



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
612 EAST LAMAR BLVD, SUITE 400
ARLINGTON, TEXAS 76011-4125

April 2, 2010

John H. Ellis, President
Sequoyah Fuels Corporation
P.O. Box 610
Gore, Oklahoma 74435

SUBJECT: NRC INSPECTION REPORT 040-08027/10-001

Dear Mr. Ellis:

This refers to the inspection conducted on March 10-11, 2010, at the Sequoyah Fuels Corporation site located near Gore, Oklahoma. This inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel. The enclosed report presents the results of this inspection. In summary, the inspectors determined that you were conducting decommissioning activities in compliance with regulatory and license requirements, with one exception.

Based on the results of this inspection, the NRC has determined that one Severity Level IV violation of NRC requirements occurred. Your discovery of contaminated equipment in an unrestricted area was determined to be a violation of the license. The violation is being treated as a noncited violation (NCV), consistent with Section VI.A of the Enforcement Policy. The NCV is described in the subject inspection report. If you contest the violation or significance of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to: (1) the Regional Administrator, Region IV, 612 East Lamar Blvd., Arlington, Texas 76011-4125; and (2) the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," 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 document system (ADAMS), accessible from the NRC's Web site at <http://www.nrc.gov/reading-rm/adams.html>. If you choose to respond, 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.

Should you have any questions concerning this inspection, please contact Mr. Robert Evans, Senior Health Physicist, at (817) 860-8234 or the undersigned at (817) 860-8191.

Sincerely,

/RA/

D. Blair Spitzberg, PhD, Chief
Repository and Spent Fuel Safety Branch

Docket: 040-08027
License: SUB-1010

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NRC Inspection Report 040-08027/10-001

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket: 040-08027

License: SUB-1010

Report: 040-08027/10-001

Licensee: Sequoyah Fuels Corporation

Location: Highway 10 and Interstate 40
Gore, Oklahoma

Dates: March 10-11, 2010

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Repository and Spent Fuel Safety Branch

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ENCLOSURE

Approved by: D. Blair Spitzberg, PhD, Chief
Repository and Spent Fuel Safety Branch

Attachment: Supplemental Inspection Information

EXECUTIVE SUMMARY

Sequoyah Fuels Corporation NRC Inspection Report 040-08027/10-001

This inspection was a routine, announced inspection of decommissioning activities being conducted at the Sequoyah Fuels Corporation site. This inspection included a review of the licensee's implementation of the NRC-approved Reclamation Plan. In summary, the licensee was conducting decommissioning activities in compliance with license and regulatory requirements, with one exception as described below.

Management Organization and Controls; Decommissioning Inspection

- The organizational structure was in agreement with license requirements. A sufficient number of staff members were available for the decommissioning activities in progress. The licensee had a functioning As Low As Reasonably Achievable program as required by the license. Routine program reviews were conducted as required by the license and by regulations (Section 1).

Radiation Protection

- The licensee conducted its radiation protection program in accordance with the requirements of 10 CFR Part 20 and the license. Occupational exposures were below regulatory limits (Section 2).
- A non-cited violation was identified involving the licensee's discovery of contaminated equipment in the unrestricted area, a violation of the license (Section 2).

Maintenance and Surveillance Testing

- The licensee maintained a sufficient number of calibrated survey meters for use at the facility. The licensee also conducted daily inspections of tailings and waste retention systems as required by the license (Section 3).

Effluent Control and Environmental Protection

- The effluent and environmental monitoring programs were implemented in accordance with license and regulatory requirements. The sample results indicated that liquid and gaseous radioactive effluent releases were less than regulatory limits. Elevated concentrations of radioactive material continued to be identified by the licensee in selected groundwater monitoring wells. In response, the licensee continued to implement an interim groundwater corrective action program (Section 4).
- The licensee continued to use ammonium nitrate solution as a fertilizer on land used to produce hay. The licensee implemented the fertilizer distribution program in accordance with license application requirements (Section 4).

Low Level Radioactive Waste Storage; Inspection of Transportation Activities

- The licensee effectively implemented and maintained a program for monitoring and securing solid waste storage as required by the license (Section 5).

Emergency Preparedness; Fire Protection

- The licensee maintained an emergency preparedness program that included instructions and equipment for responding to contamination spills and individuals who become injured at the licensee's facilities (Section 6).

Onsite Construction

- The licensee was constructing the onsite disposal cell in accordance with Reclamation Plan requirements (Section 7).

