



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 E. LAMAR BLVD
ARLINGTON TX 76011-4511

August 26, 2016

Mr. Greg Kruse, Manager
U.S. Operations
Uranium One USA, Inc.
907 Poplar Street, Suite 260
Casper, WY 82601

SUBJECT: NRC INSPECTION REPORT 040-08502/16-001 AND NOTICE OF VIOLATION

Dear Mr. Kruse:

This letter refers to the routine, announced U.S. Nuclear Regulatory Commission (NRC) inspection conducted from July 26-28, 2016, at your Willow Creek Project in Johnson and Campbell Counties, 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, representative records, observations of activities, and interviews with personnel.

The purpose of the inspection was to determine whether site activities were being conducted safely and in accordance with NRC requirements. The inspection findings were discussed with you and members of your staff at the exit briefing conducted at the conclusion of the onsite inspection. The enclosed report presents the results of this inspection.

Based on the results of this inspection, the NRC has determined that one Severity Level IV violation of NRC requirements occurred. The violation involved your failure to maintain a bleed (continuous pumping of groundwater) in each individual wellfield as required by the license. The violation was evaluated in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's Web site at <http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>. The violation is cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding it are described in detail in the subject inspection report. The violation is being cited in the Notice because the NRC identified the violation and no corrective actions to prevent recurrence have been presented to the NRC staff.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. If you have additional information that you believe the NRC should consider, you may provide it in your response to the Notice. The NRC's review of your response to the Notice will also determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS) accessible from the NRC's Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the

G. Kruse

- 2 -

extent possible, your response should not include any personal, privacy, proprietary, or safeguards information so that it can be made available to the public without redaction.

Should you have any questions concerning this inspection, please contact Dr. Robert Evans at 817-200-1234 or the undersigned at 817-200-1197.

Sincerely,

/RA by LEBrookhart Acting for/

Jack E. Whitten, Chief
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

Docket: 040-08502

License: SUA-1341

Enclosures:

1. Notice of Violation
2. NRC Inspection Report 040-08502/16-001

cc w/enclosures:

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**U.S. NUCLEAR REGULATORY COMMISSION
Region IV**

Docket: 040-08502

License: SUA-1341

Report: 040-08502/16-001

Licensee: Uranium One USA, Inc.

Facility: Willow Creek Project

Location: Johnson and Campbell Counties, Wyoming

Dates: July 26-28, 2016

Inspector: Robert Evans, PhD, Senior Health Physicist
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

Accompanied by: Ron Linton, Senior Groundwater Hydrologist
Uranium Recovery Licensing Branch
Division of Decommissioning, Uranium Recovery and
Waste Programs
Office of Nuclear Material Safety and Safeguards

Approved by: Jack E. Whitten, Chief
Fuel Cycle and Decommissioning Branch
Division of Nuclear Material Safety

Attachment: Supplemental Inspection Information

NOTICE OF VIOLATION

Uranium One USA, Inc.
Casper, Wyoming

Docket No. 040-08502
License No. SUA-1341

During an NRC inspection conducted on July 26-28, 2016, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

Title 10 CFR 40.41 requires, in part, that each person licensed by the Commission pursuant to the regulations in this part shall confine his possession and use of source or byproduct material to the locations and purposes authorized in the license. License SUA-1341, Condition 10.1, states that the licensee shall maintain an inward hydraulic gradient by maintaining a bleed in each individual wellfield starting when lixiviant is first injected into the production zone and continuing until the groundwater restoration stability monitoring has begun.

Contrary to the above, between mid-June 2015 and July 28, 2016, the licensee failed to maintain a bleed in Wellfield 5-2. The licensee was required by the license to maintain a bleed on Wellfield 5-2 because the groundwater restoration stability monitoring phase had not begun in this wellfield.

This is a Severity Level IV violation (Section 6.3).

Pursuant to the provisions of 10 CFR 2.201, Uranium One USA, Inc. is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, Region IV, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken; and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued requiring information as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time. If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

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 <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards 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 specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g.,

explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

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

Dated this 26th day of August 2016

EXECUTIVE SUMMARY

Uranium One, USA, Inc.
NRC Inspection Report 040-08502/16-001

This U.S. Nuclear Regulatory Commission (NRC) inspection was a routine, announced inspection of licensed activities being conducted at the Willow Creek in-situ uranium recovery facility in Johnson and Campbell Counties, Wyoming. In summary, the licensee was conducting site activities in accordance with procedures, license requirements, and regulations with one exception as described below.

