducting in-situ recovery and restoration activities in accordance with license and regulatory requirements. (Section 2.2)
- North Butte Satellite operations were in compliance with license commitments and regulatory requirements. (Section 2.2)

Radiation Protection

- The licensee implemented a radiation protection program that met the requirements of 10 CFR Part 20 and the license. (Section 3.2)
- One violation was closed pertaining to failure to perform work under a Radiation Work Permit. (Section 3.2a)

Effluent Control and Environmental Protection and Maintaining Effluents from Materials Facilities As Low As Reasonably Achievable (ALARA)

- The licensee implemented groundwater and surface water monitoring programs in accordance with the license. (Section 4.2)

Inspection of Transportation Activities and Radioactive Waste Management

- Transportation activities were being conducted in accordance with the U.S. Nuclear Regulatory Commission, the U.S. Department of Transportation, and license conditions. (Section 5.2a)
- Wastewater treatment activities were being conducted in accordance with the applicable regulations and license requirements. (Section 5.2b)

Emergency Preparedness

- The licensee implemented an Emergency Response Program that was consistent with its license conditions and operating procedures. (Section 6.2)

Report Details

Site Status

At the time of the inspection, Power Resources, Inc. was extracting uranium using the in-situ recovery process. Four satellite facilities (Sat-2, Sat-3, SR-1, and SR-2) and one remote satellite facility (North Butte) were in service and supporting 12 operating mine units (MUs). Seven MUs were in active restoration. Uranium processing and drying operations were in progress at the Smith Ranch Central Processing Plant (CPP). Uranium recovery operations were on standby at the Highland CPP and the licensee was completing renovation work at this portion of the facility. The inspectors understand that a decision on when to restart the Highland CPP depends on market conditions.

The licensee was conducting work at its other licensed satellite facilities. In order to initiate operations at the Reynolds Ranch satellite, the licensee was in the process of obtaining approval from the Wyoming Department of Environmental Quality (WDEQ) in anticipation of starting construction at Reynolds Ranch later in 2013 or early 2014. The Gas Hills and Ruth satellites are not in operation at this time, although the licensee inspects these facilities once per quarter.

The licensee had initiated injection of lixiviant in the first wellfield, MU1, at North Butte. The inspectors spent one-day reviewing operations at North Butte and determined that operations were in compliance with the commitments in the license and license application, and with regulatory requirements.

The inspectors toured the North Butte facility and MU1 wellfield, Smith Ranch CPP, Purge Storage Reservoir 2 (PSR-2), selenium treatment plant, MUB, satellite facilities, Highland facility, and header houses on site.

In accordance with License Condition (LC) 9.5, the licensee submitted its annual financial assurance updates for the Ruth satellite on December 11, 2012, and for the Gas Hills satellite on August 5, 2013. These updates have been accepted by the NRC staff and are currently in various stages of the review process. For the Smith Ranch Highland site, the licensee requested, and received approval for a 30-day extension to the deadline for submitting its annual financial assurance update. The licensee submitted the update for Smith Ranch on July 30, 2013; this document has been accepted for review and is currently undergoing a detailed review by the staff. The licensee submitted its most recent annual financial assurance estimate for the North Butte satellite on November 30, 2012. This update was approved by NRC staff in License Amendment 18, which was issued on March 27, 2013.

1 Management Organization and Controls (88005)

1.1 Inspection Scope

Ensure that the licensee had established an organization to administer the technical programs and to perform internal reviews, self-assessments, and audits.

1.2 Observations and Findings

a. Organizational Structure

The licensee's organizational structure is illustrated in Figure 9-1 of the February 2008 license amendment that was approved by the NRC on August 18, 2008. The Smith Ranch operation currently has 153 full-time employees. The North Butte Satellite has 29 full-time employees, including a full-time qualified Health Physics Technician (HPT). The inspectors reviewed the licensee's organizational structure for Smith Ranch and North Butte operations and found that it was in agreement with the license.

