



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

October 14, 2020

Mr. John Ellis, President  
Sequoyah Fuels Corporation  
P.O. Box 610  
Gore, OK 74435

SUBJECT: SEQUOYAH FUELS CORPORATION - NRC INSPECTION REPORT  
040-08027/2020-002

Dear Mr. Ellis:

This letter refers to the routine, announced U.S. Nuclear Regulatory Commission's (NRC) inspection conducted on September 10 and October 5-7, 2020, at your Sequoyah Fuels Corporation site in Gore, Oklahoma. This inspection examined activities conducted under your license as they relate to public health and safety, the common defense and security, and to confirm compliance with the Commission's rules and regulations and the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, tours of the site, independent radiological measurements, and interviews with personnel.

The inspection included a confirmatory survey of three site areas. A confirmatory survey is a survey conducted by the NRC to verify the results of your final status survey. The confirmatory survey included measurement of ambient gamma radiation levels and collection of soil samples. The preliminary inspection findings were discussed with you and your staff at the conclusion of the onsite inspection on October 7, 2020. A final exit briefing will be held with your staff after the NRC's contract laboratory has analyzed the soil samples. No violations were identified and no response to this letter is required.

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

Should you have any questions concerning this matter, please contact Dr. Robert Evans, Senior Health Physicist, at (817) 200-1234 or the undersigned at (817) 200-1156.

Sincerely,

A handwritten signature in black ink, appearing to read "Heather J. Gepford". The signature is fluid and cursive, with a large loop at the end.

Heather J. Gepford, PhD, CHP, Chief  
Materials Licensing & Decommissioning Branch  
Division of Nuclear Materials Safety

Docket: 040-08027

License: SUB-1010

Enclosure:

NRC Inspection Report 040-08027/2020-002

cc: w/enclosure:

S. Munson, Sequoyah Fuels Corporation

M. Broderick, Oklahoma Department of Environmental Quality

J. Dayvault, Department of Energy

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

Docket No.: 040-08027

License No.: SUB-1010

Report No.: 040-08027/2020-002

Licensee: Sequoyah Fuels Corporation

Location: Gore, Oklahoma

Dates: September 10 and October 5-7, 2020

Inspectors: Linda M. Gersey, Health Physicist  
Materials Licensing and Decommissioning Branch  
Division of Nuclear Materials Safety

Robert J. Evans, PE, CHP, PhD, Senior Health Physicist  
Materials Licensing and Decommissioning Branch  
Division of Nuclear Materials Safety

Binesh K. Tharakan, Senior Health Physicist  
Division of Nuclear Materials Safety

Chris D. Steely, Health Physicist  
Reactor Inspection Branch  
Division of Nuclear Materials Safety

Accompanied by: Mary Muessle, Director  
Division of Nuclear Materials Safety

Approved by: Heather J. Gepford, PhD, CHP, Chief  
Materials Licensing and Decommissioning Branch  
Division of Nuclear Materials Safety

Attachment: Supplemental Inspection Information

Enclosure

## **EXECUTIVE SUMMARY**

### Sequoyah Fuels Corporation NRC Inspection Report 040-08027/2020-002

The U.S. Nuclear Regulatory Commission (NRC) performed a routine, announced health and safety inspection on September 10 and October 5-7, 2020, at the Sequoyah Fuels Corporation facility in Gore, Oklahoma. The inspection included observations of site activities, independent radiation surveys, review of records, and interviews with site personnel. In summary, the inspectors concluded that the licensee was conducting decommissioning activities in accordance with regulatory and license requirements.

#### Closeout Inspection and Survey

- The inspectors reviewed the licensee's radiological survey design and sampling results for three areas located within the licensed boundary that were previously remediated. The licensee's records indicated that the licensee had designed and conducted final surveys in these areas in accordance with the NRC-approved Reclamation Plan, and all sample results were less than the limits specified in the Reclamation Plan. The licensee's records indicated that the areas had been effectively remediated. (Section 1.2.a)
- The inspectors conducted confirmatory surveys of the Pond 3 West, combination stream excavation, and area east of the disposal cell. The confirmatory surveys included measurement of ambient gamma radiation levels and collection of soil samples. The gamma radiation levels were less than the action level; the soil sample results were unavailable at the conclusion of the onsite inspection. The soil sample results will be presented to the licensee under separate correspondence. (Section 1.2.b)

## Report Details

### Site Status

Materials License SUB-1010, License Condition 51, requires the licensee to conduct decommissioning activities in accordance with the Reclamation Plan dated July 2008 as amended (Agencywide Documents Access and Management System [ADAMS] Accession Nos. ML080220345 and ML08196023). The Reclamation Plan provides instructions for dismantling and removal of systems and equipment, demolition of structures, treatment of sludge and sediments, remediation of contaminated soils, and treatment of wastewater. Consistent with the Reclamation Plan, almost all waste material from decommissioning activities will be placed in an onsite engineered cell for permanent disposal.