Management Organization and Controls

- The organizational structure and staffing maintained by the licensee during the inspection period met the requirements specified in the license and were sufficient for the work in progress. (Section 1.2.a)
- Audit and program reviews were conducted in accordance with license and regulatory requirements. (Section 1.2.b)
- The licensee's safety and environmental review evaluations were performed in accordance with license requirements. (Section 1.2.c)
- The licensee prepared and submitted the Additional Protocol notifications as required by regulations. (Section 1.2.d)
- The NRC reviewed the status of a previously-identified Unresolved Item related to incidental wellfield boundary revisions, but the Unresolved Item remained open pending an NRC legal review. (Section 1.2.e)

In-Situ Leach Facilities

- The licensee was operating the facility as required by procedure, license, and regulatory requirements, with one exception. The licensee's failure to maintain a bleed in one wellfield was identified as a violation of the license. (Section 2.2.a and 2.2.b)
- The licensee established and maintained procedures with one minor exception. The licensee's evaporation pond underdrain sampling instructions were inconsistent with the method used by licensee staff to actually measure the underdrains. The licensee's use of photographs in procedures was viewed as a management strength. The licensee continued to perform procedure reviews in accordance with license requirements. (Section 2.2.c)
- The inspector conducted site tours and confirmed that the radiologically restricted areas were properly posted and access control was maintained with gates, fences, and locked doors. (Section 2.2.d)
- A confirmatory survey was conducted by the NRC's contractor during the inspection. The survey included two structures and the surfaces of former Irigaray Mine Units 1-9.

The results of the survey will be presented to the licensee at a later date under separate correspondence. (Section 2.2.e)

Radiation Protection

- The licensee implemented a radiation protection program that met the requirements of 10 CFR Part 20 and the license. During 2015-2016, annual doses to employees were well below the regulatory limits. The licensee's occupational air sampling and radiation work permit programs were in compliance with license requirements. (Section 3.2)

Radioactive Waste Management and Transportation Activities

- The licensee's records indicate that it transported radioactive material in accordance with U.S. Department of Transportation requirements. (Section 4.2.a)
- The licensee continues to maintain a waste disposal agreement as required by the license. (Section 4.2.b)

Effluent Control and Environmental Protection

- The licensee submitted semi-annual reports to the NRC in accordance with license and regulatory requirements. The inspector confirmed that public doses during 2015 were less than the regulatory limit. (Section 5.2)

Report Details

Site Status

At the time of the inspection, Uranium One USA, Inc. (the licensee) was producing uranium at its Willow Creek Project using the in-situ uranium recovery process. At the Irigaray central processing plant (CPP), the licensee was producing uranium yellowcake product from uranium-loaded resins. The licensee was receiving resins from the Christensen Ranch satellite plant and a second NRC-licensed uranium recovery facility. The licensee processed the resins by eluting, precipitating, drying, packaging, and shipping the resultant uranium yellowcake product.

The licensee previously completed groundwater restoration and surface decommissioning at the former Irigaray Mine Units 1-9. During the onsite inspection, Oak Ridge Associated University (ORAU) staff were conducting a confirmatory survey of the surface areas of the former mine units. The ORAU staff also confirmatory surveyed two metal structures previously used to support mining operations.

At the Christensen Ranch satellite plant, the licensee was conducting uranium recovery operations, although at a reduced capacity. The licensee was recovering uranium from Mine Unit 8. The licensee was transferring uranium-loaded resins to the Irigaray CPP for processing about once a week. The licensee also maintained a groundwater bleed in Mine Units 7 and 10. At the end of the inspection period, the licensee re-established bleed operations in Mine Unit 5.

At the time of the onsite inspection, the NRC was still reviewing several licensee submittals that provided supplemental details for certain program areas. These program areas were not reviewed in detail during the inspection but will be reviewed during future inspections, after the NRC has reviewed and approved the revised program requirements. The program areas still under NRC review included: (1) the contamination control program as identified in License Condition 9.8, (2) the procedures and training for non-radiation safety personnel designated to survey resin trucks leaving the restricted area as identified in License Condition 9.12, (3) the procedures and training used by the radiation safety officer designate to conduct daily inspections as identified in License Condition 9.12, (4) the onsite meteorological parameters to show compliance with 10 CFR Part 20 as identified in License Condition 9.15, (5) the airborne effluent and environmental monitoring program, including estimating doses to members of the public, as identified in License Condition 11.3, and (6) the minimum detectable concentrations for radiation survey instruments as identified in License Condition 11.9.

1 Management Organization and Control (88005)

1.1 Inspection Scope

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

1.2 Observations and Findings

a. Organizational Structure

The inspector reviewed the licensee's current organizational structure and compared it to the structure presented in Figure 5.1 of the amended license application (ADAMS Accession No. ML103280266). This figure depicted the required organizational structure

of the radiation safety and environmental protection staff. At the time of the onsite inspection, all positions specified in Figure 5.1 were filled with qualified individuals.

Site staffing consisted of 22 individuals, up slightly since the May 2015 inspection. Site staffing was supplemented by six individuals in the main office. Contractors and part-time consultants were utilized as necessary for special tasks. In summary, site staffing was consistent with license application requirements, and the staffing appeared sufficient for the work in progress at the time of the inspection.

b. Audits and Inspections

Regulation 10 CFR 20.1101(c), License Condition 9.3, and license application Section 5.3 require the licensee to conduct an annual review of the radiation protection and As Low As Reasonably Achievable (ALARA) programs. In addition, License Condition 12.3 requires the licensee to submit the results of the ALARA audit to the NRC. The inspector reviewed the annual ALARA audit for 2015. This audit was conducted by the licensee in May 2016. The inspector confirmed the accuracy of the report findings. The inspector concluded that the audit provided a thorough review of the radiation safety program. The licensee plans to submit the results of the ALARA audit to the NRC in the next annual report.

c. Safety and Environmental Review Panel (SERP)