Report Details

Summary of Plant Status

At the time of the inspection, the licensee was conducting site decommissioning. Site decommissioning includes dismantlement and removal of systems and equipment, demolition of structures, removal and treatment of sludges and sediments, remediation of contaminated soils, and treatment of wastewater. Most of the residual waste material will be placed in an onsite disposal cell for permanent disposal. The disposal cell was originally designed for a capacity of 8.3 million cubic feet of disposed material, although the cell design can be modified to accommodate from 5 to 11 million cubic feet of material.

The disposal cell was being constructed in phases. During the inspection, the licensee was constructing Phase I of the onsite disposal cell. Phase I includes the northeastern portion of the cell. The licensee commenced with Phase I construction activities during early November 2009. Once the Phase I cell base has been constructed, the licensee will place potentially contaminated calcium fluoride material into the cell. Next, the licensee will excavate contaminated soils in the Phase II footprint. Soils in the Phase II area that exceed the NRC-approved cleanup level will be placed into the Phase I cell for disposal.

During 2009, the work activities included abatement of asbestos, dewatering of raffinate sludge material, preparing the clay borrow area for excavation, constructing the haul road between the clay borrow area and the Phase I footprint, and continuing management of surface and groundwater. During 2010, the licensee expects to complete the construction of the Phase I base, permanently close Pond 2, remediate the emergency basin/north ditch, remediate the north fluoride holding base, remediate contaminated soil in the Phase II footprint, construct the Phase II base, and initiate building demolition.

The licensee still possesses approximately 11,500 tons of de-watered raffinate sludge. The sludge was being stored in heavy duty bags for possible offsite transfer to an out of state uranium mill for processing as alternate feed material. If the licensee is unable to transfer the material, the NRC-approved Reclamation Plan allows the licensee to dispose of the sludge in the onsite disposal cell.

1 Management Organization and Controls; Decommissioning Inspection Procedure for Materials Licensees (88005, 87104)

1.1 Inspection Scope

The inspectors reviewed management organization and controls to ensure that the licensee was maintaining effective oversight of decommissioning activities.

1.2 Observations and Findings

The organizational structure is provided in Section 11.1 and Figure 2-1 of the license application. At the time of the inspection, the plant staff consisted of five individuals: the president, environmental manager, senior health and safety technician, decommissioning and decontamination project supervisor, and administrative assistant. The licensee also received part-time support from the director of regulatory affairs. Contractors were used for geotechnical support, cell construction, radiation safety support, and miscellaneous site maintenance activities as needed. In addition, security

guards provided facility oversight during nights, weekends, and holidays. The inspectors concluded that the licensee had sufficient staff to ensure compliance with license and regulatory requirements.

The requirements for the As Low As Reasonably Achievable (ALARA) program committee are provided in Section 3.2.2 of the license application. In addition to annual committee meetings, the licensee is required to conduct an annual ALARA audit. The annual meeting was conducted on December 9, 2009. The inspectors reviewed the meeting minutes and discussed the results of the annual audit with committee members.

One requirement of the ALARA committee was to review trends. The committee reviewed recent trends, including elevated bioassay results that were due to asbestos abatement work in the radiologically restricted area, elevated concentrations of uranium in the outfall effluents, and increased radon concentrations inside a building that contained radioactive materials. The committee discussed causes of the trends and corrective actions taken since the time of discovery. The committee also discussed future work projects that had the potential for occupational exposures to site workers.

In addition to the annual ALARA audit, the licensee conducted an annual radiation program review in accordance with 10 CFR 20.1101(c) requirements during late-December 2009. The annual program review included a summary of occupational exposures for the year.

Finally, the corporate office conducted quarterly compliance audits. The corporate audits were conducted, in part, to ensure compliance with license requirements. Details of these audits were documented in quarterly reports which were available to the inspectors for review during the inspection.

1.3 Conclusions

The organizational structure was in agreement with license requirements. A sufficient number of staff members were available for the decommissioning activities in progress. The licensee had a functioning ALARA program as required by the license. Routine program reviews were conducted as required by the license and by regulations.

2 Radiation Protection (83822)

2.1 Inspection Scope

The inspectors examined the licensee's radiation protection program for compliance with the license and 10 CFR Part 20 requirements.

2.2 Observations and Findings

a. Occupational Exposures

The inspectors reviewed personnel monitoring records. Personnel monitoring included monitoring of both external and internal exposures of workers. The inspectors reviewed the licensee's occupational exposure records for the last quarter of 2008 and 2009.

