January 12, 2005

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

SUBJECT: SEQUOYAH FUELS CORPORATION - MATERIALS LICENSE NO. SUB-1010 - ENVIRONMENTAL ASSESSMENT OF RAFFINATE SLUDGE DEWATERING PROJECT (TAC LU0061)

Dear Mr. Ellis:

The U.S. Nuclear Regulatory Commission (NRC) has completed its review of the environmental aspects of Sequoyah Fuels Corporation's (SFC's) proposed Raffinate Sludge Dewatering Project for the SFC facility in Gore, Oklahoma. We have reviewed the original submittal of January 7, 2004, and supplements submitted by letters dated March 8, 2004, and May 19, 2004. We have prepared an Environmental Assessment (enclosed) that resulted in a finding of no significant impact.

We will publish our findings in the *Federal Register*, after which we will act upon your license amendment request. If you have any questions concerning this letter please contact me at (301) 415-6629 or via e-mail to mhf1@nrc.gov.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

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Sincerely,

/RA/

Myron H. Fliegel, Project Manager
Fuel Cycle Facilities Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Docket No.: 40-8027
License No.: SUB-1010

Enclosure: Request for Additional Information

cc: William Andrews, USGS
Patricia Ballard, NRMNC
Michael Broderick, OK DEQ
Kelly Burch, Esq., OK AG
Will Focht, OSU
Alvin Gutterman, Esq., Morgan Lewis & Bockius
Pat Gwin, Cherokee Nation
Jeannine Hale, Esq., Cherokee Nation
Craig Harlin, SFC
Jim Harris, USACE
Troy Poteete, Cherokee Nation
Charles Scott, USFWS
Rita Ware, EPA
Robert Welsh, OK DEQ
Kim Winton, USGS
Merritt Youngdeer, BIA

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DATE	1/ 11/05		1 / 12/05		1 / 12/05	

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ENVIRONMENTAL ASSESSMENT
FOR THE SEQUOYAH FUELS CORPORATION
REQUEST FOR AMENDMENT OF ITS LICENSE TO
AUTHORIZE A RAFFINATE SLUDGE DEWATERING PROJECT

INTRODUCTION

Sequoyah Fuels Corporation (SFC) requested U.S. Nuclear Regulatory Commission (NRC) authorization to dewater raffinate sludge currently stored in three lined impoundments on its Gore, Oklahoma site, and to store the bagged dewatered sludge on the Yellowcake Storage Pad, pending either disposal in an onsite cell proposed by SFC (NRC is separately reviewing the proposed cell as part of its review of SFC's Reclamation Plan) or transfer to an offsite licensed disposal facility. NRC staff reviewed the proposed Raffinate Sludge Dewatering Project and concludes that, with several conditions to be added to the license, it will be protective of public health and safety.

The SFC facility operated as a uranium conversion facility but has not operated since 1993. SFC submitted decommissioning plans for the site in 1998 and 1999 in accordance with subpart E of 10 CFR 20 (the license termination rule). In July 2002, the Commission determined that most of the waste material at the site can be classified as 11e.(2) byproduct material[(1)], allowing SFC to decommission the site under Appendix A to 10 CFR 40. In 2003, SFC submitted a Reclamation Plan that proposes collecting the contaminated soils and other materials on the site and permanently encapsulating the wastes in an onsite, above-grade disposal cell. The raffinate sludge will have to be cleaned up and properly disposed as part of the Reclamation Plan. In preparation for its proper disposal, the raffinate sludge must first be dewatered.

THE PROPOSED ACTION

The proposed action is to grant a license amendment that would authorize SFC to dewater raffinate sludge and temporarily store the dewatered sludge onsite before final disposition. The sludge dewatering is estimated to take 6 months to complete and the sludge would be stored for up to several years before it is permanently disposed of.