The inspector reviewed the following Safety and Environmental Review Panel (SERP) evaluations conducted by the licensee as authorized under License Condition 9.4:

- SERP 13-05 was developed to evaluate the addition of wellfield filtration units; the licensee chose not to pursue this change, and the SERP evaluation was voided.
- SERP 14-01 was developed to review whether the Honeymoon yellowcake material could be processed without a license amendment, but the licensee concluded that a license amendment was necessary.
- SERP 15-02 was issued to determine other possible uses for permeate water; the licensee didn't complete the evaluation, and SERP 15-02 was not approved.
- SERP 15-03 was issued to review and approve Irigaray CPP modifications for accepting and processing uranium-loaded resins from other in-situ recovery sites; further discussion of this SERP evaluation is provided below.
- SERP 16-01 was an annual review of the license renewal application Section 7.5, Effects of Accidents; the licensee conducted this annual review in accordance with the requirements of License Condition 9.18.

The inspector reviewed SERP 15-03 in detail. The SERP reviewed and approved Irigaray CPP modifications and procedure changes to accept and process uranium-loaded resins from other in-situ recovery facilities, a process known as toll milling. The SERP approved this evaluation in October 2015.

The licensee used the guidance provided in NRC Regulatory Issue Summary (RIS) 2012-06. This RIS provided the NRC's policy regarding submittal of amendments for processing of equivalent feed material at licensed uranium recovery facilities. The RIS states that the receipt and processing of equivalent feed at an NRC-licensed facility does not require a license amendment if the resin is chemically and physically essentially the same as that which is currently processed and would be processed using the facility's existing equipment. Further, the receipt and processing of equivalent feed cannot exceed the licensee's uranium production limit, stays within the facility's environmental and safety review envelope, and does not result in additional waste streams. The licensee's SERP concluded that the receipt and processing of uranium-loaded resins from other sites could be accomplished at the Irigaray CPP in accordance with the guidance provided in RIS 2012-06.

The inspector reviewed the Irigaray CPP and procedure changes established by the licensee to implement toll milling. The licensee added new resin transfer lines and a holding tank, to keep the toll milling uranium production stream separate, as much as possible, from the resin material originating from Christensen Ranch. The licensee's staff indicated that these Irigaray CPP changes were discretionary and were not required for toll milling. The inspector noted that the licensee made several procedural changes for describing the two production streams. The inspector conducted a walk-down of the procedures with operations staff and concluded that the procedures provided sufficient detail for the operational activities. In summary, the inspector concluded that SERP 15-03 evaluation was conducted in accordance with the guidance provided in RIS 2012-006, and the licensee did not have to submit a license application to the NRC for toll milling operations.

The inspector reviewed the renewed license application for consistency with the conclusions documented in SERP 15-03. The inspector noted that Section 3.4.1 was not consistent with the conclusions of the SERP evaluation. In particular, Section 3.4.1 allows acceptance of slurry material for processing from a third-party, but this section does not mention acceptance of uranium-loaded resins. The licensee's staff agreed to review this portion of the license application and to update the application accordingly.

Finally, License Condition 9.4(e) requires the licensee to furnish in an annual report to the NRC a summary of the SERP evaluations. The most recent annual report was dated February 28, 2016 (ML16095A076). This report included a summary of SERP evaluations completed in 2015.

d. Verification of Additional Protocol Reporting Requirements

The inspector verified that the licensee provided the NRC with appropriate documentation to comply with the Additional Protocol information requirements specified in 10 CFR 75.11. The licensee was required to produce two sets of forms for the two sites, the Irigaray CPP and the Christensen Ranch satellite plant. The licensee submitted Forms AP-1, Certification, AP-2, Contact Information, AP-7, Concentration Plant Operations, and AP-16, Continuation Form for 2015 to the U.S. Department of Commerce by letter dated January 21, 2016. The information provided on the forms included capacity of uranium production and actual annual yellowcake production during 2015. The inspector concluded that the reports were accurate and complete.

- e. (Open) Unresolved Item 040-08502/1301-01: SERP approval of monitoring wells located outside of permit boundary

During the January 2013 inspection, documented in NRC inspection Report 040-08502/13-001 dated March 1, 2013 (ML13063A408), the NRC identified an Unresolved Item (URI) related to the licensee's approval, through the SERP process, of the installation and operation of several monitoring wells located outside of the NRC-licensed boundary. Although approved by the State of Wyoming, the inspector questioned whether the licensee had the authority to make these incidental boundary revisions without prior NRC approval. The applicable SERP evaluations include SERPs 12-01A, 12-01B, and 12-08.

The NRC conducted additional reviews of this URI during the July-August 2013 inspection, and the results of these reviews are documented in NRC Inspection Report 040-08502/13-002; 040-08502/14-001 dated December 11, 2014 (ML14345B073).

During this inspection, the inspector reviewed the status of the URI. The inspector observed some of the monitoring wells during site tours. This URI remains open pending an NRC legal review of the licensee's approval and implementation of these three SERP evaluations.

1.3 Conclusions

The organizational structure and staffing maintained by the licensee during the inspection period met the requirements specified in the license and were sufficient for the work in progress. Audit and program reviews were conducted in accordance with license and regulatory requirements. The licensee's safety and environmental review evaluations were performed in accordance with license requirements. The licensee submitted the Additional Protocol notifications as required by regulation. The NRC reviewed the status of a previously-identified URI related to incidental wellfield boundary revisions, but the URI remained open pending an NRC legal review.