Since the last inspection, conducted in March 2020 (ADAMS Accession No. ML20094H092), the licensee continued to conduct decommissioning activities in accordance with the Reclamation Plan. The activities completed or in progress since the last inspection included construction of the final cover on the side slopes of the disposal cell, construction of the apron bench on the western side of the cell, raising of the storm berm within the cell to accommodate more material for disposal, and decommissioning the former switchyard area.

At the time of the inspection, three areas had been remediated and were ready for the NRC's confirmatory surveys including the former fertilizer Pond 3 west, combination stream area, and a strip of land located on the eastern side of the disposal cell. The licensee also continued to manage wastewater in accordance with site procedures.

## **1 Closeout Inspection and Survey (Inspection Procedure 83890)**

### **1.1 Inspection Scope**

The inspectors reviewed the licensee's final surveys of three areas to ensure that the surveys were conducted in accordance with Reclamation Plan requirements. The inspectors also conducted independent confirmatory surveys to verify that the surveyed areas had been decontaminated to acceptable radiological levels as stipulated in the NRC-approved Reclamation Plan.

### **1.2 Observations and Findings**

#### **a. Review of Final Status Surveys**

At the time of the inspection, the licensee had remediated three areas that may be backfilled or recontoured as part of decommissioning. The licensee conducted radiological surveys to demonstrate that the areas met the cleanup criteria as provided in Section 3.2.2 and Table 3-1 of the Reclamation Plan. The licensee's surveys were conducted using the guidance provided in NUREG-1575, Revision 1, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)". The licensee's surveys consisted of measurements of ambient gamma radiation levels and collection of soil samples. The inspectors reviewed the licensee's survey results for the three areas, to ensure that the licensee sufficiently demonstrated that the cleanup criteria had been met prior to potential backfilling or regrading of the areas.

In accordance with Attachment B, "Final Status Survey," to the Reclamation Plan, Figure B-1, the radionuclide of concern for these three areas was natural uranium. The NRC-approved cleanup level for natural uranium is 100 picocuries per gram (pCi/g).

The first area was the former fertilizer Pond 3 West. The pond had a surface area of approximately 14,800 square meters (m<sup>2</sup>). This area was classified as a Class 3 area using the guidance provided in MARSSIM. The licensee conducted gamma walk-over surveys and collected soil samples from the area. In accordance with MARSSIM, the percent scan coverage was judgmental, and the soil sample density was calculated to be a minimum of 9 samples for the survey unit. Per site procedures, the licensee also was required to collect duplicate and replicate samples for measurement of sample precision and accuracy, respectively.

The licensee used an action level of three times background for the gamma walk-over surveys. Although the scan coverage was judgmental, in reality, the licensee scanned almost 100 percent of the area. Some elevated areas were identified and remediated, but no area exceeded the action level. The licensee presented final scan survey data to the NRC, and all survey results were essentially at background levels. The licensee collected 15 soil samples for comparison to the cleanup level. The licensee also collected two duplicate and replicate samples. All soil sample results were less than 3 pCi/g with a cleanup level of 100 pCi/g.

The second area was the combination stream excavation, an area located to the southwest of the disposal cell. This area was approximately 9,290 m<sup>2</sup> and was classified as a MARSSIM Class 1 area. The scan coverage was expected to be 100 percent. For Class 1 areas, the licensee calculated a sample density of 8 samples per 2,000 m<sup>2</sup> of surface area. The minimum number of soil samples to be collected was 38 samples.

After completion of all remediation efforts, the licensee conducted a gamma walk-over scan survey of the area. The scan coverage was noted to be approximately 100 percent of the surface area. The results were less than or equal to twice background. The licensee collected 47 soil samples plus 7 duplicate/replicate samples. All soil sample results were less than 7 pCi/g with a cleanup level of 100 pCi/g.

The third area was a section of land located east of the Phase III portion of the disposal cell. This area was approximately 6,200 m<sup>2</sup> and was classified as a MARSSIM Class 1 area. The minimum number of soil samples needed to be collected from this eastern area was 26 samples.

Per MARSSIM, the scan coverage for Class 1 areas was 100 percent. The licensee's scan coverage was essentially 100 percent coverage, and the results were at or less than two times background. The licensee collected 29 samples plus 4 duplicate/replicate samples. All sample results were less than or equal to 15 pCi/g with a cleanup level of 100 pCi/g.