Raffinate sludge was produced, as a waste, during the operation of the SFC facility. Approximately 1,000,000 cubic feet of sludge, containing 15 to 20 percent solids, are stored in three hypalon-lined impoundments on the site (identified as the Clarifier Basin). The sludge contains various metals in addition to uranium, thorium, and radium and must be properly disposed of as part of SFC's reclamation of the site. A detailed description of the characteristics of the sludge is provided in Tables 1, 2, and 3 of Enclosure 1 to SFC's January 7, 2004 request.

The equipment needed consists of trailer mounted pressurized filter presses, feed pumps, and cake conveyors. The equipment will be provided by contractors and set up near the impoundments currently containing the sludge. Figures 3 and 4 of Enclosure 1 to SFC's January 7, 2004 request provide details of the proposed general layout of the facilities and

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(1) 11e.(2) byproduct material is material that meets the definition in section 11e.(2) of the Atomic Energy Act of 1954, as amended. It is "tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content."

equipment. Upon completion of processing of the raffinate sludge, the equipment will be disassembled, decontaminated, and released for unconditional use or stored onsite for future disposition or use.

The process would begin with sludge being slurried and pumped from an impoundment to feed tanks using a remotely operated, electrically powered dredge. There will be two 15,000 gallon feed tanks to hold the sludge prior to it being pumped batch-wise to the pressurized plate press filters. There will be two trailer-mounted, 100 cubic feet capacity, pressurized plate press filters.

The sludge will be injected into the plate press filter units until the filter chambers are filled with sludge and the feed pressure reaches 225 pounds per square inch above atmospheric pressure (psig). A variable flow pump will then maintain feed pressure at 225 psig until feed and filtrate flow from the filter unit ceases. The feed pumps will then be stopped and the dewatered sludge or filter cake removed. The filter cake produced will be a solid, moist product with 45 to 50 percent solids. Characteristics of the filter cake are given in Tables 1 and 4 of Enclosure 1 to SFC's January 7, 2004 request. The liquid (filtrate) removed from the sludge during the process will be returned to the impoundment.

The filter cake removed from the filter press unit will be carried by a conveyor belt to the bagging station which will be set up in the former laundry building, adjacent to the filter press area (see figure 3 of Enclosure 1 to SFC's January 7, 2004 request). The filter cake will be put into bags of woven polypropylene fabric, each approximately 3 feet by 3 feet by 4 feet high, with a 2200 pound capacity. Each bag will be weighed and numbered, and that information will be recorded. The bags will then be moved to temporary storage cells.

Temporary storage cells will be constructed to store the dewatered raffinate sludge prior to its final disposal in the onsite cell to be built by SFC or its removal from the site for disposal at an authorized facility. The temporary storage cells will be constructed on the Yellowcake Storage Pad, a concrete area adjacent to the area to be used to dewater the raffinate sludge (see figures 1and 3 of Enclosure 1 to SFC's January 7, 2004 request). The cells will be lined with 20 mil, high density cross-laminated polyethylene and covered with the same material. The cells will be vented to enhance further dewatering of the sludge by evaporation. Figure 6 of Enclosure 1 to SFC's January 7, 2004 request shows a cross section of a completed cell. Each cell will be approximately 30 feet wide and 150 feet long and hold about 1460 bags of dewatered raffinate sludge. SFC anticipates constructing 11 cells to hold all of the dewatered sludge.

There are two outlets that drain storm water from the Yellowcake Storage Pad but SFC has stated that the raffinate sludge will be placed only in the area that drains to the South Yellowcake Sump. Water in that sump is sampled prior to it being released and if it meets release criteria, it is discharged to the Robert S. Kerr Reservoir. If it does not meet the release criteria, it is pumped to the Emergency Basin for treatment and testing prior to release. In the event a precipitation event exceeds the capacity of the sump, it will overflow to an outfall which is continuously monitored and discharges to the reservoir.

