



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

September 12, 2018

Michael Griffin, Vice President
Permitting, Regulatory and
Environmental Compliance
Strata Energy, Inc.
2929 New Haven Road
Oshoto, WY 82721
Certificate

SUBJECT: NRC INSPECTION REPORT 040-09091/2018-001 AND NOTICE OF
VIOLATION

Dear Mr. Griffin:

This letter refers to the routine U.S. Nuclear Regulatory Commission's (NRC) inspection conducted onsite from July 17-19, 2018, at your Ross In-Situ Recovery Project in Crook County, Wyoming, with continued in-office review of the public dose assessment and transportation documentation through August 14, 2018. The purpose of the inspection was to determine whether uranium recovery activities were being conducted safely and in conformance with the conditions of your license. A preliminary exit meeting was held with you and your staff on July 19, 2018. The NRC continued to review additional, clarifying information and a final telephonic exit was conducted with you and your staff on August 14, 2018.

The NRC inspection examined activities conducted under your license as they relate to public health and safety, the common defense and security, and to confirm compliance with the Commission's rules and regulations and the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, tours of the uranium recovery facilities and environmental monitoring locations, conduct of independent radiation measurements, and interviews with personnel.

Based on the results of this inspection, the NRC has determined two Severity Level IV violations of NRC requirements occurred. These violations involve your failure to: (1) adequately calculate the quantity of hazardous material by activity for 11.e(2) byproduct material shipments; and (2) adequately assess dose to the public as required by NRC regulations.

These violations were evaluated in accordance with the NRC Enforcement Policy. The current NRC Enforcement Policy is included on the NRC's Web site at (<https://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>). The violations are cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding them are described in detail in the subject inspection report. In accordance with the NRC Enforcement Policy, Section 2.3.2.b., the violations are being cited in the Notice because they were identified by the NRC during the inspection and therefore, do not meet the criteria for a non-cited violation.

The NRC has concluded that information regarding: (1) the reason for the violations; (2) the corrective actions that have been taken and the results achieved; and (3) the date when full compliance was achieved is adequately addressed on the docket by your email dated August 29, 2018, (ML18242A112) for the transportation violation and by the errata to the 2017 Annual Report (ML18253A257) that was submitted to address the representative dose calculation for committed effective dose equivalent (CEDE) to a member of the public in the Central Processing Plant (CPP), a controlled area under the license. Therefore, you are not required to respond to this letter unless the description herein does not accurately reflect your corrective actions or your position. In that case, or if you choose to provide additional information, you should follow the instructions specified in the enclosed Notice.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response, if 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 <https://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy or proprietary, information so that it can be made available to the Public without redaction.

Should you have any questions concerning this matter, please contact Ms. Martha Poston-Brown, Health Physicist, at (817) 200-1181 or the undersigned at (817) 200-1151.

Sincerely,

/RA Troy W. Pruett for/

Janine F. Katanic, PhD, CHP, Chief
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

Docket: 040-09091

License: SUA-1601

Enclosures:

1. Notice of Violation
2. NRC Inspection Report 040-09091/2018-001
w/Attachment: Supplemental Information

cc w/encl:

Guy Cameron, Director, WY Homeland Security
Ryan Schierman, Natural Resources Program Manager, WDEQ
Bjarne Kristiansen, Land Quality District 3, Assistant Supervisor, WDEQ
Mark Rogaczewski, Land Quality District 3, Supervisor, WDEQ

NOTICE OF VIOLATION

Strata Energy, Inc.
Oshoto, Wyoming

Docket No. 040-09091
License No. SUA-1601

During a U.S. Nuclear Regulatory Commission (NRC) inspection conducted onsite July 17-19, 2018, with continued in-office review through August 14, 2018, two violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the violations are listed below:

- A. Title 10 *Code of Federal Regulations* (CFR) Part 71.5(a) requires, in part, that a licensee who transports licensed material outside the site of usage, as specified in the NRC license, or where transport is on public highways, or delivers licensed material to a carrier for transport shall comply with the applicable requirements of the regulations appropriate to the mode of transport of the U.S. Department of Transportation regulations in Title 49 CFR Parts 107, 171 through 180 and 390 through 397.

Title 49 CFR 172.202(a)(5) requires, in part, with exceptions not applicable here, that the shipping description of a Class 7 hazardous material on the shipping paper must include, the total quantity of hazardous materials as indicated by mass, or volume, or by activity.

Contrary to the above, between April 24, 2017, and July 19, 2018, the licensee transported licensed material outside the site of usage, and failed to indicate the total quantity of hazardous materials by mass or volume, or by activity in the shipping description on the shipping papers that accompanied multiple 11.e(2) shipments, which are a Class 7 hazardous material.