In summary, the licensee's records indicated that the excavated areas had been effectively remediated. The licensee designed and implemented radiological surveys that met the intent of MARSSIM. The scan survey results were less than the action level, and the soil sample results were less than the cleanup level specified in the reclamation plan.

b. Confirmatory Surveys

The inspectors conducted confirmatory surveys of Pond 3 West, combination stream excavation, and area east of the disposal cell. The purpose of the confirmatory surveys was to confirm the effectiveness and accuracy of the licensee’s final status surveys relative to whether the areas met the acceptance criteria established in the Reclamation Plan. The confirmatory surveys included measurement of ambient gamma exposure rates and collection of soil samples.

The inspectors conducted the gamma scans using ambient gamma exposure rate instrumentation. The instruments included two Radeye SX survey meters coupled to SPA-3 probes (Serial No. 52210 with SPA-3 19212 and Serial No. 52198 with SPA-3 19211, both with calibration due dates of July 24, 2021); one Ludlum Model 18 survey meter with Model 44-10 probe (Serial No. 25504 with probe PR110268 with a calibration due date of November 26, 2020); and one Ludlum Model 19 microR survey meter (Serial No. 15530, calibration due date of July 21, 2021). The surveys were conducted on October 5-6, 2020.

Prior to conducting the gamma scan surveys, the inspectors measured the ambient background levels to establish action levels for the survey meters. The background measurements were recorded outside of the restricted area in the yard adjacent to the administrative building. Because the licensee’s action level was three times the background level, for consistency, the inspectors’ action levels were also set at three times the measured background levels. As summarized in Table 1 below, none of the survey measurements exceeded the action level of three times background.

Table 1: Scan Survey Results (in units of microRoentgen per hour or counts per minute)

NRC Meter	Serial Numbers	Background	Pond 3 West	Combination Stream Excavation	Area East of Disposal Cell
Ludlum 19	15530	9-11 µR/hr	10-13 µR/hr	8-14 µR/hr	10-15 µR/hr
Radeye SX with SPA-3	52210 19212	6 µR/hr	7-9 µR/hr	9-14 µR/hr	7-12 µR/hr
Radeye SX with SPA-3	52198 19211	6-7 µR/hr	7-9 µR/hr	9-12 µR/hr	8-11 µR/hr
Ludlum 18 with 44-10 probe	15504 PR110268	9,000-10,000 cpm	10,000-15,000 cpm	5,000-20,000 cpm	10,000-20,000 cpm

The inspectors also collected 12 soil samples from the three areas based, in part, on gamma scan survey results. The samples were submitted to the NRC’s contract laboratory for analysis of gamma-emitting radionuclides and for determination of total uranium concentrations. The soil results were not available at the end of the inspection period and will be presented to the licensee at a later date. When received, the inspectors will compare the soil sample results to the cleanup criteria provided in Table 3-1 of the Reclamation Plan.

In summary, the results of the gamma scan surveys for the three areas were less than the action level of three times background. The results of soil sampling will be presented to the licensee under separate correspondence at a later date.

### 1.3 Conclusions

The inspectors reviewed the licensee's radiological survey design and sampling results for three areas located within the licensed boundary that were previously remediated. The licensee's records indicated that the licensee had designed and conducted final surveys in these areas in accordance with the NRC-approved Reclamation Plan, and all sample results were less than the limits specified in the Reclamation Plan. The licensee's records indicated that the areas had been effectively remediated.

The inspectors conducted confirmatory surveys of the Pond 3 West, combination stream excavation, and area east of the disposal cell. The surveys included measurement of ambient gamma radiation levels and collection of soil samples. The gamma radiation levels were less than the action level; the soil sample results were unavailable at the conclusion of the onsite inspection. The soil sample results will be presented to the licensee under separate correspondence.

## **2 Exit Meeting Summary**

The NRC inspectors presented the preliminary inspection findings to the licensee's representatives at the conclusion of the onsite portion of the inspection on October 7, 2020. The final inspection findings will be presented to the licensee by telephone after receipt of the soil sample results collected as part of the confirmatory surveys. During the inspection, the licensee did not identify any information reviewed by the inspectors as proprietary.

**SUPPLEMENTAL INSPECTION INFORMATION**

**Partial List Of Persons Contacted**

Licensee Personnel

J. Ellis, President  
S. Munson, Manager, Safety, Health and Environment  
R. Miller, Contractor, RMA  
K. Schlag, Contractor, RMA

**Inspection Procedures Used**

IP 83890      Closeout Inspection and Surveys

**Items Opened, Closed and Discussed**

Opened

None

Closed

None

Discussed

None

SEQUOYAH FUELS CORPORATION - NRC INSPECTION REPORT 040-08027/2020-002  
 DATED OCTOBER 14, 2020

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