January 26, 2005

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

SUBJECT: AMENDMENT 30 - SEQUOYAH FUELS CORPORATION - MATERIALS LICENSE NO. SUB-1010 - APPROVAL OF REQUEST TO AUTHORIZE RAFFINATE SLUDGE DEWATERING PROJECT (TAC LU0061)

Dear Mr. Ellis:

This letter is in response to Sequoyah Fuels Corporation's (SFC's) letter, dated January 7, 2004, requesting the U.S. Nuclear Regulatory Commission (NRC) to amend Source Materials License No. SUB-1010 to authorize implementation of SFC's proposed Raffinate Sludge Dewatering Project. Under the proposed project, SFC would dewater existing raffinate sludge in high pressure filter presses, package the dewatered sludge in polypropylene bags, and temporarily store the bags of dewatered sludge on the South Yellowcake Pad.

Based on its review of the request and its independent analysis, the staff concludes that the proposed project is acceptable with several conditions. These conditions were discussed with SFC's Vice-President, Craig Harlin, by telephone on January 10, 2005, and he agreed to them. The basis for the staff's approval is documented in a Technical Evaluation Report, provided as Enclosure 1. Additionally, the staff completed an Environmental Assessment (EA) which lead to a finding of no significant impact. A copy of the EA was sent to you on January 12, 2005. Your license has therefore been amended to include the authorization you requested. A copy of Amendment 30 of your license is provided as Enclosure 2.

If you have any questions concerning this letter please contact the NRC Project Manager, Dr. Myron Fliegel, 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/

Gary S. Janosko, Chief
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

Enclosures:
1. Technical Evaluation Report
2. License Amendment 30

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

January 26, 2005

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***See previous concurrence** ML050260564

OFC	FCFB		FCFB		FCFB		FCFB	
NAME	M. Fliegel*		B. Garrett		R. Nelson		G. Janosko	
DATE	1/24/05		1 /24/05		1/ 26 /05		1 / 26 /05	

OFFICIAL RECORD COPY

TECHNICAL EVALUATION REPORT
SEQUOYAH FUELS CORPORATION
REQUEST TO AMEND LICENSE TO AUTHORIZE
A RAFFINATE SLUDGE DEWATERING PROJECT

DATE: October 26, 2004

DOCKET NO. 40-8027

LICENSE NO. SUB-1010

LICENSEE: Sequoyah Fuels Corporation
P.O. Box 610
Gore, Oklahoma, 74435

FACILITY: UF_6 conversion plant, Gore, Oklahoma

PROJECT MANAGER: Myron Fliegel

TECHNICAL REVIEWERS: Jill Caverly, Flood Protection
John H. Lusher, Radiation Safety
Bill vonTill, Ground Water Protection

SUMMARY AND CONCLUSIONS:

Sequoyah Fuels Corporation (SFC) requested authorization to dewater raffinate sludge currently stored in three lined impoundments on the 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 (RSDP) and concludes that, with several conditions to be added to the license, it will be protective of public health and safety.

DESCRIPTION OF AMENDMENT REQUESTS:

By letter dated January 7, 2004, SFC requested authorization to implement its proposed RSDP. SFC supplemented its request with information provided by submittals dated March 8, 2004, May 19, 2004, and July 22, 2004. The RSDP would involve dewatering raffinate sludge using a pressurized filter press system. The raffinate sludge is currently stored in three lined impoundments. The dewatered raffinate sludge would be put into polypropylene bags and stored in temporary storage cells constructed on the Yellowcake Storage Pad.

EVALUATION:

Introduction

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. 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.

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 offsite 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 offsite disposal, would be more difficult and expensive. Additionally, it would have to be dewatered at the disposal facility before it could be buried.

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 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 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 polypropylene bags, 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. SFC will need to establish a procedure to ensure that no bag is filled to more than 2200 lbs. The bags will then be moved to temporary storage cells.

The bag proposed by SFC has been tested for various performance characteristics, including dropping and superimposed weight. Based on the testing, the bags can be stacked six high. Therefore, SFC will be required to limit the number of bags stacked on top of each other to six high.

Temporary storage cells will be constructed to store the dewatered raffinate sludge prior to its final disposal in the cell 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.

The staff reviewed SFC's proposal in the areas of radiation safety, including worker safety during normal operations and accidents, and the potential for offsite release of radioactivity; protection of radioactive material from precipitation events and the potential for release of liquid effluents, and protection of the ground water.

Radiation Safety

In its review of the radiation safety aspects of SFC's proposed RSDP, the staff considered worker safety and protection during normal operations and in the event of an accident and the potential for offsite radiological effects.