To monitor for external exposures, thermoluminescent dosimeters were assigned to selected individuals. During 2009, 10 individuals were monitored with thermoluminescent dosimeters. The highest deep dose equivalent exposure to an individual during any one quarter was 31 millirems, and the maximum total exposure was 32 millirems. None of the occupational exposures exceeded the NRC's annual limit of 5,000 millirems.

The bioassay requirements are noted in License Condition 9.4. The licensee assigned internal exposures based on bioassay sample results. Bioassay sampling consisted of measurement of uranium concentrations in urine. The bioassay samples were analyzed by an outside laboratory. Of a total of 668 samples collected from November 2008 through October 2009, only 13 percent exceeded the detection limit. During December 2008, the results for two individuals exceeded the action level of 20 micrograms of uranium per liter of urine. In January 2009, results for four individuals also exceeded the action level. The maximum level for all analyses was 62.7 micrograms per liter. These elevated levels were attributed to the asbestos removal project. None of the sample results exceeded the NRC's reporting level.

To complement the bioassay program, the site also monitored internal exposures. The licensee measured the derived air concentration-hours (DAC-hours) to which individuals were exposed. In October 2008, the site total DAC-hour exposure was 98 DAC-hours, with levels decreasing to less than 40 DAC-hours in any month for the period January to October 2009, with a peak of 35 DAC-hours in September 2009. None of the internal exposures exceeded the NRC's annual limit of 2,000 DAC-hours.

b. NRC Review of Licensee's Condition Reports

The licensee used the Condition Report (CR) process to document potentially negative trends and events. The inspectors reviewed selected CRs during the inspection and discussed these reports with the licensee's representatives. In summary, the licensee was effectively using CRs to document potential problems and the corrective actions needed to mitigate these problems.

The first CR reviewed involved the licensee's recognition of a negative trend in bioassay sample results for contract asbestos abatement workers. During a previous inspection, conducted during February 5-6, 2009, it was noted that the licensee had initiated a formal investigation of the elevated bioassay samples submitted by contractors working on the asbestos abatement effort as described in Condition Report 09-2-1. The licensee noted that the slow turn-around time for sample results resulted in the licensee's delayed response to several elevated bioassay results. Therefore, a faster turn-around time of 5 days was proposed for bioassay samples. The licensee also noted that a more thorough characterization of the contamination potential that would be encountered during the asbestos abatement work would have prompted evaluation for use of enhanced contamination control, increased air sampling, and use of respiratory protection equipment by the scaffolding contractor. The licensee also noted that, for the asbestos and scaffolding contractors, training and supervision were not adequate considering the lack of prior training and experience of working in contaminated environments. Following completion of corrective actions, this CR was closed during March 2009. The licensee's corrective actions appear to have been effective because there have been no repeat occurrences of this type of event.

The licensee issued three CRs during 2009 and 2010 involving a loss of control of contaminated material. Condition Report 09-4-1 was written after contaminated material from Pond 2 sampling was found in a clean trash can located in the sample preparation area of the new warehouse. The trash was removed and the area surveyed to confirm that no contaminated material remained. This CR was closed during May 2009.

On December 1, 2009, the licensee discovered a contaminated hammer in the bed of a pickup truck located onsite but outside of the restricted area. The contamination was fixed (not removable) and was primarily beta-gamma contamination. The hammer was returned to the restricted area. Condition Report 09-12-1 outlined the efforts of the licensee to randomly check tools and equipment in the new warehouse and notes that several more contaminated items were found. At that time, the licensee did not survey all tools and equipment in the unrestricted area. This CR recommended that trucks and equipment continue to be surveyed and any contaminated items found be returned to the restricted area. This CR was closed during December 2009 with radiological surveys continuing in the unrestricted area. None of the tools were identified with contamination that exceeded the reportability levels.

The licensee developed a new procedure for access control. Survey requirements for exiting a restricted area are specified in the Area Access Control Procedure, Operating Procedure O-111, dated 01/10/10. The procedure notes that only items actually needed within the restricted area should be taken into the area, and the procedure emphasizes the need for contamination monitoring of personnel and equipment prior to exiting the restricted area.

On February 24, 2010, during a corporate audit, the auditor identified a contaminated ladder with high levels of fixed (not removable) beta-gamma contamination in the new warehouse, an unrestricted area. Further surveys confirmed the presence of additional contaminated tools in the administration building, another unrestricted area. The fixed beta-gamma contamination level on the ladder exceeded the allowed limit by more than a factor of 10; therefore, this incident was reported to the NRC. The licensee issued an event report to the NRC on March 16, 2010. At the time of the discovery of the ladder, the ongoing survey effort was given additional emphasis.