THE NEED FOR THE PROPOSED ACTION

SFC's proposed reclamation plan, currently under review by NRC staff, calls for disposal of the raffinate sludge in the cell proposed to be built on site. SFC is also considering shipping the raffinate sludge off site for disposal at a facility authorized to accept and dispose of the

material. Under either option, the sludge must first be dewatered. In its current state as a sludge containing over 80 percent water, it could not be put into an onsite disposal cell. Transportation of the sludge, in its current state, for off site disposal, would be more difficult and expensive. Additionally, it would have to be dewatered at the disposal facility before it could be buried. The final disposition of the dewatered raffinate sludge will be addressed in the Environmental Impact Statement that is being developed to address the Reclamation Plan review and approval process.

ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

NUREG-1157 provides detailed descriptions of the SFC facility and the nearby environment. Additional descriptions can be found in several SFC documents including, *Sequoyah Fuels Corporation Facility Environmental Investigation Finding Report* (1991), *Final RCRA Facility Investigation Report* (1996), and *Site Characterization Report* (1998).

The only environmental impact under normal conditions would be an increase in the radon concentration in the air at the site. The sludge contains radium which decays into radon, which is a gas that can be released into the air. Currently, the raffinate sludge is stored in three lined impoundments. The water in the impoundments acts to limit the amount of radon that escapes from those ponds to the atmosphere. After dewatering, the raffinate sludge will be stored in bags of synthetic woven fabric on the Yellowcake Storage Pad. The bags will be stacked in cells and covered with polyethylene liner material, but the cells will be vented, so some radon will escape to the air.

The licensee analyzed the increase in radon concentration at the nearest restricted area fence. Using a conservative analysis, the licensee calculated the average increase in radon concentration at that point, assuming the wind is always blowing in that direction. The concentration was calculated to be 0.3×10^{-10} micro Curies per milliliter (µCi/ml), which is well below the effluent concentration limit of 1×10^{-10} µCi/ml in 10 CFR Part 20.

The potential for other releases of contaminated material to the environment under normal conditions is minimal. The staging area for the dewatering of the raffinate sludge is configured such that water will drain back into the lined impoundments. Thus, in the event of a spill, contaminated material will flow back to the lined impoundments and not be released. The temporary storage cells will be lined and covered with 20mil, high density polyethylene. There is, therefore, little potential for contaminated material to be released from the storage area during normal conditions, including precipitation events. Additionally, as the staging area is paved (and drains to the lined impoundments) and the bags of dewatered raffinate sludge will be stored on polyethylene liner material on a concrete pad, the potential for contaminated effluent to seep into the ground water is minimal. Furthermore, the licensee will be required to establish a procedure to ensure that the temporary cell covers are periodically inspected and repaired, if necessary, and that liquid is not ponding inside the cells.

The staff considered the potential of releases to the environment due to adverse meteorological conditions. Because of the weight of the filled bags (up to 2200 pounds), dispersal of the dewatered sludge by high winds, other than tornados, was not considered credible. The probability of a tornado strike at the specific location where the bags are stored is 1.66×10^{-3} in any one year (about a 1 in 600 chance). Thus, the potential for windborne dispersal of contaminated material is minimal. The licensee analyzed the consequences of a tornado touching down on the Yellowcake Storage Pad, where the bags of dewatered raffinate sludge

will be stored and concluded that some of the contaminated sludge would be dispersed from the bags. However, the analysis indicated that it is unlikely that the contaminated material would be carried more than 120 feet from the perimeter of the cell. Therefore, in the unlikely event of a tornado strike during the period that the raffinate sludge is temporarily stored, SFC would be able to clean up any sludge dispersed by the tornado.

The licensee analyzed the effects of a 100-year precipitation event, which would drop 9.5 inches of rain in a 24-hour period. All of the runoff from the processing area would be contained in the lined impoundments and would thus not be released to the environment. The licensee also considered the potential for a significantly larger precipitation event to overflow the impoundments and release contaminants from the impoundments to the Illinois River and Robert S. Kerr Reservoir. However, the rainfall needed to overflow the impoundments would provide sufficient dilution to reduce the concentration of radioactive constituents released to orders of magnitude below the limits for continuous (as opposed to a rare, short duration event) release.