At the time of the inspection, the licensee had two vacancies at Smith Ranch operations and four vacancies at the North Butte Satellite. The licensee's Smith Ranch radiation safety staff consisted of one Radiation Safety Officer (RSO), two HPTs, and two HPTs in training. The licensee uses contractors for drilling work and as needed. The inspectors determined that the licensee had sufficient staff to implement the radiation protection, groundwater monitoring, and environmental programs at its current operating level.

b. Safety and Environmental Review Panel

The inspectors reviewed the Operational Review Committee/Safety and Environmental Review Panel (ORC/SERP) 6/13-3, dated July 2, 2013, which evaluated the qualifications for the HPT at North Butte, in accordance with the NRC Regulatory Guide (RG) 8.31. The SERP concluded that the individual met the education, training, and experience requirements of RG 8.31. The inspectors reviewed the SERP and concluded that the licensee had performed the SERP in accordance with the performance based license conditions.

The inspectors reviewed ORC/SERP 8/13-1, which documented the decision and basis not to approve a vacuum pump piping change, as the change would not be consistent with statements made in the approved license application. The inspectors concurred with the licensee's evaluation.

The inspectors reviewed ORC/SERP 6/13-1, which addressed a change in the size of the resin transfer trailers. The SERP review documented the decision to use a 1,000 ft³ resin transfer trailer to transport resins between satellite facilities and the CPP. Staff observed that the license application describes resin transfer trailers with a typical capacity of 500 ft³. Given that the licensee would be able to use existing equipment with the larger transfer trailers and the license application discussed a typical and not absolute size, the inspectors concluded that the determination was in accordance with the performance based license conditions.

The inspectors reviewed ORC/SERP 4/13-2, which addressed the hydrogeologic test package for North Butte MU1. While the inspectors did agree with the SERP decision, the inspectors identified several aspects of this SERP that could be enhanced to aid the inspector's in future hydrogeologic test package reviews. These observations were verbally communicated to the licensee for their consideration. The inspectors concluded that the licensee had implemented the SERP determination in accordance with the performance based license conditions.

On February 20, 2013, the licensee conducted an ORC meeting to discuss a proposed change in the Smith Ranch CPP to include additional elution and precipitation tanks and associated piping. The change would allow the licensee to separate toll-milling product from licensee product. The inspectors observed the new tanks and piping in the CPP and questioned the licensee about the review that was performed to determine if a license amendment was required for the change. The licensee stated that the evaluation was conducted under an ORC, not through the SERP review. Normally, inspectors do not evaluate ORCs because ORC reviews are not intended to determine if a change to licensee operations requires a license amendment. The inspectors reiterated that changes related to operations conducted under the NRC license need to be conducted through the SERP. The inspectors reviewed the ORC documentation and determined that it included all elements of a SERP review and that the review was performed in accordance with license requirements.

c. Audits and Inspections

The inspectors reviewed the audits and inspections being generated by the licensee in accordance with LC 9.7 and RG 8.31. The licensee was conducting and documenting a daily walk-through of all work and storage areas of all facilities to ensure good radiation practices were being followed. The HPTs or a trained plant operator performed the daily walk-through. The RSO, or an HPT when the RSO was not available, was performing a weekly inspection of all facility areas to observe general radiation control practices and review required changes in procedures and equipment. In addition, the RSO was generating a monthly report that summarized the results of the daily and weekly inspections, and monitoring and radiation exposure data. The inspectors found that the audits and inspections met requirements contained in the license.

1.3 Conclusions

The organizational structure and staffing levels maintained by the licensee during the inspection period met the requirements specified in the license and were sufficient for the work in progress. The licensee's safety and environmental review evaluations were performed in accordance with license requirements.

2 In-Situ Leach Facilities (89001)

2.1 Inspection Scope

Determine if in-situ recovery activities were being conducted by the licensee in accordance with the NRC's regulatory requirements and the license.

2.2 Observation and Findings

a. Purge Storage Reservoir (PSR) 2

On previous inspections in 2011 and 2012, the licensee provided the inspectors with three separate reports prepared by a contractor to determine if the wastewater in PSR-2 was leaking into the surrounding groundwater. During the current inspection, the licensee provided three additional reports on this investigation. The reports were, "Summary of Groundwater Monitoring Well Installations at Purge Storage Reservoir 2 (PSR-2)," dated September 2013; "First Quarter Groundwater Monitoring Event at Purge

Storage Reservoir 2 (PSR-2)," dated August 2013; and "Second Quarter Groundwater Monitoring Event at Purge Storage Reservoir 2 (PSR-2)," dated September 2013. The inspectors reviewed the reports on site.