One possible reason for the contaminated tools and equipment in the unrestricted area involves previous survey practices. The licensee previously surveyed tools using alpha-detecting equipment. Around 1991, the licensee started surveying tools for beta-gamma contamination. The licensee speculated that the tools being identified with fixed beta-gamma contamination may have been surveyed and released during the time frame that the licensee was surveying tools and equipment for alpha contamination only. As a result of the licensee's discovery of the contaminated ladder, the licensee issued a CR. At the conclusion of the onsite inspection, CR 10-2-2 remained open, and equipment surveys continue to be conducted by the licensee.

License Condition 9.1 states that the licensee shall implement the statements, representations, and conditions contained in the license application. Section 3.3.4.7 of Part I to the license application provides the contamination control limits for equipment in all unrestricted areas. The direct (fixed) alpha and direct beta-gamma contamination limits are both 5,000 disintegrations per minute per 100 square centimeters. The licensee discovered a ladder with a direct, fixed contamination measurement of 448,000 disintegrations per minute per 100 square centimeters in the unrestricted area.

The licensee's discovery of contaminated equipment above the licensed limits in the unrestricted area was a violation of License Condition 9.1 (NCV 040-08027/1001-01). However, this violation is being treated as a non-cited violation consistent with VI.A of the NRC Enforcement Policy. The licensee identified the violation and took additional corrective actions in response to the violation. Additional corrective actions included a commitment to survey all equipment and tools in the unrestricted areas. Since the CR remained open at the end of the inspection period, the NRC will review the results of the licensee's surveys and the results of the investigation during a future inspection.

c. Hazardous Work Permits

Section 3.2.1 of the license application outlines hazardous work permit requirements. Hazardous work permits are used to control nonroutine work activities, particularly when these activities involve radioactive material or when a significant potential for personnel exposure exists. The inspectors reviewed selected hazardous work permits and noted that the permits identified specific radiological hazards and personnel protective equipment requirements for the identified hazards.

d. Training of Workers

The inspectors reviewed training records and interviewed site personnel to ensure that the licensee was implementing its training programs in compliance with regulatory and license requirements. The training program requirements are provided in Sections 2.6 and 11.4 of the license application. The inspectors confirmed that required training had been provided to the scaffolding and asbestos workers prior to work in the licensee's facilities. This training, "Construction Safety Training Course" by Oklahoma Asbestos Training Institute, was provided on January 15, 2010, to the various workers.

The last hazardous material transportation training was provided during February 2007. This hazardous material refresher training satisfies U.S. Department of Transportation training requirements but is valid for only 3 years from date of completion. Hazard material transportation training must be completed by site workers before any hazard material can be shipped from the site.

Radiation safety annual training was provided on January 10, 2010. Procedure training for all the employees was conducted on January 28, 2010. In summary, the licensee implemented its training program in accordance with license requirements.

2.3 Conclusions

The licensee conducted its radiation protection program in accordance with the requirements of 10 CFR Part 20 and the license. Occupational exposures were below regulatory limits. An NCV was identified involving the licensee's discovery of contaminated equipment in the unrestricted area, a violation of the license.

3 Maintenance and Surveillance Testing (88025)

3.1 Inspection Scope

The inspectors reviewed general maintenance, operations, and surveillance tests to ensure compliance with license requirements and approved procedures.

3.2 Observations and Findings

a. Instrument Calibrations

License application Section 3.3.3 requires that radiation survey instrumentation be calibrated at least every 6 months. The inspectors reviewed selected survey results and confirmed that survey instruments used to perform these surveys had been calibrated within the required 6-month frequency.

However, the inspectors noted that Condition Report 09-9-1 had been issued following the licensee's self-discovery that it had not been completing documentation as required for fixed air samplers. The air samplers were recalibrated and the documentation was

completed. This CR was subsequently closed upon completion of all corrective actions. The inspectors did not identify any recurrence of this problem, suggesting that the problem was an isolated incident.

b. Daily Site Inspections

License Condition 46 states that the licensee shall perform and document daily inspections of tailings and waste retention systems during normally scheduled workdays. The inspectors confirmed that the licensee conducted these inspections in accordance with guidance provided in site procedures.