2 In-Situ Leach Facilities (89001)

2.1 Inspection Scope

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

2.2 Observations and Findings

- a. Review of Operations at the Christensen Ranch Satellite Plant

License Condition 10.4 allows the licensee to conduct operations at a maximum flow rate of 9,000 gallons per minute (gpm), exclusive of restoration flow. During March-May 2015, the licensee reduced the Christensen Ranch injection flow rate to essentially zero but continued to maintain a wellfield bleed (recovery flow) of about 71 gpm. At that time, the licensee chose to reduce production at the Christensen Ranch satellite plant due to market conditions and to complete equipment repairs, upgrades, and well mechanical integrity tests.

During March 2016, the licensee increased the injection flow from essentially zero to 400-500 gpm. By July 2016, the licensee had increased the injection flow to about 1,500 gpm. At the time of the onsite inspection, the injection flow was 1,407 gpm while the recovery flow was 1,460 gpm. Seven header houses were in service in Mine Unit 8, injecting native water into the ore zone. The remainder of the header houses in this mine unit were used for recovery operations only. The licensee also maintained a bleed in Mine Units 7 and 10. The combined bleed rate for the three mine units was about 60 gpm during the inspection.

The licensee was not injecting lixiviant as allowed by License Condition 10.1 into any wellfield at the time of the inspection. Uranium was still being recovered from production water originating from the three mine units. The production water was being recirculated back to the mine units after being stripped of uranium in the Christensen Ranch ion exchange columns. At some point in the future, the licensee plans to develop Mine Units 9, 11, and 12. At the time of the onsite inspection, no development work was in progress in these mine units.

The inspector reviewed the licensee's injection manifold pressure records. The licensee summarized the maximum injection pressures on a weekly basis. In addition, the inspector observed manifold pressures during site tours. None of the manifold pressures exceeded 140 pounds per square inch, the maximum permissible pressure allowed at the Christensen Ranch site.

License Condition 10.1 requires the licensee to maintain an inward hydraulic gradient by maintaining a bleed in each individual wellfield starting when lixiviant is first injected into the production zone and continuing until the ground water restoration stability monitoring has begun. Using injection and recovery data supplied by the licensee, the inspector confirmed that a production bleed had been maintained in Mine Units 7, 8, and 10 since the previous inspection, conducted in May 2015.

However, the inspector identified that the licensee suspended the production bleed from Mine Unit 5-2 starting the week of June 12, 2015. At the time of the onsite inspection, the licensee continued to suspend the bleed from Mine Unit 5-2. The licensee's failure to maintain a bleed from Mine Unit 5-2 from mid-June 2015 to July 28, 2016, was identified as a violation of License Condition 10.1 requirements (VIO 040-08502/1601-01). Maintaining a bleed is safety significant as it maintains an inward hydraulic gradient and keep fluids contained within the wellfield and away from underground sources of drinking water outside the perimeter ore zone monitoring wells. The bleed helps to maintain the inward hydraulic gradient after production has stopped. In response, Uranium One staff stated that they haven't experienced any excursions within the past year but resumed bleed operations immediately after the conclusion of the onsite inspection.

The inspector reviewed quarterly and semi-annual reports submitted to the NRC and the Wyoming Department of Environmental Quality and determined that the flow rates reported since the previous inspection (conducted in May 2015) were below 9,000 gpm and are consistent with those currently reported by the licensee.

License Condition 10.7 states that all liquid effluents from process buildings and other process waste streams shall be returned to the process circuit, discharged to the solution evaporation ponds, or disposed as allowed by NRC regulations. The licensee

disposed of waste water by evaporation and deep well disposal. Three of four evaporation ponds were in service at Christensen Ranch. Pond CR-2 was out of service due to a liner leak. The permeate pond needed embankment repairs, and the licensee was in the process of taking the pond out of service. Two deep disposal wells were in service, disposing of waste water at a total flow rate of 53 gpm.

License Condition 11.2 states, in part, that written progress reports shall be submitted to the NRC for monitor well excursions. Three mine unit excursions were reported to the NRC since May 2015. To begin with, Monitor Well 2MW-84 was reported on excursion by letter dated July 31, 2015 (ML15216A512). The licensee subsequently informed the NRC by letter dated September 24, 2015 (ML15271A116) that the well had been taken off excursion. Monitor Well 8MW-37A was reported on excursion to the NRC by letter dated May 5, 2016 (ML16133A252), and was reported off excursion in a report dated June 2, 2016 (ML16167A420). Finally, Monitoring Well 8MW-36A was reported on excursion in a report dated June 2, 2016 (ML16155A325). The licensee subsequently notified the NRC by letter dated August 4, 2016 (ML16221A618), that the well was no longer on excursion.

License Condition 12.2 requires the licensee to report certain spills, leaks, and incidents to the NRC. The licensee reported one unplanned release of 2,100 gallons of byproduct material to the NRC. The release occurred in Mine Unit 2, Module 2-4 from December 5-7, 2015. The spill summary report was provided to the NRC by letter dated December 28, 2015 (ML16103A374). The licensee documented and reported the spill as required by the license.