The licensee also analyzed the potential for a storm to release contaminants from the dewatered raffinate sludge that will temporarily be stored on the Yellowcake Storage Pad. Because the temporary storage cells will be lined and covered, there is little potential for contaminated material to be released from the storage area during precipitation events. An analysis was performed of the consequences of a spilled bag of raffinate sludge being on the concrete pad during a storm event. Because of the dilution provided by the storm runoff, the calculated concentrations of radioactive materials released to the reservoir were within regulatory limits.

The staff's conclusion is that under normal circumstances there will be no measurable releases of contaminants to the reservoir and that there are no credible scenarios that will result in more than minimal releases to the reservoir.

NRC has found no other current or planned activities in the area that could result in cumulative impacts.

ENVIRONMENTAL IMPACTS OF ALTERNATIVES TO THE PROPOSED ACTION

SFC investigated several processes for removing excess water from the raffinate sludge and chose pressurized plate press filtering, as providing the best cost-performance option. The impacts for the several processes would be similar.

An alternative to the proposed action would be for the staff to deny the licensee's request. The licensee would then be unable to dispose of the raffinate sludge in the proposed onsite cell and may not be able to ship it off site for disposal at a licensed facility. Thus, the raffinate sludge would remain in the ponds indefinitely and the site could not be completely remediated and transferred to a long-term custodian for perpetual surveillance and maintenance.

CONCLUSION

The NRC staff has concluded that the proposed action, to dewater existing raffinate sludge and temporarily store it in lined and covered cells, will result in minimal environmental impacts. Radon levels will be increased but will remain well within regulatory limits. In addition, there is

the potential, under unusual conditions (e.g., during a severe storm), of releasing small amount of contaminants in low concentrations, to the Robert S. Kerr Reservoir.

The NRC staff has prepared this environmental assessment in support of the proposed action to amend NRC license SUB-1010. On the basis of this environmental assessment, NRC has concluded that there are no significant environmental impacts and the license amendment does not warrant the preparation of an Environmental Impact Statement. Accordingly, it has been determined that a Finding of No Significant Impact is appropriate.

AGENCIES AND PERSONS CONSULTED

The Oklahoma Department of Environment Quality and the Cherokee Nation were consulted. Pre-decisional copies of this Environmental Assessment were forwarded to both on December 6, 2004. Neither had any comments.

NRC staff has determined that the proposed action and alternatives would not affect threatened or endangered species or their habitat. Likewise, the staff has determined that the proposed action is not the type of activity that would have an effect on historic properties. Therefore, consultation under Section 7 of the Endangered Species Act or Section 106 of the National Historic Preservation Act is not required.

REFERENCES:

Code of Federal Regulations (CFR), Title 10, Chapter I - Nuclear Regulatory Commission, Parts 20 and 51, revised as of January 1, 2004.

Roberts/Schornick and Associates, Inc., *Sequoyah Fuels Corporation Facility Environmental Investigation Findings Report*, July 1991.

Sequoyah Fuels Corporation, *License SUB-1010, Docket No. 40-8027*, *Final RCRA Facility Investigation Report*, October 14, 1996.

Sequoyah Fuels Corporation, *License SUB-1010, Docket No. 40-8027*, *Site Characterization Report*, December 15.1998.

Sequoyah Fuels Corporation, *License SUB-1010, Docket No. 40-8027, Amendment request for Raffinate Sludge Dewatering Project,* January 7, 2004, ML040150463.

Sequoyah Fuels Corporation, *License SUB-1010, Docket No. 40-8027, Amendment request for Raffinate Sludge Dewatering Project, Response to Request for Additional Information,* March 8, 2004, ML040760484.

Sequoyah Fuels Corporation, *License SUB-1010, Docket No. 40-8027, Amendment request for Raffinate Sludge Dewatering Project, Response to Request for Additional Information,* May 19, 2004, ML041610232.

U.S. Nuclear Regulatory Commission, NUREG-1157, *Environmental Assessment for Renewal of Special Nuclear Material License No. SUB-1010,* 1985.