Worker protection is addressed in the licensee's Radiation Safety Plan (Plan) for Dewatering Raffinate Sludge (Attachment 3 to the licensee's report). The Plan describes radiation safety measures to protect workers during the dewatering project. The Plan is derived from the Radiation Safety Program (Program) of the Reclamation Plan, Sequoyah Facility, which has been found acceptable by the staff. In its most recent inspection (inspection report IR 040-08027/04-001, February 5, 2004), the staff found that SFC has been properly implementing the Program. In recognition that the amount of radioactivity, and therefore associated hazards, will be reduced as the project progresses, SFC states that the Plan may be modified to be commensurate with the activities being performed. SFC is required by License Condition (LC) 9.4, to follow the guidance set forth in Regulatory Guides 8.22, "Bioassay at Uranium Recovery Facilities," 8.30, "Health Physics Surveys in Uranium Recovery Facilities," and 8.31, "Information Relevant to Ensuring that Occupational Radiation Exposure at Uranium Recovery Facilities will be As Low As Reasonably Achievable (ALARA)," or NRC-approved equivalent. Additionally, health physics procedures are reviewed during inspections. SFC's Radiation Safety Plan content meets the requirements of LC 9.4. In accordance with Regulatory Guide 8.31, SFC will review and approve the Plan, and any revisions that are made during the project. Any such adjustment to the requirements of the Plan shall be made in a manner consistent with existing document control procedures. The Plan will be implemented directly and/or by additional written procedures or instructions. The SFC Manager, Health and Safety (Mgr. H&S) is responsible for implementation of the Plan. A contractor may implement the Plan with oversight by the Mgr. H&S. Additionally, the maximum worker dose rate measured during the testing phase (Attachment 4 to the licensee's report) in the first quarter of 2003, if projected to 500 hours (full time work in a quarter) would result in about 300 mrem total effective dose equivalent (TEDE), which is well below the limits established in 10 CFR part 20. Based on its review and inspection report IR04008027/04-001, the staff concludes that the licensee's proposed Plan meets all of the applicable requirements in 10 CFR part 20.

The licensee performed an accident evaluation (Attachment 2 to the licensee's report) to determine the significance of potential accidental releases of radioactivity and the resulting doses to workers. The evaluation was performed for an assumed spill of raffinate sludge from a rupture of the high pressure feed line to the filter press that released a cloud of sludge into the air. The staff concludes that the assumptions utilized in the calculations were conservative and therefore, the results presented are upper bounds of potential consequences of accidents during the raffinate sludge dewatering project. Even under these conservative assumptions, the total source term was very small, with a projected intake to the maximum exposed onsite individual of a very small fraction of the Annual Limit on Intake given in 10 CFR part 20. The intake, and hence dose, to an offsite individual would be even lower than for the onsite individual. As the onsite intake calculated under this scenario was negligible, no offsite calculations were performed. Based on its review, the staff concludes that the radiological consequences of potential accidents during the raffinate sludge dewatering project are acceptable.

The licensee also considered the potential of offsite releases of radioactivity. During normal operation, the most significant atmospheric release pathway (the potential for liquid transport of contaminants is discussed in another section of this report) that could result in offsite contamination is that resulting from radon emanation from the sludge. The licensee evaluated the increase in radon emanation expected as a result of dewatering and temporarily storing the packaged raffinate sludge on the Yellowcake Storage Pad. The staff reviewed the assumptions made in the analysis and concludes that they are conservative. The licensee calculated the maximum concentration of radon-222 at the nearest restricted area fence line to be $3x10^{-11}$ micro Curies per milliliter (µCi/ml). That value is well below the regulatory limit of $Ix10^{-10}$ µCi/ml in 10 CFR part 20, Table B. Additionally, radon monitors have been installed at the fence line and will be maintained during the time the raffinate sludge is being processed and stored. The radon monitors are passive monitors that will be changed out and evaluated quarterly. As a result of its review, the staff concludes that atmospheric releases of radioactive material as a result of the raffinate sludge dewatering project will be within regulatory limits.

Wind and Tornado Protection

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. Since 1955, there have been 33 tornados recorded in Sequoyah County. However, the probability of a specific location in the county being hit by a tornado in any one year is $1.66x10^{-3}$ (NUREG-1157). This is equivalent to a return period of about 600 years. Thus, it is unlikely that a tornado would affect the raffinate sludge during the period that it will be temporarily stored.

Additionally, SFC analyzed the consequences of a tornado touching down on the Yellowcake Storage Pad, where the bags of dewatered raffinate sludge will be stored (Attachment to SFC's July 22, 2004 e-mail). SFC's consultant, MMY Wind Engineers, performed assessments of tornado wind and missile impacts on the temporary storage cells. Based on the analysis, it is concluded that in the event of a tornado strike on a storage cell, the top cover would likely be blown off and some bags would be breached by missiles. Some of the contaminated sludge would be dispersed from the bags. However, the analysis indicates 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.