This is a Severity Level IV violation (Section 6.8)

- B. Title 10 CFR 20.1302(a) requires, in part, that the licensee shall make or cause to be made, as appropriate, surveys of radiation levels in unrestricted and controlled areas and radioactive materials in effluents released to unrestricted and controlled areas to demonstrate compliance with the dose limits for individual members of the public in 10 CFR 20.1301.

Contrary to the above, on January 31, 2018, the licensee failed to make appropriate surveys of radiation levels in controlled areas to demonstrate compliance with the dose limits for individual members of the public. Specifically, the licensee's dose analysis was not representative of the committed effective dose equivalent (CEDE) received by members of the public in controlled areas of the Central Processing Plant (CPP).

This is a Severity Level IV violation (Section 6.3)

The NRC has concluded that information regarding the reasons for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence, and the date when full compliance was achieved, were adequately addressed on the docket by your email dated August 29, 2018, (ML18242A112) for the transportation violation and by the errata to the 2017 Annual Report (ML18253A257) that was submitted to address the representative dose calculation for CEDE to a member of the public in the CPP, a controlled area under the license.

However, you are required to submit a written statement or explanation pursuant to 10 CFR 2.201 if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to Notice of Violation" and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region IV, 1600 East Lamar Blvd, Arlington, TX 76011-4511, within 30 days of the date of the letter transmitting this Notice of Violation (Notice).

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or in the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <https://www.nrc.gov/reading-rm/adams.html>. Therefore, to the extent possible, your response should not include any personal privacy or proprietary information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must follow the instructions for withholding in 10 CFR 2.390(b)(1).

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this 12th day of September 2018.

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket: 040-09091

License: SUA-1601

Report: 040-09091/2018-001

Licensee: Strata Energy, Inc.

Location Inspected: Ross Project
Cook County, Wyoming

Inspection Dates: July 17-19, 2018

Inspectors: Martha Poston-Brown, Health Physicist
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

Bernadette Baca, Health Physicist
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

Accompanied by: David W. Adams, CHP, Health Physicist
Uranium Recovery Program
Land Quality Division
Wyoming Department of Environmental Quality

Reid Brown, Project Principal
Uranium Recovery Program
Land Quality Division
Wyoming Department of Environmental Quality

Approved by: Janine F. Katanic, PhD, CHP, Chief
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

Attachment: Supplemental Inspection Information

EXECUTIVE SUMMARY

Strata Energy, Inc., In-Situ Recovery Facility NRC Inspection Report 040-09091/2018-001

The U.S. Nuclear Regulatory Commission (NRC) performed a routine health and safety onsite inspection from July 17-19, 2018, with continued in-office review of public dose determination and transportation issues through August 14, 2018. The inspection included observations of site activities, independent radiation surveys, review of records, and interviews with site personnel. In summary, the licensee was conducting operations in accordance with regulatory and license requirements.

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. The licensee's safety and environmental reviews were performed in accordance with the license requirements. Financial assurance and additional protocol documentation was submitted to the appropriate federal agencies for review as required.

The licensee conducted audits and inspections as required by regulatory requirements and the license, with one exception. The inspectors identified a violation associated with the assessment of public dose. The annual dose to members of the public remained below regulatory limits. (Section 1.2)

In-Situ Leach (ISL) Facilities

The licensee conducted in-situ recovery and operations in accordance with the license and regulatory requirements. Radiological controls including signs and postings were implemented in accordance with license and regulatory requirements. (Section 2.2)

Radiation Protection

The licensee implemented a radiation protection program meeting the requirements of Title 10 *Code of Federal Regulations* (CFR) Part 20 and the license. Occupational doses were less than established regulatory limits. (Section 3.2).

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

The licensee conducted environmental monitoring in accordance with license requirements. The licensee reported the results in semi-annual reports to the NRC. The licensee was documenting spills and conducting excursion sampling as specified in the license. The licensee was maintaining wellfield pressures, flow, and mechanical integrity testing within the permit requirements (Section 4.2)

Inspection of Transportation Activities; and Radioactive Waste Processing, Handling, Storage and Transportation

The shipment of yellowcake slurry and the management, storage, transportation, and disposal of 11.e(2) wastes were conducted in accordance with the license and regulatory requirements, with one exception. A violation associated with failure to adequately identify the hazardous material by activity for Class 7 materials being shipped was identified. (Section 5.2)

Ross Project Programmatic Assessment

The licensee was operating under Supplement 5 to the environmental impact statement and the updated programmatic agreement. Cultural resource identification was appropriate and all agreed upon conditions, related to training, markings and postings were in place. (Section 6)

Report Details

Site Status

At the time of the inspection, Strata Energy, Inc. was extracting uranium using the in-situ recovery process. Uranium processing and drying operations are not currently conducted at the Strata facility, rather the uranium loaded resin is shipped to another NRC-licensed facility for conversion of the uranium loaded resins into yellowcake product.