At the time of the inspection, a site technician inspected the clarifier basin and emergency basin/north ditch on a daily basis. The technician inspected for openings, cracks, soft spots, and leaks in the levees as well as damage to the liners. The technician also verified that the water levels remained below the freeboard limits. During the inspection, the freeboard levels were found to be within procedure requirements.

The inspectors interviewed the technician that conducted the daily inspections. The technician explained how he verified the freeboard requirements. The inspectors also reviewed the daily impoundment inspection records for April 2008 to March 2010 and confirmed that the inspections were completed on all normally scheduled workdays and the data required by the implementing procedures were collected and recorded. No issues were observed by the technician during the daily inspections, except for April 24, 2009, when a section of ripped liner was observed in a clarifier basin. The ripped liner was subsequently repaired on May 1, 2009.

3.3 Conclusions

The licensee maintained a sufficient number of calibrated survey meters for use at the facility. The licensee also conducted daily inspections of tailings and waste retention systems as required by the license.

4 Effluent Control and Environmental Protection (88045)

4.1 Inspection Scope

The inspectors reviewed the licensee's effluent, groundwater, and environmental monitoring programs to verify compliance with regulatory and license requirements.

4.2 Observations and Findings

a. Effluent Monitoring Program

The liquid effluent monitoring program is described in Section 5.1 of the license application. The licensee monitored two release points, the combined stream Outfall 001 and the storm water Outfall 008. The inspectors observed the sampling equipment in service, and the equipment appeared to be operable at both locations.

In recent weeks, the licensee experienced several exceedances of total suspended solids at storm water Outfall 008. The highest sample result, 392 milligrams per liter, was collected on December 24, 2009. This sample result exceeded the action level of 114 milligrams per liter. The licensee concluded that the elevated total suspended solids in the storm water were due to clay runoff from the construction of the onsite disposal cell. The licensee reported these exceedances to the appropriate Oklahoma state office as required by the discharge permit.

b. Groundwater Monitoring Program

License Condition 49A requires the licensee to implement a groundwater compliance monitoring program as described in the groundwater monitoring plan dated February 25, 2005. Table 4 of the groundwater monitoring plan provides the sampling and analyses schedules. The program consisted of 86 monitoring locations, including six background wells, 64 point-of-compliance (POC) wells, six intercept trenches, four surface waters, and six corrective action monitoring locations.

The inspectors examined and compared the monitoring results for 2009 with the groundwater protection standards specified in License Condition 49.B. The primary chemical constituents analyzed included uranium, fluoride, nitrate, and arsenic. During 2009, six of the POC wells (MW045, MW056, MW047A, MW115A, MW123A, and MW130A) were dry at the time of sampling. The highest uranium concentrations were detected in Wells MW014, MW025, MW010, and MW087, and the highest fluoride concentrations were detected in Wells MW057A and MW014. POC Wells MW121A and MW025, among others, were found with high nitrate concentrations. Finally, arsenic was detected with relatively high concentrations in Wells MW057A, MW075, and MW121A, among others. As noted in the Reclamation Plan, the groundwater was impacted by previous spills and leaks that occurred during plant operations. Cleanup of the groundwater continues in accordance with an interim groundwater corrective action program.

Seepage and drainage were monitored at six locations (2241 through 2246) in the western portion of the site. Water samples were collected quarterly during 2009. Uranium concentrations ranged from below 1 microgram per liter to 331 micrograms per liter. The licensee continues to recover seepage and drainage through the use of collection trenches, French drains, and recovery wells.

The corrective action monitoring program consisted of four trench locations (2224A, 2224B, 2247, and 2248) and two monitoring wells (MW095A and MW031). These six monitoring stations were located downgradient of the groundwater intercept trenches. The water samples were collected by the licensee at least quarterly, although monitoring

Location 2224B was dry during 2009. The licensee continued to recover potentially contaminated groundwater from the trenches during 2009.

The surface water was monitored annually at four monitoring stations (2201 through 2204). The most recent samples were collected during August 2009. The samples were analyzed for uranium, radium-226, radium-228, arsenic, and nitrate. None of the collected surface water samples exceeded the respective action levels.

License Condition 49.C requires the licensee to submit an annual groundwater report to the NRC. The most recent report was submitted to the NRC on March 18, 2010, just after the completion of the onsite inspection. The data that was reported to the NRC in the annual report were reviewed by the inspectors during the onsite inspection.

c. Environmental Monitoring Program

The licensee conducted air particulate, sediment, radon, and impoundment underdrain sampling. The inspectors reviewed the results of samples collected during 2009. In summary, no sample obtained by the licensee exceeded the respective action level or effluent concentration limit.