License Condition 10.2 states, in part, that the licensee shall perform well integrity tests on each injection and production well before the wells are utilized and on wells that have been serviced with equipment or procedures that could damage the well casing. Additionally, each well shall be retested at least once every five years. The inspector reviewed the licensee's 5-year mechanical integrity test (MIT) records for injection wells tested in 2016. The inspector found that all wells had been tested within the 5-year time frame with the exception of Well MW71-258. This well was previously tested on January 24, 2011, and was retested on April 4, 2016, an interval greater than 5 years. The inspector concluded that the licensee's failure to test this injection well within 5 years was not safety significant because no injection occurred within mine unit 7 after May 8, 2015. The licensee reported that 15 wells failed the MIT test in 2016. The licensee reported that all of these wells have been reconditioned or properly abandoned as of the date of the inspection, meeting license requirements.

During the review of the license requirements for integrity testing of wells, the inspector noted a minor discrepancy with a reference in the license renewal application. License Condition 10.2 states, in part:

The licensee shall construct all wells in accordance with methods described in Section 3.3.2 of the approved license application...Integrity tests shall be performed in accordance with Section 3.3.2.2 of the approved license application. Any failed well casing that cannot be repaired to pass the integrity test shall be appropriately plugged and abandoned, using procedures set out in Section 3.3.2 of the approved license application.

Section 3.3.2.2, Well Integrity Testing Procedures, of the most current license renewal application states, in part, that “incompetent wells which are not repaired will be plugged and abandoned as described in Section 6.2.3.1.” The inspector noted that there was no Section 6.2.3.1 in the license renewal application; however, there was a Section 6.2.1 titled, “Well Plugging and Abandonment.” In summary, the reference to Section 6.2.3.1 appears to be a typo, and the license renewal application should reference Section 6.2.1. The licensee agreed to review the license renewal application and correct the apparent reference mistake via the performance-based license process specified in License Condition 9.4.

License Condition 10.4 requires the licensee to establish upper control limits (UCLs) for monitor wells, and License Condition 11.2 provides the sampling requirements for designated monitor wells. The inspector reviewed the monitor well UCL data for the second quarter of 2016. All wells appeared to have been sampled twice per month as required by the license, with the exception of Well 10 MW29. Only one sample was taken in from 10 MW29 in April 2016. The licensee indicated that the well could not be physically sampled due to flooding in the vicinity of the well. The inspector agreed that the licensee provided a reasonable explanation of the missed sampling, but reminded the licensee to report the reasons for missed samples when reported.

The licensee submitted a Wellfield Restoration Report for the Christensen Ranch mine units 2-6 on April 8, 2008 (ML081060129). NRC responded to the request with an evaluation report on October 23, 2012, that did not approve the restoration (ML12174A036). The licensee submitted a response to the NRC evaluation for the Christensen Ranch mine units 2-6 Restoration Report to the NRC by letter dated September 11, 2015 (ML15261A557). The licensee requested approval of restoration in mine units 2-4 and 6 and removed the request for restoration approval of mine unit 5 in the September 11, 2015 response. The NRC subsequently accepted the report by email dated December 30, 2015 (ML15364A203). At the time of the onsite inspection, the NRC had not formally approved the licensee’s restoration report. The wells in Mine Units 2, 3, 4 and 6 were sampled for UCLs quarterly as allowed by NRC since the wellfields have undergone restoration and are awaiting final approval. The inspector reviewed the sampling records and determined that the wells were sampled by the licensee on a quarterly basis during the inspection period.

b. Review of Operations at the Irigaray Central Processing Plant

The Irigaray CPP contains the equipment needed to accept uranium-bearing resins from the Christensen Ranch satellite plant and other offsite locations for chemical processing and drying into powdered yellowcake. The Irigaray CPP was in operation during the inspection, although at a reduced capacity. The inspector toured and observed CPP operations and operational parameters. In summary, the licensee appeared to be operating the Irigaray CPP in accordance with site procedures. Irigaray CPP parameters (flow, pressure, etc.) were observed to be within the limits established in the license and site procedures. The licensee is licensed to produce 2.5 million pounds of yellowcake annually. Current uranium production levels were well below the licensed limit.

The licensee reported that the Irigaray CPP received approximately one uranium-loaded resin shipment per week from the Christensen Ranch satellite plant. The licensee was also receiving occasional shipments of loaded resins from a different uranium recovery

licensee. The licensee commenced with toll milling in March 2016. To support toll milling, the licensee established separate pathways within the Irigaray CPP for the two sources of uranium, for accountability reasons. The licensee installed a new holding tank and several resin transfer lines to support the transfer of resins to and from the other licensee's resin transfer tanker. The inspector observed the equipment in operation and noted that the licensee had updated site procedures and drawings to depict the new flow path. Licensee staff pointed out that the new holding tank and transfer lines were constructed and placed into service as a convenience, and that it could use the Christensen Ranch resin processing equipment if needed.

The partially processed yellowcake was being stored in two thickeners at the Irigaray CPP, one for each source of uranium. The licensee dried the material in batches. The dryer was not in service during the inspection, thus, this program area was not inspected in detail.