Strata has a total of ten header houses in Mine Units (MU) 1 and 2. MU1 header house 1 (HH-1) through HH-4 were at a reduced flow rate to meet production goals and MU2 HH-5 through HH-9 were in production at full flow. MU2 HH-10 was placed into production at full flow since the last onsite inspection. Strata currently utilizes one surface impoundment (Pond 1) for short-term storage of liquid 11.e(2) byproduct material prior to disposal in a deep disposal well.

1 Management Organization and Controls (Inspection Procedure (IP) 88005)

1.1 Inspection Scope

Ensure the licensee has 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 inspectors reviewed the licensee's organization structure for the Ross Project. At the time of the inspection, the Ross Project facility operation had approximately 37 full-time employees, a decrease of three employees since the last inspection. All management positions were filled with qualified individuals. The Radiation Safety Officer (RSO) is supported by a full-time qualified radiation safety technician (RST).

The radiation safety duties were shared between the RST and the RSO with assistance provided as needed by RSO designees. The inspectors determined the licensee had sufficient staff to implement the radiation protection program, groundwater monitoring and environmental programs at current operating levels.

b. Safety and Environmental Review Panel (SERP)

License Condition 9.4 of the performance based license requires, in part, the licensee establish a SERP process to evaluate if program changes, tests or experiments require an NRC license amendment prior to implementation. The inspectors reviewed the following SERP evaluations completed since the August 2017 inspection:

SERP-17-11 Venting of Process Line in Central Processing Plant (CPP)

SERP-18-01 Approval of Header House 10 (HH-10) for Operation

In accordance with License Condition 9.4, the licensee is expected to submit a description of each change, including a summary of each safety and environmental evaluation to the NRC in a future annual report. The inspectors concluded the licensee correctly implemented the performance-based license, and the evaluations did not require prior NRC approval.

c. Audits and Inspections

License Condition 11.2, Title 10 *Code of Federal Regulations* (CFR) 20.1101(c) and Section 2.3.3 of Regulatory Guide 8.30, "*Health Physics Surveys in Uranium Recovery Facilities*," Revision 1, requires the licensee to conduct annual audits of the radiation safety program. The inspectors reviewed the audits and inspections generated by the licensee since the previous inspection. The RSO, RST and RSO-designees (trained and qualified operators) performed and documented the daily walk-throughs. Site procedures allow trained and qualified operators to perform the daily walk-throughs on days when radiation safety staff were not available, such as weekends and holidays. The RSO or RST reviews the walk-through documentation upon return to the facility. A spot check of the daily walk-throughs conducted since the previous inspection revealed no examples of the RSO or RST failing to perform the required review. If delays in review occurred, the reason for the delay was documented on the form (illness, document misplaced, etc.). The weekly and monthly reviews by the RSO/RST were conducted at the required frequencies.

The licensee conducted an annual radiation safety audit. The inspectors reviewed the annual audit for calendar year 2017. The audit, performed by an outside contractor on January 30-31, 2018, included an evaluation of occupational exposures, radiation survey results, training and compliance with license and regulatory requirements. License Condition 11.2 requires the audit to include a determination of the public dose in accordance with the requirements of 10 CFR 20.1301 and 10 CFR 20.1302. The inspectors reviewed the public dose assessment and identified an issue with the public dose for calendar year 2017. The licensee identified the maximum exposed member of the public as a contractor working in the restricted area, specifically the CPP, for 100 hours per year. However, the licensee utilized the off-site environmental monitoring results for radon and uranium particulate as the basis for determining the committed effective dose equivalent (CEDE) for the member of the public, instead of the more representative data from the CPP. For occupational workers, the CEDE in the CPP represented 94 percent of the dose assigned to workers for the year. As a result, the licensee failed to make appropriate surveys of radiation levels in controlled areas to demonstrate compliance with the dose limits for individual members of the public for calendar year 2017, as required by 10 CFR 20.1302(a). This failure to accurately assess public dose is considered a violation. (VIO-040-09091-2018-001-01).