The first report described the installation, development and hydrologic testing of eight new shallow monitoring wells near and around PSR-2 to characterize any seepage and impacts to ground water. The second report described the results from the first quarter sampling of ground water quality and ground water elevation data from the eight new wells and six existing monitoring wells. These wells included upgradient background wells. This data demonstrated the presence of a large ground water mound created by seepage from PSR-2. The data indicate the PSR-2 seepage and associated contaminants are moving into the sediments and ground water surrounding and underlying the pond. The third report presented the second quarter water quality and water elevation data from the same 14 monitoring wells, which further supported these findings.

During the previous inspection, the inspectors asked the licensee to measure the Wyoming (WY) Guideline 8 full suite of constituents at private wells near to PSR-2 to assess if the water quality had been impacted. The licensee provided the inspectors with a full WY Guideline 8 suite of water quality data measured June 30, 2013, at the two private wells, GW-10 and GW-12, which are closest to PSR-2. GW-10 is located 2,000 feet to the south and GW-12 is located about 6,600 feet to the east of the PSR-2. The inspectors requested the completion information for both wells, but the licensee stated no completion reports are available for either well. The licensee was also unable to provide the depths of the wells, as they are currently in use for livestock watering. The inspectors found the current water quality in these wells does not indicate any impacts from the seepage from PSR-2.

The licensee also provided a presentation, which summarized the findings in PSR-2 seepage investigation and an update on the ongoing casing leak investigation in MUs C, E and F. The licensee stated these findings conclude PSR-2 is leaking into surrounding ground water. The update showed there was compelling evidence that the ground water in numerous monitoring wells in two shallow aquifers (140 and 130 sands) in the northern portion of MUC reflected similar water quality to the wastewater in PSR-2. In addition, the ground water elevations and flow direction also supported the conclusion that the elevated chloride and other constituent levels in the shallow aquifers in MUC North were associated with seepage emanating from PSR-2. The licensee asked to be allowed to complete the characterization PSR-2 for two more quarters to be able to fully determine the extent of the seepage. The inspectors, in coordination with the NRC Project Manager, agreed that characterization of the ground water impacts from PSR-2 should continue to inform the corrective action. During the previous inspection, the NRC informed the licensee that they would be required to take timely corrective actions to alleviate impacts from seepage from PSR-2 and to restore the ground water quality in any impacted ground water aquifers. The NRC issued a letter dated, June 17, 2013, (ML13151A104) to inform the licensee of these requirements under 10 CFR Appendix A to Part 40, Criteria 5D and 5F. The licensee and the inspectors discussed possible corrective actions during the inspection.

b. Recovery Operations and Restoration

At the time of this inspection, uranium recovery operations were being performed at Highland MUs F, H, I, J, K, and K-North. Recovery operations were also being conducted at Smith Ranch MUs 2, 3, 9, 10, 15, and 15A. The pumping test for Smith Ranch MU7 had been completed and submitted to WDEQ for approval. The licensee plans to begin production in MU7 in January 2014. Recovery operations were also underway in North Butte MU1. Delineation was underway in Smith Ranch MUs 8, 11, 16, and 17.

Smith Ranch and Highland Mine Units 1, 4, 4A, C, D, D-ext, and E were in restoration. Only one wellfield, MUA, has had its restoration approved by the NRC and WDEQ. The licensee submitted an alternate concentration limit (ACL) amendment application for the MUB restoration in May 2013, which is under review by the NRC. During the inspection, the licensee provided an update on the status of wellfield restoration. Mine Units undergoing ground water sweep and treatment are showing improvement with substantial declines in alkalinity, chloride, conductivity and uranium. Mine Units 1, 4, D and southern portion of MUE are progressing toward initiation of stability monitoring. The licensee is planning for MUs H, I and MU2 to go into restoration next year.

The inspectors conducted a review of the licensee's control of its disposal pathways for plant wastewater. The sources of wastewater include the production bleed stream, plant wash-down water, sump water, laboratory wastes, and reverse osmosis system water. At the CPP, the sources of wastewater also include the yellowcake thickener overflow and filter press wash water.