As part of its environmental monitoring program, the licensee maintained four perimeter air sampling stations. Ambient air was continuously sampled at these four stations. The filter media was exchanged weekly and was analyzed for gross alpha concentrations. During 2009, the highest sample result was 2.1 E-14 microcuries per milliliter with an NRC-approved action level of 4.5 E -14 microcuries per milliliter. In summary, all sample results were below the NRC-approved action level.

The environmental air sample filters were composited quarterly and analyzed for uranium, radium-226, and thorium-230 concentrations. During 2009, the thorium-230 sample results were less than 13-percent of the effluent concentration limit as specified in Appendix B to 10 CFR Part 20. The uranium and radium-226 concentrations were less than 1 percent of the respective limits.

Sediment samples were collected annually by the licensee at three river locations. The samples for 2009 were collected during August 2009 and were analyzed for total uranium, radium-226, and thorium-230 concentrations. The thorium-230 and radium-226 concentrations were less than 2 picocuries per gram and were comparable to background levels. Uranium concentrations in the sediment samples were at or below 1.32 micrograms of uranium per gram of sediment, with an established action level of 40 micrograms per gram.

Although radon sampling was not required by the license, the licensee elected to collect quarterly radon samples at eight onsite and fence line locations. Radon samples were collected at five fence line locations, the main gate, inside the raffinate bagging (laundry) building, and the yellowcake storage pad. The highest sample result, 12.5 picocuries per liter, was obtained inside the raffinate bagging building, a building located within the radiologically restricted area. In summary, the radon sample results for 2009 remained below the effluent concentration limit of 30 picocuries per liter.

Finally, the licensee conducted sampling of the lined impoundment leak detection systems in accordance with Section 5.2.4 of the license application. These underdrains

were sampled monthly for uranium and nitrate concentrations. At the time of the inspection, the licensee was monitoring five ponds—the four clarifier ponds and fertilizer Pond 5. No specific action levels have been established by the NRC for these samples, and the licensee has elected to use the information for trending purposes.

d. Ammonium Nitrate Fertilizer Distribution Program

Section 1.8 of the license application allows the licensee to use ammonium nitrate solution generated from onsite dewatering activities as fertilizer, subject to a number of limitations. The solution can only be used as fertilizer on crops grown for animal food or for seed production. The licensee is required by its license to submit an annual completion report to the NRC. The most recent report was submitted to the NRC on April 18, 2009. This report provided by the licensee discussed the results of 2008 growing season. During the 2008 growing season, the licensee applied 9.3 million gallons of solution on four tracts of land totaling 142.9 acres.

The license application specifies a limit of 700 pounds of nitrogen per acre. The application rate reported by the licensee ranged from 114.5 to 276.8 pounds of nitrogen per acre of land. The license application also specifies a radium-226 concentration limit of 2 picocuries per liter and uranium concentration limit of 0.1 milligrams per liter (100 micrograms per liter) of solution. The composite sample results obtained by the licensee indicated a radium-226 concentration of less than 0.1 picocuries per liter and a uranium concentration of 1.96 micrograms per liter.

The license application also specifies that the licensee will collect soil and vegetation samples from the fertilized areas. The sample results obtained by the licensee are reviewed by an agronomist who subsequently provides recommendations for the nitrogen application rates. Similar to the previous years, the 2008 vegetation samples continued to contain elevated molybdenum concentrations. However, the vegetation (hay) could still be consumed by animals but with specific dietary restrictions imposed.

4.3 Conclusions

The effluent and environmental monitoring programs were implemented in accordance with license and regulatory requirements. The sample results indicated that liquid and gaseous radioactive effluent releases were less than regulatory limits. Elevated concentrations of radioactive material continued to be identified by the licensee in selected groundwater monitoring wells. In response, the licensee continued to implement an interim groundwater corrective action program. The licensee continued to use ammonium nitrate solution as a fertilizer on land used to produce hay. The licensee implemented the fertilizer distribution program in accordance with license application requirements.

5 Low Level Radioactive Waste Storage; Inspection of Transportation Activities (84900, 86740)

5.1 Inspection Scope

The inspectors interviewed licensee representatives, toured the site, and reviewed applicable records to determine if the licensee had established and maintained an effective program for management and transportation of radioactive wastes.