The inspectors received a copy of the licensee's revised total effective dose equivalent (TEDE) for the maximal exposed member of the public inside the restricted area. In the revision, appropriate corrections were made to the assumptions for determining CEDE for a member of the public, with the submission of an errata to the 2017 Annual Report (ADAMS Accession Number ML18253A257). This revision to the public dose closes the violation.

d. Additional Protocols

The inspectors verified the licensee had provided the NRC with appropriate 2017 documentation to comply with 10 CFR 75.11, which related to the Agreement between the United States of America and the International Atomic Energy Agency for the Application of Safeguards in the U.S. The licensee provided the necessary forms that provide contact information, the capacity of production, the actual annual production, and the quantity of material on hand. The inspectors concluded the reports were accurate, complete, and consistent for the calendar year 2017.

e. Financial Assurance

In accordance with License Condition 9.5, the licensee submitted its most recent annual financial assurance updates for the Strata Energy, Inc. on November 20, 2017 (ADAMS Accession Number ML17345A159) with an update dated May 10, 2018 (ADAMS Accession Number ML18141A432). The NRC review by Headquarters licensing staff is in process.

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 reviews were performed in accordance with the license requirements. Financial assurance and additional protocol documentation was submitted to the appropriate federal agencies for review as required.

The licensee conducted audits and inspections as required by regulatory requirements and the license, with one exception. The inspectors identified a violation associated with the assessment of public dose. The annual dose to members of the public remained below regulatory limits.

2 In-Situ Leach (ISL) Facilities (IP 89001)

2.1 Inspection Scope

Determine if in-situ recovery activities were conducted in accordance with regulatory requirements and the license.

2.2 Observation and Findings

a. Uranium Recovery

The inspectors reviewed records of the lixiviant composition and concluded the results were in compliance with License Condition 10.1 requirements to utilize carbon dioxide gas, sodium carbonate, sodium bicarbonate, dissolved oxygen, or hydrogen peroxide.

The average daily production for the facility, since the previous inspection, was an average of 2,000 gallons per minute (gpm). Since the introduction of MU2 HH-10 flow, the average flow rate was 2,230 gpm. These flow rates were less than the average daily flowrate of 7,500 gpm as stipulated in License Condition 10.2.

b. Site Tours

The inspectors conducted a site tour to observe in-situ uranium recovery activities at the Ross Project CPP. In addition, the inspectors observed swabbing operations in the wellfield and a pond inspection by an operator.

The inspectors observed that all entrance areas to the facility and wellfields were posted with the words, "Any Area Within This Facility May Contain Radioactive Material", as required by License Condition 9.11. Additionally, the temporary storage of byproduct waste materials was located in fenced and locked restricted areas, which were appropriately posted.

The inspectors conducted independent radiological surveys of the gamma exposure rates present in the CPP, header houses and wellfields. The surveys were conducted using a Ludlum Model 19 microrentgen rate meter (NRC No. 016337, Serial Number 36543, calibration due date of October 26, 2018, calibrated to radium-226). The inspectors noted the as-found gamma exposure rates were consistent with the licensee's measurements. The licensee had several areas conservatively posted as radiation areas. The inspectors did not identify any areas which had not already been posted as radiation areas by the licensee. The inspectors determined the licensee identified and posted radiation areas as required by 10 CFR 20.1902.

2.3 Conclusion

The licensee conducted in-situ recovery and operations in accordance with the license and regulatory requirements. Radiological controls including signs and postings were implemented in accordance with license and regulatory requirements.

3 Radiation Protection (IP 83822)

3.1 Inspection Scope

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

3.2 Observations and Findings

a. Occupational Exposures

The inspectors reviewed the licensee's occupational exposure records for calendar year 2017 and the first two quarters of 2018. Occupationally monitored employees included plant and wellfield operators, health physics staff, laboratory staff and maintenance workers. Employees were monitored for external exposure using optically stimulated luminescence dosimeters which were exchanged on a quarterly basis. These results were reported as the deep dose equivalent (DDE). The highest DDE assigned for calendar year 2017 was 9 mrem per year to the RST. The highest DDE assigned for the first two quarters of 2018 was 6 mrem for a CPP operator.

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 results for calendar year 2017 and the first two quarters of 2018. The inspectors confirmed the licensee had conducted air sampling at the required intervals. The appropriate exposures were calculated and recorded for each employee. Bioassay results since the previous inspection were reviewed by the inspectors. No bioassay results were above the lower limit of detection or the action level for investigation (15 micrograms per liter). Spike and blanks were utilized by the licensee as required by radiation protection plan.

Internal dose or CEDE is assigned based on radon monitoring, uranium particulate monitoring and bioassay results. Based on time studies, the licensee differentiates between staff working in or around the CPP and staff working in the wellfield for the assignment of CEDE. Individuals were assigned CEDE based on the following: CPP workers were assigned dose based on 70 percent of their time in the CPP, 10 percent of their time in the wellfield and 20 percent of their time outside. Wellfield workers were assigned dose based on 30 percent in the CPP, 30 percent in the wellfield and 40 percent outside. The highest CEDE assigned to a CPP worker for calendar year 2017 was 154 mrem. The highest CEDE assigned to a wellfield worker for CY2017 was 95 mrem. The highest CEDE for the first two quarters of 2018 was 37.3 mrem for a CPP operator.