Four evaporation ponds are located at the Irigaray site. At the time of the inspection, Pond D had signs of leakage. The pond was being drained for cleaning. After cleaning, the pond liner will be inspected and repaired. The inspector noted that pond freeboard remained below licensed limits for all four ponds.

Finally, License Condition 9.13 requires the licensee to monitor sage grouse leks on an annual basis. The most recent survey results were included in the annual report to the State of Wyoming and the NRC dated August 18, 2015 (ML15252A233). The annual wildlife survey report dated December 2014 reported no leks at the Irigaray site, three leks at the Christensen Ranch site, and five leks outside of the perimeter boundary.

c. Review of Standard Operating Procedures

License Condition 9.6 requires that standard operating procedures be established and followed for all operational process activities involving radioactive materials that are handled, processed, stored, or transported by the licensee. The inspector reviewed several site procedures and observed licensee staff conducting operations with instructions provided in these site procedures.

To begin with, the inspector reviewed and observed the licensee's procedures that were updated to support toll milling operations. The revised procedures included the resin transfer and elution circuit procedures. The inspector noted that the licensee began adding photographs of the equipment to be operated. The inspector considered this practice a management strength, because the use of photographs should help minimize incorrect operation of Irigaray CPP equipment. The inspector also noted that the licensee updated CPP process flow drawings to supplement the revised site procedures.

The inspector also observed licensee staff conducting inspections of the waste water evaporation ponds at the Christensen Ranch satellite plant using the guidance provided in the pond inspection, sampling, and repair procedure ENV-5, Revision 6. The inspector noted that the licensee's staff conducted the weekly inspections in accordance with procedure requirements. However, the licensee's staff conducted the pond leak detection system measurements differently than described in the procedure. The licensee staff physically measured the depth of the fluid in the underdrains, while the procedure provided instructions for electronic depth measurements. This finding was not safety significant because the method used by the licensee staff to measure the

amount of fluid in the underdrains met the intent of License Condition 11.4. The licensee's representatives stated that they would update the procedure and provide staff training on the updated procedure as necessary.

The inspector reviewed the licensee's dryer operation and drumming records for 2016, to ensure compliance with the requirements specified in License Conditions 9.3, 9.6, and 10.8. The licensee processed one lot of yellowcake during 2016 that was packaged in 20 drums. The licensee's records indicate that the dryer temperature, drying time, drum venting time, and drum vent verifications were conducted in accordance with procedure requirements. The licensee shipped these drums to a domestic conversion facility.

Finally, License Condition 9.6 requires the radiation safety officer to review all procedures at least annually. The licensee maintained records indicating that all procedures had been reviewed at least annually, most recently in December 2015. The radiation safety officer also reviewed procedures when revised.

d. Site Tours

The inspector conducted site tours to observe in-situ recovery operations in progress. Areas toured included the Irigaray CPP, Christensen Ranch satellite, mine units, and representative header houses. The inspector noted that radiation protection postings were in accordance with License Condition 9.11 and 10 CFR Part 20 requirements. Access controls included fences, gates, and locked doors as appropriate. Irigaray CPP and Christensen plant parameters were found to be within required operating intervals, and equipment appeared to be in good condition. In summary, the licensee was maintaining control of the restricted areas and equipment in accordance with procedure, license, and regulatory requirements.

The inspector conducted independent radiological surveys of the gamma exposure rates within the both plants. The surveys were conducted using a Ludlum Model 2401-EC survey meter (NRC No. 21176G with calibration due date of April 5, 17). All radiation areas were properly posted, and radiologically restricted areas were properly secured by the licensee.

e. Confirmatory Survey of Decommissioned Irigaray Mine Units 1-9

By letter dated August 7, 2015, the licensee submitted a final status survey decommissioning report to the NRC for Irigaray Mine Units 1-9 (ML15231A096). The report documented the licensee's final status survey efforts. The NRC had previously approved the licensee's groundwater restoration activities. The NRC's approval is provided in the letter dated September 20, 2006 (ML062570175).

The NRC conducted a review of the licensee's final status survey decommissioning report and subsequently requested additional information by letter dated July 5, 2016 (ML16099A346). The licensee had not responded to the NRC's request by the close of the onsite inspection, and the licensee's staff indicated that they will most likely ask for an extension to respond to the NRC's request for information.

During the inspection, staff from ORAU were onsite to perform a confirmatory verification survey on behalf of the NRC. The ORAU staff developed a survey plan, in part, to verify

the results of the licensee's final status survey. The ORAU staff surveyed two structures and the surfaces of former Irigaray Mine Units 1-9. The survey consisted of surface scans, fixed point measurements, and soil sampling. The ORAU staff completed the surveys of the structures but were only able to complete roughly half of the planned survey scans and soil sampling in the mine units. The results of the ORAU survey will be presented in a future letter to the NRC. The NRC's analysis of the sampling results and ORAU's survey report will be provided to the licensee under separate correspondence at a later date.