5.2 Observations and Findings

The inspectors conducted site tours, reviewed records, and interviewed licensee personnel to ensure that the licensee continued to manage wastes in accordance with Reclamation Plan and license requirements. At the time of the inspection, the licensee was constructing Phase I of the disposal cell in accordance with the Reclamation Plan. The Phase I footprint is expected to cover approximately 138,000 square feet of land surface.

To support the Phase I construction activity, the licensee temporarily revised the access control requirements for construction workers and their vehicles. The Reclamation Plan requires the licensee to develop written procedures to describe specific radiation safety requirements necessary for tasks that involve radioactive material. The licensee developed a temporary operating procedure to change the access control requirements for the Phase I work area. The change was implemented during January 2010 after the temporary operating procedure was reviewed and approved by the licensee's plant review committee.

The boundary change allowed personnel and equipment to enter and exit the construction area without radiation protection staff having to conduct radiological survey scans of personnel, equipment, and vehicles. This change was implemented after the licensee had completed a radiological survey of the Phase I footprint and was determined that the area meets the release criteria for cell construction.

The licensee controlled the temporary boundary with physical barriers. Also, the licensee occasionally verified through radiological surveys that equipment and personnel were not cross-contaminating the Phase I construction zone with residual contamination from other areas of the site. The inspectors reviewed the temporary operating procedure, observed the boundaries, and interviewed site staff to confirm that the licensee was maintaining strict control over this temporary boundary change. The licensee plans to return the Phase I construction area to a radiologically restricted area once it has completed construction of the base of the Phase I cell and starts placing contaminated materials into this portion of the disposal cell.

License Condition 50 provides the requirements for removing, bagging, and storing the raffinate sludge. The inspectors conducted a review of the licensee's storage of bagged raffinate sludge. At the time of the inspection, the licensee had filled approximately 11,500 bags of sludge, and the bags were being stored on the former yellowcake storage pad. The inspectors toured the area where the bags were stored and concluded that the storage of the bags was being maintained in accordance with the license.

The inspectors conducted radiological surveys of the bagged material. The inspectors conducted the surveys using a Ludlum Model 2401-EC2 survey meter (NRC Meter 016294G, calibration due date of 01/4/11). With a background of approximately 0.01 milliRoentgens per hour, the bagged raffinate sludge measured up to 2 milliRoentgens per hour. These readings were consistent with licensee's measurements. Based on these measurements, the exposure rates did not meet the definition of a radiation area (greater than or equal to 5 milliRoentgens per hour); therefore, this area did not require posting as a radiation area.

No transportation activities have been conducted since the last inspection; therefore, this program area was not reviewed.

5.3 Conclusions

The licensee effectively implemented and maintained a program for monitoring and securing solid waste storage as required by the license.

6 Emergency Preparedness; Fire Protection (88050, 88055)

6.1 Inspection Scope

The inspectors reviewed the licensee's emergency preparedness program to determine whether the program was being maintained in a state of operational readiness.

6.2 Observations and Findings

The licensee maintained emergency response capabilities for two classes of incidents—spills of dry uranium and injury of personnel. Emergency instructions for these types of incidents were provided in the license's facility operating procedures. The licensee also maintained a procedure for regulatory and license reporting requirements. The inspectors confirmed during site tours that the licensee had equipment available for responding to an emergency, should one arise. In addition, the inspectors verified that the licensee's portable fire extinguishers, located in various areas in the facility, had been hydro-tested annually and were still within the allowed certification intervals.

6.3 Conclusions

The licensee maintained an emergency preparedness program that included instructions and equipments for responding to contamination spills and individuals who become injured at the licensee's facilities.

7 Onsite Construction (88001)

7.1 Inspection Scope

The inspectors observed onsite construction activities to determine if they were being accomplished in accordance with the NRC-approved Reclamation Plan, license conditions, and construction specifications.

7.2 Observations and Findings

License Condition 51 states that the licensee is authorized to implement the Reclamation Plan. The Reclamation Plan provides a description of how the onsite disposal cell will be constructed, including design specifications for cell construction, technical specifications for cell materials, and requirements for quality assurance testing. At the time of this inspection, the licensee was constructing the base of the Phase I portion of the disposal cell. The inspectors observed construction activities in progress and reviewed selected construction completion records.

The disposal cell is being constructed in three phases within the radiologically restricted area. Constructing the cell in phases allows the licensee to efficiently sequence the cleanup of the contaminated areas located within the footprint of the cell.