CEDE and DDE were combined to report dose as TEDE. The maximum TEDE assigned for a CPP worker for calendar year 2017 was 163 mrem. The maximum TEDE assigned for a wellfield worker for calendar year 2017 was 103 mrem. The maximum dose (TEDE) for the first two quarters of 2018 was 43.3 mrem for a CPP operator. All doses for occupationally exposed workers were below the limits established in 10 CFR 20.1201.

b. Radiation Work Permits

Since the previous inspection, 20 radiation work permits (RWP) were issued and involved the use of respirators; forced ventilation from a fume hood or natural ventilation; and personnel protective equipment, such as gloves, Tyvek suits and rubber boots as the needs of the RWP directed. The inspectors reviewed the permits and found they included the necessary air sampling and protective equipment requirements for the work being performed and RWP actions were consistent with the requirement of License Condition 10.4.

c. Radiation Protection Surveys

The inspectors reviewed the licensee's routine contamination and gamma radiation surveys conducted since the August 2017 inspection. The licensee conducted weekly removable contamination surveys in designated clean areas of the facility such as lunchrooms and office areas. Monthly gamma radiation surveys were conducted in the CPP, wellfield and deep disposal well. Monthly contamination spot checks were conducted on clean trash containers, and respirators. Quarterly spot checks for contamination were conducted on workers, vehicles and equipment in the wellfield. The inspectors reviewed the free release surveys performed by the licensee at the Ross Project site, since the previous inspection, and concluded the surveys were performed in accordance with License Condition 9.6 and Regulatory Guide 8.30, "*Health Physics Surveys in Uranium Recovery Facilities*," Revision 1. The inspectors verified that surveys were being conducted and documented as required. Based on the surveys

reviewed, the inspectors determined there were no contamination issues or unposted radiation areas.

d. Radiation Safety Instrumentation

The inspectors reviewed the licensee's operability, calibration and maintenance records for survey instruments. Instruments reviewed were found to be in calibration. The licensee uses an offsite vendor to perform annual calibration for radiation safety instrumentation. The inspectors observed survey meters used by licensee personnel when exiting restricted areas. The survey meters examined by the inspectors were found to be in calibration and were used appropriately by licensee's staff.

e. Respiratory Protection

The inspectors reviewed the licensee's respiratory protection procedures, medical testing, fit testing results, and training. The inspectors determined the licensee's respiratory protection program met the license and regulatory requirements.

f. Training

The inspectors reviewed the licensee's training records regarding employee radiation worker initial and refresher training, Department of Transportation hazardous materials handling and function specific training, and RSO refresher training. The inspectors determined that the licensee's program met license and regulatory requirements.

3.3 Conclusions

The licensee implemented a radiation protection program meeting the requirements of 10 CFR Part 20 and the license. Occupational doses were less than established regulatory limits.

4 Effluent Control and Environmental Protection (IP 88045) and Maintaining Effluents from Materials Facilities As Low As Is Reasonably Achievable (ALARA) (IP 87102)

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 Observations and Findings

a. Environmental Monitoring

The semi-annual reports were submitted timely by the licensee in accordance with the requirements of 10 CFR 40.65. Submissions were initially reviewed and evaluated by the NRC Headquarters licensing staff. NRC Headquarters licensing staff review these documents and the resulting determination and/or questions regarding the reports are sent to the licensee under separate correspondence. The inspectors reviewed the semi-annual reports and compared the licensee's procedures, practices, and environmental results to verify information in the reports was complete and accurate. The inspectors

observed particulate air, radon, and direct radiation monitoring stations as well as selected surface, domestic, and livestock water and sediment sampling locations.

b. Wellfield and Excursion Monitoring

License Condition 10.14 requires the licensee to maintain injection manifold pressures less than the maximum operating pressure as specified in Section 3.1.4 of the approved license application. The maximum permitted injection pressure for the Ross Project is 140 pounds per square inch (psi). The inspectors reviewed the recorded daily injection pressures since the previous inspection and there were three instances of the daily injection pressure exceeding 140 psi: HH-5 on March 5, 2018; HH-7 on March 15, 2018, and HH-8 on June 24, 2018. In all three occurrences, the exceedances were a result of power losses at the header houses. The loss of power caused the pressure to build up in the system, which resulted in instantaneous pressure spikes, lasting a few seconds, as the system re-stabilized. The pressure spikes did not adversely affect the system.