Flood Protection and Release of Liquid Effluents

In its review of the surface water protection aspects of SFC's raffinate sludge dewatering program, the staff considered the potential for runoff from storm events to result in the release of contaminants to the Illinois River and Robert S. Kerr Reservoir. The area where raffinate sludge will be processed and the area where the dewatered raffinate sludge will be stored drain to different locations, and were thus analyzed separately.

The raffinate sludge will be processed and dewatered in the processing area. The processing pad is an asphalt pad and slopes approximately 1.2 percent west toward the clarifier basin. The pad is bordered by the Laundry building on the north side and a 6-inch concrete curb on the south side. The storm runoff will be directed to the west by the slight slope on the pad to a transitional area with a 12 percent slope to the clarifier basin. The east side of the pad does not contain a berm because runoff will not flow in that direction.

The processing area was analyzed for its adequacy to contain runoff from the 100-year precipitation event. SFC calculated that the rainfall from an event with that return period is 9.5 inches in a 24-hour period. The staff concurs in the value for the 100-year event. In order to calculate runoff from the processing and storage pad areas, SFC modeled the runoff using the Soil Conservation Service's TR-55 run-off program. The parameters used in the determination of runoff volume include a runoff coefficient that allows for 99 percent of the rainfall to runoff and a Type II rainfall distribution. The staff concurs in the model and parameters used.

The runoff from the 9.5 inch rainfall event was calculated by SFC to be 15,953 cubic feet (cu. ft.) in 24 hours and will flow from the processing area to Clarifier Basin 1A. Clarifier Basin 1A is normally maintained with at least 12 inches of freeboard. The storage capacity of that basin, assuming an initial 12 inches of freeboard and an additional 4.9 inches of storage before overtopping, is approximately 48,667 cu. ft. The available storage, after accounting for direct rainfall on the basin, is in excess of 21,300 cu. ft. Therefore, SFC concluded that for the 100-year precipitation event, the combined runoff from the pad and the direct rainfall will be stored within Clarifier Basin 1A. The staff reviewed the SFC analysis and performed independent analysis and concurs in the SFC conclusion.

At elevation 561.45 feet, Clarifier Basin 1A will overflow to Basin 4A, which will eventually overflow to Basins 2A and 3A. The entire clarifier basin will store runoff to elevation 562.03 feet. At that elevation the clarifier basin will overflow. The low point of the embankment surrounding the clarifier basins is located along the western side near Clarifier basin 3A. At elevation 562.03 feet, the stored storm water will overflow to the surrounding area. The overtopping discharge will travel north between Pond 2 and the clarifer basins, turn to the west and flow toward the gully on the west side of Pond 2. The discharge will flow along the gully at the western section of the site flowing through Outfall 008 until it reaches Outfall 001. At Outfall 001, the flow will discharge off of the SFC controlled area to a natural gully that eventually will flow to the headwaters of the Robert S. Kerr Reservoir.

As the runoff from the processing area for the 100-year event will be easily stored in the clarifier basin, only a significantly larger event would cause the overtopping of the clarifier basin and release of contaminated storm water. SFC provided an analysis of a hypothetical overtopping event. The assumptions used in that analysis included a volume of approximately 115,000 cu. ft. of water overflowing the clarifier basin and the complete mixing of the rainwater with the liquid already in the clarifier basin. This mixing results in a dilution of approximately 4 compared to the concentrations initially in the basin.

SFC extrapolated the amount of runoff from the site for the 100-year precipitation event based on data acquired during previous storms. The total runoff estimated by SFC for the 9.5-inch 24-hour storm was approximately 799,000 cu. ft. SFC thus determined that the concentration of constituents from the clarifier basins would be further reduced by a factor of 8 based on the site runoff volume (115,000 cu. ft. of contaminated water mixed with 799,000 cu. ft. of clean water). The staff notes that this is a conservative estimate as the storm event necessary to result in 115,000 cu. ft. of contaminated runoff from the clarifier basin would be much more severe than the 100-year event and thus the amount of clean runoff available for dilution would be far greater than 799,000 cu. ft. The combined dilution of the concentration estimated by SFC was 32.