As described in the license application, the licensee is authorized to dispose of plant and wellfield operations wastewater through land application or by deep disposal well (DDW) injection. The licensee currently has seven DDWs in use at Smith Ranch and Highlands CPPs and one installed at North Butte. The licensee provided the inspectors with the current waste disposal rates for each of the operating DDWs. The range of actual capacity reported by the licensee for the seven wells was 6.4 – 81.6 gallons per minute (gpm) with a total capacity of approximately 210 gpm. Two additional wells, DDWs 7 and 8 are permitted for operation. The licensee stated it is proceeding with the installation of DDW 7, but has been delayed because the well had to be moved approximately 900 feet from its planned location. In addition to the DDWs, the licensee is authorized to dispose of wastewater via land application at the irrigation circle associated with PSR-2. The land application system provides an additional 180 gpm of disposal capacity. The licensee stated it was assessing the use of the existing irrigator at Highland for additional wastewater disposal capacity. The inspectors noted this additional capacity would help the licensee meet restoration wastewater disposal demands. The North Butte DDW is not in use at this time, and all wastewater is routed to the storage ponds.

c. Site Tours

The inspectors conducted site tours to observe in-situ recovery operations in progress. Areas toured included the Smith Ranch CPP, the Highland CPP, the radium/selenium treatment building, MUC, and PSR-2 and associated monitoring wells and land application area. The inspectors also visited MUB. WDEQ approved the restoration of MUB in 2006. Based on WDEQ approval, the licensee began some removal of the wellfield infrastructure including the shutdown of the header houses. The NRC, however, has not yet approved

the MUB restoration. In May 2013, the licensee submitted an ACL amendment application for MUB restoration approval, which is currently under review. In this application, the licensee indicated that some of the wellfield infrastructure had been removed. The inspectors opened header house B-11 and found that piping had been removed. All injection and extraction wells seen by inspectors in MUB were uncovered and therefore out of operation. This inspection confirmed the condition of MUB reported by the licensee, who has stated the wellfield would require substantial refurbishment if additional restoration was required.

The inspectors reviewed the status of plant equipment, radiation protection postings, and site security. Plant parameters were within required operating intervals, plant equipment appeared to be in good condition, radiological postings were in place, and site security was adequate. In summary, the licensee was maintaining control of the areas and equipment in accordance with license and regulatory requirements.

In addition to the areas identified above, the inspectors visited the North Butte remote satellite facilities. At the North Butte remote satellite, the licensee had recently initiated operations in MU1 and was continuing development of this mine unit. The licensee was performing activities in a manner consistent with license requirements.

The inspectors conducted independent radiological surveys of the gamma exposure rates present in the Smith Ranch CPP, satellite facilities, header houses, selenium plant, and the Highland CPP. The surveys were conducted using a Ludlum Model 19 microRoentgen survey meter (NRC 015540, calibrated using Radium-226, calibration due date of 07/18/2014), and a Ludlum Model 2401-EC survey meter (NRC 21176G, calibration due date of 12/28/2013). Gamma exposure rates measured by the inspectors were as expected. Background readings of 40 microRoentgen per hour ($\mu\text{R/hr}$) were found outside the CPP and satellite buildings. The highest gamma exposure reading of 2000 $\mu\text{R/hr}$ was measured in the CPP near a fresh eluent tank (T-40). The inspectors did not identify any areas that had not already been identified and posted as radiation areas by the licensee.

2.3 Conclusions

The licensee was conducting in-situ recovery and restoration activities in accordance with license and regulatory requirements. North Butte Satellite operations were in compliance with license commitments and regulatory requirements.

3 **Radiation Protection (83822)**

3.1 Inspection Scope

Determine whether the licensee's radiation protection program was being conducted in compliance with license and 10 CFR Part 20 requirements.

3.2 Observations and Findings

a. Occupational Exposures

The inspectors reviewed the licensee's dose assessment records from January 2013 through September 2013. Approximately 232 employees and contractors were monitored for external exposures using thermoluminescent dosimeters that were

exchanged on a quarterly basis. Occupationally monitored employees included CPP operators, satellite/restoration operators, health physics staff, and maintenance workers. The highest deep dose equivalent from January to September 2013 was a CPP operator that received 300 millirem (3.0 milliSievert) total during the nine-month period.