License Condition 11.5 requires the licensee to monitor groundwater at the designated monitoring wells twice a month for excursion indicators. If two or more indicators are above their respective Upper Control Limit (UCL) or any one indicator is more than 20 percent of its UCL, the well will be resampled and the parameters verified. If by the third sample, the indicators exceed the respective UCLs, the well will be placed in excursion status and sampled at least once every seven days until the well is no longer in excursion status. The inspectors reviewed data collected under the licensee's excursion monitoring program since the last inspection. The licensee implemented the excursion monitoring program in accordance with the established program and no wells were determined to have been on excursion status since the previous inspection.

License Condition 11.6 requires the licensee to maintain documentation of source or byproduct material or process chemical spills and to provide reporting to the NRC spills which are reported to the State of Wyoming or other federal agency. During the inspection period, the licensee had no spills greater than 420 gallons nor any spills that entered a waterway which needed to be reported to the State of Wyoming, other federal agency, or to the NRC. The licensee maintained a log and spill information as part of their decommissioning records.

In Section 3.1.4 of the License Application (referenced in License Condition 9.2), the licensee committed to maintain a production bleed between 0.50 – 2.0 percent with an average of 1.25 percent. Since the previous inspection, the monthly average daily bleed was 0.58 percent for MU1 and 0.78 percent for MU2, which is within the license application requirement of 0.5 to 2.0 percent.

During the majority of the fourth quarter of 2017, as reported in the 4th Quarter 2017 Wyoming Department of Environmental Quality - Land Quality Division (WDEQ-LQD) report, MU2 had a negative total daily bleed in gallons (more fluid was being injected than recovered) when calculated at the header house. The overall percent bleed remained positive (more fluid recovered than injected) over the same time because the percent bleed calculations reported in the quarterly reports were calculated based on flows through the CPP and not based on calculations made at the header houses.

The inspectors also reviewed the licensee's mechanical integrity testing as required by WDEQ-LQD Permit No. 802 and License Condition 10.5, since the last inspection.

Over the 3rd and 4th quarters of 2017 and the 1st and 2nd quarters of 2018, the licensee tested approximately 133 wells with four wells needing to be retested. Two of the four wells retested failed and were subsequently repaired.

4.3 Conclusions

The licensee conducted environmental monitoring in accordance with license requirements. The licensee reported the results in semi-annual reports to the NRC. The licensee was documenting spills and conducting excursion sampling as specified in the license. The licensee was maintaining wellfield pressures, flow, and mechanical integrity testing within the permit requirements.

5 Inspection of Transportation Activities (IP 86740) and Radioactive Waste Processing, Handling, Storage, and Transportation (IP 88035)

5.1 Inspection Scope

Determine if storage and disposal activities were conducted in compliance with regulatory and license requirements.

5.2 Observations and Findings

a. Inspection of Transportation Activities

The inspectors reviewed transportation activities since the last inspection. During this time period, the licensee made yellowcake resin shipments and 11.e(2) byproduct waste shipments. The inspectors reviewed the licensee's procedures and shipping records associated with these shipments. During the review of the shipping records, the inspectors identified an issue with the 11.e(2) byproduct waste shipments. The inspectors noted the total activity on the shipping papers for the 11.e(2) byproduct wastes was not comparable to the gamma radiation dose rate measurements the inspector observed in the plant and the documented dose rate measurements on the shipping papers.

The licensee performed a waste stream analysis on August 3, 2016, and continued to use this waste stream analysis for all subsequent shipments. The inspectors identified the gamma dose rate measurements for the shipments, starting with Shipment 17-005 on April 24, 2017, were double the previous shipments' radiation dose measurements. For example, prior to Shipment 17-005, an average highest surface gamma dose rate measurement was 0.04 milliroentgens per hour and Shipment 17-005 had a highest surface gamma dose rate measurement of 0.1 milliroentgens per hour. Shipment 17-005 contained mostly filter media. A review of similar, predominately filter media shipments, made after Shipment 17-005, revealed higher gamma dose rate measurements consistent with Shipment 17-005. The consistency of higher surface gamma dose rate measurements provided an indication there was an change in the filter media activity. The inspectors concluded the shipments, containing predominantly filter media made from April 24, 2017, to July 19, 2018, did not reflect the initial waste stream analysis, i.e. did not represent the current operational status of the facility. By failing to analyze and represent the current operation status (activity) of the filter media, the licensee underestimated the total activity for the Class 7 material in shipments conducted between April 24, 2017, to July 19, 2018.