2.3 Conclusions

The licensee was operating the facility as required by procedure, license, and regulatory requirements, with one exception. The licensee's failure to maintain a bleed in one wellfield was identified as a violation of the license. The licensee established and maintained procedures with one minor exception. The licensee's evaporation pond underdrain sampling instructions were inconsistent with the method used by licensee staff to actually measure the underdrains. The licensee's use of photographs in procedures was viewed as a management strength. The licensee continued to perform procedure reviews in accordance with license requirements. The inspector conducted site tours and confirmed that the radiologically restricted areas were properly posted and access control was maintained with gates, fences, and locked doors. A confirmatory survey was conducted by the NRC's contractor during the inspection. The results of the survey will be presented to the licensee at a later date under separate correspondence.

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

The inspector reviewed the licensee's dose assessment records for calendar year 2015. During the first quarter of 2015, the licensee continued to process Honeymoon yellowcake material as allowed by License Condition 10.22. This activity had the potential for increased worker exposures to uranium due to drum tipping operations and the low solubility of the product. The licensee's records indicate that approximately 30 workers were monitored at the beginning of the year, and by the end of the year after completion of the Honeymoon yellowcake material work, approximately 15 workers were monitored.

Occupational exposures consisted of a combination of external and internal doses. The final assigned doses were a combination of external doses, internal radon progeny, internal uranium, radiation work permit assigned doses, and breathing zone doses if the worker was assigned a lapel air sampler.

During 2015, the highest total effective dose equivalent for a worker was 0.288 rem with a regulatory limit of 5.0 rem. This individual was an operator at the Irigaray CPP. For comparison, the highest total effective dose equivalent exposure for 2015 was less than the highest total effective dose equivalent for 2014 (0.379 rem). At the Christensen

Ranch site, the highest total effective dose equivalent was 0.115 rem, assigned to a satellite plant operator. The doses at Christensen Ranch Satellite plant are expected to be lower than the Irigaray site, because the uranium product typically does not become airborne at the Christensen Ranch site.

The inspector briefly reviewed the licensee's dose records for 2016. During the first quarter of 2016, one Irigaray operator received an estimated dose of 0.056 rem, and during the second quarter, an operator received an estimated dose of 0.045 rem. These doses were comparable to or less than the doses received in 2015.

The licensee collected urine bioassay samples to assess the potential for intakes of uranium. The licensee collected these bioassay samples to verify if engineering controls provided sufficient protection from contamination. The licensee's records indicate that it collected approximately 200 samples in 2015 and 100 samples in the first half of 2016. Two sample results collected in early 2016 exceeded the lowest action level of 15 micrograms of uranium per liter of uranium. The licensee's investigation revealed that the causes of the exceedances were attributed to poor hygiene practices.

The licensee continues to transition from paper calculations and recordkeeping to electronic recordkeeping. The licensee had not fully implemented this administrative recordkeeping at the time of the inspection. This program area will be reviewed during future inspections, to ensure that the licensee has adequately and accurately implemented electronic recordkeeping.

The inspector briefly reviewed the licensee's occupational air sampling program. In accordance with License Condition 10.10 requirements, the licensee measured airborne uranium and radon progeny concentrations monthly at both the Christensen Ranch and Irigaray facilities. The licensee also collected samples from 21 module buildings. The results of these surveys are included in the annual dose assessments.

License Condition 10.9 states, in part, that the licensee shall use radiation work permits for all work or non-routine maintenance jobs where a potential for significant radiation exposure to radioactive material exists or for which no standard written operating procedure exists. The inspector reviewed the radiation work permits issued in 2015-2016. The licensee issued 61 permits in 2015 and 11 permits in 2016. The permits were issued for dryer maintenance, filter press maintenance, and tank entries. As a precaution, the licensee issued a radiation work permit for the first resin transfer received from another facility for toll milling. All radiation work permits included radiological sampling and personal protective equipment requirements.

3.3 Conclusions

The licensee implemented a radiation protection program that met the requirements of 10 CFR Part 20 and the license. During 2015-2016, annual doses to employees were well below the regulatory limits. The licensee's occupational air sampling and radiation work permit programs were in compliance with license requirements.

4 Radioactive Waste Management and Transportation Activities (88035 and 86740)

4.1 Inspection Scope

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

4.2 Observations and Findings

a. Inspection of Transportation Activities

Regulation 10 CFR 71.5 states, in part, that each licensee who transports licensed material outside the site of usage, as specified in the NRC license, shall comply with the applicable requirements of the U.S. Department of Transportation regulations. The licensee typically ships resins, yellowcake, and byproduct material wastes. The inspector reviewed the licensee's records for recent transportation shipments. In summary, the licensee's records indicated that the shipments were made in accordance with U.S. Department of Transportation regulations.

Since the last inspection, the licensee shipped a load of 20 drums containing dried yellowcake to a domestic conversion facility. The licensee also shipped four loads of byproduct wastes to a disposal site in 2015. At the time of the inspection, the licensee had not shipped byproduct material wastes in 2016. The disposed material included filter press wastes, scrap material, contaminated soil, and bag filters. The licensee manifested the wastes, in part, using the exposure rates of the loaded wastes. The licensee also manifested empty containers for return shipment to Willow Creek.

The licensee resumed resin shipments in March 2016, after a several month delay. At the time of the inspection, the licensee shipped approximately one shipment, round trip, between the Christensen Ranch and Irigaray sites. The licensee created shipping papers for the shipments to and from the Christensen Ranch site. The licensee also started receiving uranium-loaded resins from a third party for toll milling. The licensee maintained records of the shipments to and from this other licensee.