The licensee conducted air sampling, in part, for assessment of internal exposures. The inspectors reviewed the licensee's radon-222 air sampling records and the uranium particulate and worker breathing zone sample results for January through September 2013. The highest derived airborne concentration in hours (DAC-hrs) for radon daughters for an employee from January through September 2013 was a laboratory worker that received 29.55 DAC-hrs. The highest employee airborne uranium exposure was 53.45 DAC-hrs, received by a dryer employee. All DAC-hrs results were below the regulatory limit of 2000 DAC-hrs. The inspectors confirmed that the licensee had conducted air sampling at the required intervals.

The licensee collected urine bioassay samples to assess the potential for intakes of uranium. The inspectors reviewed the bioassay program to verify compliance with LCs 11.2 and 11.3. Since the previous inspection, no bioassay results exceeded the action level of 15 micrograms uranium per liter of urine ($\mu\text{g/L}$).

During the previous inspection, one violation was identified by the inspectors related to the failure of the licensee to ensure two contract employees performed work under a Radiation Work Permit (RWP) while working in a contaminated area. Although the two contractors did not exceed any regulatory limit of uranium intake, they did have confirmed positive bioassay results of 22.2 $\mu\text{g/L}$ and 24.7 $\mu\text{g/L}$. This was a violation (VIO 040-08964/1301-01) of LC 9.7, which states, in part, that the licensee shall follow the guidance in RG 8.31. Section 2.2, Operating Procedures, of RG 8.31, states, in part, that for work on non-routine maintenance jobs when the potential for exposure to radioactive material exists and for which no standard written operating procedure already exists, an RWP should be used. The licensee responded to the violation in letter dated August 22, 2013. The licensee committed to instituting a requirement that all work conducted in the former yellowcake drying area of the Highlands CPP would be performed under a RWP. Additionally, the licensee will conduct continuous air sampling during refurbishment work in the Highland CPP and work instructions to contractors in the Highland CPP will be documented and sent to the RSO for review. The licensee also generated a new position of Coordinator, Safety and Contractors, in part to ensure compliance and a consistent approach to contractor safety and management. The inspectors reviewed the corrective actions and found them to have been fully implemented and responsive to the violation. This violation is considered closed.

The licensee also monitors for soluble uranium intake in compliance with Title 10 of the Code of Federal Regulations (CFR) 20.1201(e). The highest soluble intake of uranium from January to September 2013 was received by a contractor and was calculated to be 4.1 milligrams of uranium in one week. This is below the regulatory limit of 10 milligrams per week.

The highest total effective dose equivalent for employees and contractors from January to September 2013 was a CPP employee that received 368 millirem

(3.68 milliSievert) total for the nine-month monitoring period. This is below the annual regulatory limit of 5000 millirem (50 milliSievert).

b. Radiation Protection Surveys

Section 9.8 of the license application requires, in part, that the licensee perform quarterly gamma radiation surveys in specific locations throughout the satellite buildings and CPP areas to verify radiation area postings and to assess external radiation conditions. At the time of the inspection, the inspectors determined that the licensee was conducting the gamma radiation surveys on a weekly frequency in all areas, except the header houses. Various header houses were surveyed on a monthly basis that resulted in each being surveyed at least once during the year. The inspectors reviewed the survey results and found them to meet the requirements of the license.

Alpha contamination surveys were conducted by the licensee on a weekly frequency in clean areas of the site and in the process areas, although Section 9.13 of the license application authorizes the licensee to conduct monthly process area surveys. The inspectors reviewed the survey results and found them to meet the requirements of the license.

c. Training

The licensee is required to conduct training in accordance with LC 9.7 and license application Section 9.6 for its contractors and new employees, and provide annual refresher training for current employees. The inspectors reviewed the radiation safety training records for one new hire and one contractor hired since the previous inspection. The licensee's database that tracks all contractor and employee training showed that 12 new hires were trained and approximately 300 contractors have been trained, since the previous inspection. The inspectors reviewed the training content and written exams and found them to meet the requirements of the license and regulatory requirements. All training activities and records were in accordance with the requirements of the license.

d. Instrumentation

The inspectors reviewed the licensee's operability, calibration, and maintenance records for portable radiation survey instruments. On an annual basis, the licensee sends all portable survey instruments to an outside vendor for calibration. The inspectors reviewed instrument calibration certificates for several portable survey instruments and found the calibration certificates to be adequate and the instruments currently calibrated. The inspectors observed survey meters being used by the licensee's employees when exiting restricted areas. The survey instruments examined by the inspectors were found to be in calibration and were being used appropriately by the licensee's staff.