In addition, the licensee did not account for CPP sump sediments in shipment activities for shipment 17-007 and 18-023, which were shipped May 10, 2017, and March 29, 2018, respectively. The licensee cleaned out the CPP sumps on a seasonal basis and placed the dried material constituents into 5 gallon buckets, that were placed into the 11.e(2) waste bins. The licensee analyzed the material as part of the waste characterization for disposal and the results included the following: lead-210 at 1,350 picocuries per gram (pCi/g); radium-226 at 483 pCi/g; and natural uranium at 1,660 pCi/g. The inspector determined, for the approximate 5 – 10 gallons (1-2 cubic feet) of material placed into the bin for each shipment, an estimated sediment activity of 0.22 millicuries was not accounted for in the total shipment activity.

The U.S. Department of Transportation regulations under Title 49 CFR 172.202(a)(5) requires, in part, that the total quantity of hazardous materials covered by the description must be indicated by mass or volume, or by activity for Class 7 materials on the shipping papers. The failure to report an accurate total activity on shipping papers for shipments conducted between April 24, 2017 to July 19, 2018 is considered a violation. (VIO-040-0901-2018-001-02).

While the inspectors were onsite, the licensee collected samples of filter media used in the lixiviant circuit and submitted them to a laboratory for radiological analysis, including radium-226. The licensee stated that they plan to use the results to calculate the radiological content of future shipments of byproduct material. In addition, the licensee took several measurements on filter media and submitted the information to the inspectors for additional consideration. In an email dated August 29, 2018, (ML18242A112) the licensee completed or committed to following corrective actions. The licensee is collecting gamma dose rates for each type of filter media when it is removed from service, before placing in waste containers. This data will be used to determine the average gamma dose rate range for each type of filter media. Surveys above the established ranges will result in updated laboratory analysis to calculate a revised waste stream for the radiological content. The licensee also committed to gamma survey spot checks on filter media bags before placement in shipping containers against the established ranges and perform sampling and analysis for results outside the range. The licensee anticipates having the established ranges in place by September 30, 2018. In addition, the licensee resampled the CPP sump sediments to verify the activity of the material before including it in a shipment. Based on the corrective actions taken and planned, this violation is closed.

b. Inspection of Byproduct Waste Storage

The inspectors observed all 11.e(2) byproduct material waste storage bins were staged within restricted areas with surrounding fences and locked entries. The inspectors performed an ambient gamma radiation survey of the CPP containers and confirmed the area was appropriately posted and controlled in accordance with 10 CFR Part 20 regulations.

License Condition 9.9 requires the licensee to dispose of 11.e(2) byproduct material at a site licensed by the NRC or an NRC Agreement State, and to make notification to the NRC if an agreement expires or is terminated. The NRC staff reviewed the licensee's agreement for off-site disposal of solid 11.e(2) byproduct material and determined the agreement met the license condition requirements.

c. Wastewater Treatment Activities

The licensee processed liquid effluent through either, reverse osmosis units, stored in storage tanks, evaporation ponds, or disposed to a deep disposal well.

The three storage ponds were inspected on a walking tour and an employee was observed performing the daily visual inspection of the liners and leak checks. Over the inspection period, the freeboard was maintained at a range of 9-14 feet, well below the 3 foot minimum required by License Condition 10.8(A). No leaks in the liners were detected.

The inspectors reviewed the licensed activities associated with a selected deep disposal well and reviewed records to determine if the licensee was processing and disposing of wastes through the deep disposal wells in accordance with regulatory and license commitments.

The licensee operates one deep disposal well. The inspectors reviewed the WDEQ Class I Well quarterly reports for the 3rd and 4th quarters of 2017 and the 1st and 2nd quarters of 2018. The reports tracked average flowrate, average pressure and maximum pressure. The reports also identified any exceedances of flowrate and pressure limit values. The licensee made a modification to the Class I well in October 2017. The licensee installed a new high pressure pump and stainless steel piping to increase the pressure and flow rate of the Class I well. The piping is rated to 3,000 psi and the high and high-high pressure alarms were adjusted as a result of the modification.

The following are the approximate average disposal flowrates and maximum pressures identified:

<u>Disposal Well No. 2</u>	2017		2018	
	<u>3rd Qtr</u>	<u>4th Qtr</u>	<u>1st Qtr</u>	<u>2nd Qtr</u>
Avg. Flowrate (gpm)	15.3	27.3	30	27.3
Maximum Flowrate (gpm)	100	51	50	137
Limiting Flowrate (gpm)	100	100	100	100
Avg. Injection Pressure (psig)	248	615	884	933
Maximum Pressure (psi)	278	914	990	1034
Limiting Pressure (psi)	1600	1600	1600	1600
High-High Pressure Alarm (psi)	275	1550	1550	1550

gpm = gallons per minute, psi = pounds per square inch

In the 3rd quarter 2017 and 2nd quarter of 2018, the deep disposal well lost power in the months of September and May. When the power was restored and the flow rate meter rebooted, an instantaneous spike of 100 gpm and 137 gpm, respectively, were recorded. The flow rate meter then reset and stabilized to the nominal flow rate of 53 gpm in both instances. The flow rate spikes did not adversely affect the system.