As required by the Reclamation Plan, the base of the cell was being constructed in four layers. From bottom to top, the four layers consisted of: (1) a clay liner with a minimum thickness of 3 feet; (2) a 6-inch-thick sand bedding layer containing the leak detection piping; (3) a 60-mil-thick high density polyethylene synthetic liner; and (4) an 18-inch-thick sand layer containing the leachate collection piping.

The following aspects of the Phase I work were reviewed and/or observed during the inspection: (1) cleanup and preparation of subgrade surfaces; (2) placement, compaction, and testing of clay layer; (3) placement of sand bedding layer; (4) installation of leak detection piping within the sand layer; (5) excavation of clay from the clay borrow area; (6) implementation of detailed requirements of the Technical Specifications; (7) results of base material testing; and (8) documentation of quality assurance logs for daily activities.

Based on the review and observation of the above aspects, the inspectors concluded that:

- As shown by the Phase I area subgrade surveys, only a couple small areas west of the large concrete pad area required minor excavation of contaminated material. These areas were appropriately backfilled with the same compacted clay material being used for the clay liner.
- Acceptable methods are being used in the construction and testing of the clay and sand bedding layers of the Phase I base.
- After final approval of the last lift for each area of the clay layer, the lift is being quickly covered (within 24 hours) with the sand bedding layer as required by the reclamation plan.
- Quality assurance testing is being acceptably conducted in accordance with Reclamation Plan requirements with regard to both the type of testing and the frequency of testing.
- The test results to date have shown that the clay layer for Phase I meets the specifications for gradation, plasticity index, permeability, and as-placed moisture and density.
- The daily logs are of appropriate detail and provide acceptable documentation of site activities.

The following observations were presented during the inspection to the licensee for its consideration:

- Although the technical specifications as approved do not include any gradation testing of the sand bedding layer, NRC staff recommended that a few gradation

tests be performed on the material being placed to verify that it meets the as-designed gradation requirements.

- NRC staff suggested that the licensee continue photographic documentation of key cell construction activities as the work progresses, for review during future inspections and for use in the final completion report. The NRC staff emphasized the need for photographs of contaminated equipment and structure disposal activities.

In addition, a geotechnical issue was raised during the inspection, not related to cell construction. While touring the site, an earthen dam was observed that was constructed on site about 19 years ago as part of site drainage control. The dam appears to meet the definition of a dam that should be included in the National Dam Safety Program, i.e., a dam that is either greater than 25 feet in height or impounding more than 50 acre-feet of liquid. The licensee acknowledged that this dam was not currently included in the National Dam Safety Program. NRC staff indicated they would discuss this issue with the NRC's dam safety program staff. These internal discussions may result in the inclusion of this dam into the safety program and result in future inspections of the dam itself. To support the NRC review of the status of this dam, licensee staff indicated that they would verify the dimensions of the dam and would report these findings to the NRC project manager. The results of this NRC review will be reported to the licensee at a later date under separate correspondence.

7.3 Conclusions

The licensee was constructing the onsite disposal cell in accordance with Reclamation Plan requirements.

8 **Exit Meeting**

The inspectors reviewed the scope and findings of the inspection during an exit meeting that was conducted at the conclusion of the onsite inspection on March 11, 2010. During the inspection, the licensee did not identify any information reviewed by the inspectors as proprietary.

SUPPLEMENTAL INSPECTION INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

John Ellis, President
Craig Harlan, Director of Regulatory Affairs
Rob Miller, Health Physicist, Consultant
Scott Munson, Environmental Manager
Billy Reid, Quality Assurance, Consultant
Clint Strachan, Principle Geotechnical Engineer, Consultant

INSPECTION PROCEDURES USED

IP 83822 Radiation Protection
IP 84900 Low Level Radioactive Waste Storage
IP 86740 Inspection of Transportation Activities
IP 87104 Decommissioning Inspection Procedure for Materials Licensees
IP 88001 Onsite Construction
IP 88005 Management Organization and Controls
IP 88025 Maintenance and Surveillance Testing
IP 88045 Effluent Control and Environmental Protection
IP 88050 Emergency Preparedness
IP 88055 Fire Protection

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

040-08027/1001-01 NCV Discovery of contaminated equipment in unrestricted area

Closed

040-08027/1001-01 NCV Discovery of contaminated equipment in unrestricted area

Discussed

None

LIST OF ACRONYMS

ALARA As Low As Reasonably Achievable
CFR *Code of Federal Regulations*
CR Condition Report
DAC-hours derived air concentration-hours
IP NRC Inspection Procedure
NCV Noncited violation
POC point-of-compliance