3.3 Conclusions

The licensee implemented a radiation protection program that met the requirements of 10 CFR Part 20 and the license. One violation was closed pertaining to failure to perform work under a Radiation Work Permit.

4 Effluent Control and Environmental Protection and Maintaining Effluents from Materials Facilities ALARA (87102 and 88045)

4.1 Inspection Scope

Determine if the environmental and effluent monitoring programs are adequate to monitor the impacts of site activities on the local environment.

4.2.1 Observations and Findings

a. Environmental Monitoring

License Condition 12.2 states, in part, that the results of effluent and environmental monitoring shall be reported to the NRC in accordance with the provisions of 10 CFR 40.65. The inspectors reviewed the licensee's Semiannual Effluent and Environmental Monitoring Report for January 1 through June 30, 2013, dated August 30, 2013 (referred to in this report as "semiannual report"). The licensee's environmental monitoring program consisted of air particulate, radon, ambient gamma radiation, groundwater, and surface water. As part of the licensee's wastewater land application permit from the WDEQ, soil and vegetation, irrigation fluid and radium treatment system samples, soil water samples at the irrigation areas, and monitoring wells at PSR-2 are sampled.

Continuous air particulate sampling was conducted at five locations for Smith Ranch-Highland site. These stations monitored conditions at background, downwind of the Smith Ranch CPP restricted area boundary, the nearest downwind resident to the Smith Ranch CPP restricted area, downwind of the Highland CPP restricted area boundary, and downwind resident to the Highlands CPP restricted area. The North Butte satellite also has five monitoring locations: background; the nearest residence to the North Butte Satellite area; north side of the satellite; downwind of the North Butte area; and the south side of the satellite. All air stations were sampled for uranium, radium-226, and lead-210 particulate concentrations. The licensee also elected voluntarily to sample for thorium-230 concentrations in the air. None of the sample results for the first and second quarters of calendar year (CY) 2013 exceeded the respective effluent concentration limit specified in 10 CFR Part 20, Appendix B.

The licensee also sampled for radon-222 concentrations in the air at the ten sample stations (Smith Ranch-Highland and North Butte areas). The inspectors reviewed the radon-222 airborne concentration results for the first and second quarters of CY 2013, all sample results were less than the effluent concentration limit approved in the license application.

b. Wellfield and Excursion Monitoring

License Condition 12.1 requires, in part, that the licensee maintain documentation on spills of source materials, 11e(2) byproduct materials, or process chemicals. The licensee is also required to report any wellfield excursions, spills, or pond leaks involving source materials, 11e.(2) byproduct materials, or process chemicals that may have an impact on the environment.

The inspectors reviewed the spills since the last inspection in the internal report, "Comeco Resources Smith Ranch Highlands Spill Reports-2013". Two reportable spills had taken place since the last inspection. The first spill occurred at MUK, header house (HH) K-6. A fuse joint failed on the injection circuit line feeding the MUK wellfield. The spill totaled 84,924 gallons of which 16,800 gallons were recovered. The second spill was on July 13, 2013, at MUF, HH F-2. A fusion joint failed on the main trunk line releasing 1,048 gallons of production fluid. All releases were evaluated and reported to the NRC as required by LC 12.1. Soil and fluid samples were taken and gamma surveys were done. None of the reported releases exceeded soil or radiation regulatory limits. The inspectors also reviewed the non-reportable spills in the internal report to examine other root causes of and corrective actions for spills. One non-reportable spill was caused by overflow from production well, P119, to the surface in MUK, HH K-6 on January 13, 2013. In this case, a power outage caused the shutdown of several wellfields. As the wellfields were brought on-line in a step-wise fashion, the injection trunk line flowed into the injection wells at HH K-6 before production was started. This injection occurred because the Cla-Valve at HH K-6 had failed to close automatically during the power outage. A wellfield operator saw the spill at P119 and stopped the injection before any other production wells overflowed. In the corrective action recommendation in the report, the operator stated that before wellfield start-up after an outage, the operator must ensure the Cla-Valve is closed. In May 2011, the failure of a Cla-Valve to shut down the injection line during a power outage led to a very large spill when several production wells in MU15 overflowed at the surface when injection wells continued to inject fluid into the mine unit. During the inspection, the inspectors brought this concern to the licensee, noting this is the second time a Cla-Valve failure during a power outage has been implicated in a spill. The licensee stated they would review their start-up procedure for HHs after a power outage to ensure the Cla-valve is closed before they start flow back into the injection lines. The inspectors will review the revised procedure during a future inspection.