The inspector reviewed the licensee's shipping program and compared the program to the requirements provided in the applicable site procedure. The inspector concluded that the licensee was shipping radioactive material in accordance with procedure and regulatory requirements.

b. Solid Radioactive Waste

License Condition 9.7 requires, in part, that the licensee maintain a byproduct waste disposal agreement to dispose of Atomic Energy Act of 1954 as amended Section 11e.(2) byproduct material at an offsite location. The inspector reviewed the waste disposal agreement and determined that it was valid at the time of the inspection. The licensee submitted an updated waste disposal agreement to the NRC by letter dated May 13, 2016 (ML16139A896). (The agreement is being withheld from public disclosure because it contains privileged, or confidential commercial, or financial information consistent with 10 CFR 2.390.) The disposal site is a licensed site that is authorized to receive and dispose of byproduct material. In summary, the licensee

continues to maintain a disposal agreement as required by the license for disposal of byproduct material wastes.

4.3 Conclusions

The licensee's records indicated that it transported radioactive material in accordance with U.S. Department of Transportation requirements. The licensee continued to maintain a waste disposal agreement as required by the license.

5 Effluent Control and Environmental Protection (88045 and 87102)

5.1 Inspection Scope

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

5.2 Observations and Findings

The licensee is required by 10 CFR 40.65 and License Condition 12.1 to submit semi-annual reports to the NRC. The inspector briefly reviewed the two semi-annual reports for 2015, submitted to the NRC by letters dated August 31, 2015 (ML15245A339), and February 28, 2016 (ML16095A076). These particular reports are currently being evaluated by NRC headquarters staff. The results of the NRC's formal review of these documents will be provided to the licensee under separate correspondence.

Regulation 10 CFR 20.1301(a) provides a dose limit for individual members of the public at 0.1 rem. During this inspection, the inspector reviewed the licensee's public dose assessment and the methods used to calculate these doses. The inspector discussed the results with the licensee staff responsible for calculating public doses. The licensee's analysis indicated that the nearest member of the public were off-duty workers temporarily residing at the two man-camps. The licensee's records indicated that the potential dose to members of the public at the Irigaray man-camp was 0.00048 rem, while the potential dose to members of the public at the Christensen Ranch site was 0.00864 rem. Both calculated results were well below the 0.1 rem regulatory limit.

5.3 Conclusions

The licensee submitted semi-annual reports to the NRC in accordance with license and regulatory requirements. The inspector confirmed that public doses during 2015 were less than the regulatory limit.

6 Exit Meeting Summary

The inspector presented the inspection results to the licensee's representatives at the conclusion of the onsite inspection on July 28, 2016. During the inspection, the licensee did not identify any information reviewed by the inspector as proprietary that was included in the report.

SUPPLEMENTAL INSPECTION INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

L. Arbogast, Senior Radiation Safety Technician
K. Filbert, Environmental Specialist
S. Graham, Operations Supervisor
G. Kruse, Manager of U.S. Operations
R. Kukura, Mine Manager
D. Rynders, Site Safety/Radiation Safety Officer
S. Schierman, Manager, Health, Safety and Environment

Wyoming Department of Environmental Quality

B. O'Brien, Uranium Recovery Program Engineer

Oak Ridge Associated Universities

N. Altic, Health Physicist
J. Bailey, Health Physicist Tech II
K. Engel, Health Physicist
A. Kirthlink, Health Physicist Tech II

INSPECTION PROCEDURES (IPs) USED

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

ITEMS OPENED, CLOSED AND DISCUSSED

Opened

040-08502/1601-01 VIO Failure to maintain wellfield bleed

Closed

None

Discussed

040-08502/1301-01 URI SERP approval of monitoring wells located outside of permit boundary

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
ALARA	As Low As Reasonably Achievable
CFR	Code of Federal Regulations
CPP	Central Processing Plant
gpm	gallons per minute
IP	NRC Inspection Procedure
MIT	mechanical integrity test
NRC	U.S. Nuclear Regulatory Commission
ORAU	Oak Ridge Associated Universities
RIS	NRC Regulatory Issue Summary
SERP	Safety and Environmental Review Panel
URI	NRC Unresolved Item
VIO	NRC violation

G. Kruse

- 2 -

extent possible, your response should not include any personal, privacy, proprietary, or safeguards information so that it can be made available to the public without redaction.

Should you have any questions concerning this inspection, please contact Dr. Robert Evans at 817-200-1234 or the undersigned at 817-200-1197.

Sincerely,

/RA by LEBrookhart Acting for/

Jack E. Whitten, Chief
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

Docket: 040-08502
License: SUA-1341

Enclosures:

1. Notice of Violation
2. NRC Inspection Report 040-08502/16-001

cc w/enclosures:

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NAME	REvans	RLinton		JWhitten
SIGNATURE	Via email	Via email		/RA by LEBrookhart Acting for/
DATE	8/26/16	8/26/16		8/26/16

OFFICIAL RECORD COPY

Letter to Greg Kruse from Jack Whitten dated August 26, 2016

SUBJECT: NRC INSPECTION REPORT 040-08502/16-001 AND NOTICE OF VIOLATION

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