5.3 Conclusions

The shipment of yellowcake slurry and the management, storage, transportation, and disposal of 11.e(2) wastes were conducted in accordance with the license and regulatory requirements, with one exception. A violation associated with failure to adequately identify the hazardous material by activity for Class 7 materials being shipped was identified.

6. **Ross Project Programmatic Agreement**

The Ross Project environmental review conducted by the NRC resulted in Supplemental Environmental Impact Statement, NUREG-1910, Supplement 5. However, identification of the cultural resources was not sufficiently complete to allow inclusion in the Supplemental Environmental Impact Statement. The licensee operated under a programmatic agreement (ADAMS Accession Number ML14111A346) in License Condition 9.8. To complete the requirements of Section 106 of the National Historic Preservation Act, the NRC updated the programmatic agreement with Appendices C (ADAMS Accession Number ML18135A096) and D (ADAMS Accession Number ML18135A100) to the original agreement.

During tours of the facility, the inspectors observed neutral colored wellhead coverings, planting of native vegetation, demarcation of traditional cultural properties. In addition, the inspectors confirmed the placement of an interpretive sign at the entrance to the Ross Project entrance and reviewed the inclusion of the Little Missouri Headwaters Cultural Heritage Project website link (<http://stratawyo.com/little-missouri-headwaters-cultural-heritage-project>) as part of the Minimization and Mitigation Plan in Appendix D of the programmatic agreement.

The licensee was operating under the Supplement 5 to the environmental impact statement and the updated programmatic agreement. Cultural resource identification was appropriate and all agreed upon conditions, related to training, markings, and postings were in place.

7. **Exit Meeting Summary**

The NRC inspectors presented the preliminary inspection findings to the licensee's representatives at the conclusion of the onsite inspection on July 19, 2018. Additional in-office review regarding transportation and public dose issues was conducted through August 14, 2018. During the inspection, the licensee did not identify any information reviewed by the NRC as proprietary which was included in this report. A final exit meeting was conducted telephonically on August 14, 2018.

SUPPLEMENTAL INSPECTION INFORMATION

Partial List Of Persons Contacted

Licensee Personnel

R. Knode, Chief Executive Officer
M. Griffin, Vice President, Permitting, Regulatory and Environmental Compliance
R. Pond, Manager, Health Safety and Environmental, RSO
C. Harless, RST
J. Douhit, Vice President, Operations
J. Durand, Production Superintendent
T. McReynolds, Rig Operator

Inspection Procedures (IP) Used

IP 83822 Radiation Protection
IP 86740 Inspection of Transportation Activities
IP 87102 Maintaining Effluents from Materials Facilities As Low As Is Reasonably Achievable (ALARA)
IP 88005 Management Organization and Controls
IP 88045 Effluent Control and Environmental Protection
IP 88035 Radioactive Waste Processing, Handling, Storage, and Transportation
IP 89001 In-Situ Leach (ISL) Facilities

Items Opened, Closed and Discussed

Opened

VIO-040-09091-2018-001-01 Failure provide an accurate dose to the maximally exposed individual member of the public in accordance with 10 CFR 20.1302(a).

VIO-040-09091-2018-001-02 Failure to adequately determine shipment activities on transportation shipping papers as required by 10 CFR 71.5(a) and 49 CFR 172.202(a)(5).

Closed

VIO-040-09091-2018-001-01 Failure to submit accurate dose to the maximally exposed individual member of the public in accordance with 10 CFR 20.1302(a).

VIO-040-09091-2018-001-02 Failure to adequately determine shipment activities on transportation shipping papers as required by 10 CFR 71.5(a) and 49 CFR 172.202(a)(5).

Discussed

None

List of Acronyms

ADAMS	Agencywide Documents Access and Management System
ALARA	As Low As is Reasonably Achievable
CEDE	Committed Effective Dose Equivalent
CFR	<i>Code of Federal Regulations</i>
CPP	Central Processing Plant
DDE	Deep Dose Equivalent
HH	header house
gpm	gallons per minute
IP	Inspection Procedure
ISL	In-Situ Leach
LQG	Land Quality Division
mrem/hr	millirem per hour
MU	Mine Unit
NRC	U.S. Nuclear Regulatory Commission
pCi	picocurie
psi	pound per square inch
pCi/g	picocuries per gram
RSO	Radiation Safety Officer
RST	Radiation Safety Technician
SERP	Safety and Environmental Review Panel
TEDE	Total Effective Dose Equivalent
UCL	Upper Control Limit
VIO	Violation
WDEQ	Wyoming Department of Environmental Quality

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