License Condition 11.5 requires, in part, that the licensee monitor groundwater at the designated excursion monitoring wells twice a month. The licensee has approximately 1,300 groundwater monitoring wells that are sampled during a typical month using six field sampling personnel. The inspectors reviewed some of the groundwater sampling records and concluded that these records indicated operational groundwater monitoring was being conducted as required by the license.

Three wells are currently on excursion status. One well, KM-007, was placed on excursion status as of March 11, 2013. It is located in the overlying aquifer in MUK. The cause is still unknown and is being evaluated; however, the licensee stated it does not appear to be related to the movement of extraction fluids into the overlying aquifer. The licensee stated it may request a revision of upper control limits for this well. Another well, DM-003, remains on long-term excursion status. According to the licensee, DM-003 is affected by contaminated water in nearby underground mine workings from previous uranium mine operators not associated with this licensee. The licensee indicated it is installing infrastructure to begin to address the cleanup of contaminated water from the nearby mine workings. Another well, CM-032 went on excursion in August 2013. This well has a history of going on excursion. The licensee is pumping nearby wells to control this excursion.

The inspectors determined that the licensee had conducted the requisite monitoring for the excursion monitoring program, identified and taken corrective actions and submitted the required reports within a timely manner pursuant to LC 11.5.

The licensee reported that both the east or west storage ponds have been taken out of operation. The west pond has been relined. Fluid and sediment is being removed from the east pond, so that it may be relined. The inspectors found the operation of the east and west storage ponds continues to be reported in a manner consistent with LC 12.1.

License Condition 10.1.3 requires, in part, that a mechanical integrity test (MIT) be performed prior to an injection or recovery well being brought into service and every 5 years thereafter. The inspectors reviewed the MIT reports for existing and new wells since the last inspection. The licensee reported for Smith Ranch MUs, 1 new well and 22 existing wells had failed a MIT between April and June 30, 2013. For mine units at the Highland site, eight existing wells had failed a MIT within this period. The licensee stated that all new monitoring wells would have an MIT before being put into use. The licensee also confirmed that all wells, which have been used for injection or production, would be evaluated for the cause of the MIT failure. Wells which fail an MIT in MUs C, E, and F are evaluated to see if the failure caused a leak. The licensee also informed the inspectors that all wells which fail MIT in overlying aquifers are now being plugged and abandoned. Workovers to put wells back in service are only being conducted on those wells where the failure lies in the production zone. The inspectors concluded the MITs were being conducted within a timely manner pursuant to LC 10.1.3.

4.3 Conclusions

The licensee implemented the groundwater and surface water monitoring programs in accordance with the license.

5 Inspection of Transportation of Activities and Radioactive Waste Management (86740 and 88035)

5.1 Inspection Scope

Determine if transportation and disposal activities conducted by the licensee were conducted in compliance with regulatory requirements.

5.2 Observations and Findings

a. Inspection of Transportation Activities

The inspectors reviewed the licensee's transportation records maintained since the previous inspection. Trucks with tanker trailers are routinely utilized by the licensee to transport resin to and from the satellite buildings and the CPP. The inspectors reviewed selected resin tanker trailer shipping papers and found them to include the pertinent information required by Department of Transportation (DOT) regulations.

License Condition 9.6 requires, in part, that the licensee possess a waste disposal agreement to dispose of 11e(2) byproduct material at an offsite location. The inspectors reviewed a new waste disposal agreement dated June 10, 2013, and found it to be valid. Material sent for disposal consisted of 11e(2) contaminated equipment, such as filters,

pipes, pumps, and soil. Since the previous inspection, the licensee had 35 shipments of waste to a licensed facility. This is an increase in waste shipments when compared to previous years due to the waste generated from the reconstruction of the Highland CPP. The inspectors reviewed selected shipping records and found them to be complete.

The licensee also ships licensed yellowcake product to ConverDyn for processing. The inspectors noted that the inspection reports since 2011 had stated that the licensee was shipping their yellowcake product to Canada. That was incorrect. The licensee has been shipping yellowcake to ConverDyn since November 2011. Since the previous inspection, the licensee had made a total of 13 yellowcake shipments. The inspectors reviewed a selected sample of shipping records and found them to be complete and in accordance with DOT and NRC regulations.

b. Review of Wastewater Treatment Activities

The license application authorizes the licensee to dispose of wastewater at both the Satellites 1 and 2 land application facilities. Prior to discharge to the purge storage reservoirs, the plant wastewater is processed to remove the excess uranium, radium-226, and selenium concentrations in the water. After treatment, the wastewater is sampled to ensure that it meets the criteria specified in the license application as well as WDEQ requirements for land application.

During 2013, the licensee disposed of wastewater at the Satellite No. 2 land application facility, but not the Satellite No. 1 land application facility. In accordance with Tables 5-8 and 5-9 of the license application, the licensee samples the irrigation fluid monthly at the PSR-2 suction line for the irrigator pivot for natural uranium, radium-226, selenium, and other chemical constituents.

5.3 Conclusions

Transportation activities were being conducted in accordance with the U.S. Nuclear Regulatory Commission, the U.S. Department of Transportation, and license conditions. Wastewater treatment activities were being conducted in accordance with the applicable regulations and license requirements.

6 Emergency Preparedness (88050)

6.1 Inspection Scope

Determine if Emergency Response activities were conducted in accordance with the licensees operating procedures.

6.2 Observations and Findings

The inspectors verified that the licensee's emergency preparedness activities were conducted in accordance with the licensee's Manual II, Safety, Health, and Environmental Quality (SHEQ)-14: Emergency Response Training. The inspectors had discussions with the licensee about training and examined the training records for members of the Basic Emergency Care team, Confined Space Rescue team, Hazardous Material team, and Wild Land Fire team. The local fire department comes out to the site and leads training and drills. The licensee has scheduled an emergency drill during

October 2013. Based on this review it was determined that the licensee has been implementing an Emergency Response program that is consistent with its license conditions and operating procedures.

6.3 Conclusions

The licensee was implementing an Emergency Response Program that is consistent with its license conditions and operating procedures.

7 **Exit Meeting Summary**

The NRC inspectors presented the inspection results to the licensee's representatives at the conclusion of the onsite inspection on September 12, 2013. During the inspection, the licensee did not identify any information reviewed by the NRC inspectors as proprietary that was included in the report.

SUPPLEMENTAL INSPECTION INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

B. Berg, General Manager
K. Garoutte, Safety, Health, and Environment Quality
A. Faunce, Radiation Safety Officer

INSPECTION PROCEDURES USED

IP 88005	Management Organization and Controls
IP 89001	In-Situ Leach Facilities
IP 83822	Radiation Protection
IP 88045	Effluent Control and Environmental Protection
IP 87102	Maintaining Effluents from Materials Facilities ALARA
IP 86740	Inspection of Transportation Activities
IP 88035	Radioactive Waste Management
IP 88050	Emergency Preparedness

ITEMS OPENED, CLOSED, AND DISCUSSED

Open

none

Closed

040-08964/1301-01 VIO Failure to perform work under a Radiation Work Permit

Discussed

None

LIST OF ACRONYMS USED

ACL	alternate concentration limit
ADAMS	Agencywide Documents Access and Management System
ALARA	As Low As Reasonably Achievable
CPP	central processing plant
CFR	<i>Code of Federal Regulations</i>
CY	calendar year
DAC-hrs	derived air concentration hours
DDW	deep disposal well
DOT	U.S. Department of Transportation
gpm	gallons per minute
HH	header house
HPT	health physics technician
IP	NRC Inspection Procedures
LC	License Condition
MIT	mechanical integrity test
MU	mine unit
NRC	U.S. Nuclear Regulatory Commission
µg/l	micrograms per liter
µR/hr	microRoentgens per hour
ORC	Operational Review Committee
PSR	purge storage reservoir
RG	NRC Regulatory Guide
RSO	Radiation Safety Officer
RWP	Radiation Work Permit
SERP	Safety and Environmental Review Panel
SHEQ	Safety, Health, and Environmental Quality
VIO	violation
WDEQ	Wyoming Department of Environmental Quality
WY	Wyoming