SFC stated that sampling data for the clarifier basins yielded concentrations of 86.1 μg/liter of Uranium and 25.9 pCi/l for Thorium-230. Thus, SFC estimated the concentrations of Uranium and Thorium-230 that would be discharged at outfall 008 as a result of the hypothetical overtopping of the clarifier basins to be 2.69 μg/liter and 0.81 pCi/l. Based on its review of the SFC analysis, the staff concurs in the estimated concentrations. The limit for continuous discharge of natural Uranium and Thorium-230 to surface water (10 CFR Part 20, Appendix B, Table 2) is $3x10^{-7}$ μCi/ml and $1x10^{-7}$ μCi/ml, respectively. The estimated concentrations discussed above are equivalent to $1.79x10^{-9}$ μCi/ml of natural Uranium and $8.1x10^{-10}$ μCi/ml of Thorium-230. Thus, the estimated concentrations of Uranium and Thorium that could be released as a result of an extremely rare precipitation event are more than two orders of magnitude less than that allowed to be continuously released. The staff, therefore, concludes that precipitation events do not pose a threat of release of excess concentrations of contaminated liquids to the reservoir from the processing area.

SFC also considered the potential for release of contaminated water from the Yellowcake Storage Pad, where the dewatered raffinate sludge will be temporarily stored until it is either disposed of in the proposed onsite cell or shipped offsite for disposal. The pad is an existing reinforced concrete slab previously used for the storage of yellowcake drums. The pad has an existing curb of approximately 5.5 inches. There are two outlets that drain the stormwater for the pad but SFC has stated that the raffinate sludge will be placed in the area that drains to the south sump. A 48-inch square grate is located in the southwestern corner of the storage pad and will transport most of the runoff from the storage pad. The grate will be modified prior to raffinate sludge storage by adding a box grate which is intended to protect against debris accumulation. The grated inlet connects to an 18-inch concrete diameter pipe, 80 feet in length that eventually outlets to a sump. SFC calculated the runoff volume during the 100-year precipitation event for the Yellowcake Storage Pad as 118,150 cubic feet (using TR-55) and the peak flow as 43.04 cubic feet per second (cfs). The pad can accommodate 51,000 cu. ft. of storage at elevation 565.35 feet before it overflows the curb. SFC stated that the pipe can accommodate the peak flow and thus that water will not overflow the curb. The staff performed a conservative analysis of the pipe's ability to carry the peak flow and, based on an inlet control condition with a 48-inch head and friction losses along the 80 foot length, concluded that it can accommodate a flow of at least 20 cfs. The staff performed an analysis of water level in the Yellowcake Storage Pad, assuming a maximum flow in the pipe of 20 cfs, and concluded that the 100-year precipitation event will not overflow the curb.

The runoff from the processing pad drains to the sump which offers little storage. SFC stated that a precipitation event of approximately 1 inch will cause the sump to overflow. All overflow from the processing pad sump will be discharged through Outfall 001 to the reservoir. Staff review of recent rainfall data for Tulsa indicates that precipitation events of greater than 1 inch occur approximately 8 times a year. Thus, a fairly common occurrence will be precipitation

events resulting in water that has flowed past the stored dewatered raffinate sludge and over the storage pad, flowing into the reservoir. Any contamination picked up will thus not be contained but could be discharged to the reservoir.

SFC stated that it was not likely that rainwater flowing through the Yellowcake Storage Pad will pick up contamination. The dewatered raffinate sludge will be stored on top of waterproof 20 mil, high density cross-laminated polyethylene liner material and covered with the same material. SFC stated that in the event of precipitation, the cover will be pulled in place on any cell not already covered. SFC also stated that all the temporary storage cells will be constructed above the 564 foot level, which would place them above the high water level on the Yellowcake Storage Pad during a 100-year precipitation event. The staff concurs that it is unlikely that any significant amount of contamination will be entrained in storm water runoff from the Yellowcake Storage Pad under normal circumstances. However, because of the frequent occurrence of storms that result in runoff from the Yellowcake Storage Pad discharging to the reservoir, SFC performed an additional analysis.

SFC assumed that the equivalent of one bag of dewatered raffinate sludge (2200 lbs.) was spilled on the pad, either prior to or during a storm. SFC further assumed that the storm water will carry 10 percent of this material to the sump where 50 percent will settle. The remaining (110 lbs.) will be carried with the storm water overflowing the sump, mixed with other storm water and discharged through Outfall 001. Based on past precipitation events between 0.75 and 1.25 inches, SFC estimated the total discharge through Outfall 001 for a 1 inch rainfall (this is the most critical event; a larger event would provide more dilution and a smaller event would not overflow the sump) to be about 194,000 cu. ft. (5,500,000 liters).

The average concentration of natural Uranium and Thorium-230 in the dewatered raffinate sludge (based on SFC measurements during the test phase of the dewatering project) is 19,400 μg/g and 16,200 pCi/g respectively. The average concentration in the storm water released through Outfall 001 during the 1 inch event (110 lbs. of dewatered sludge mixed with 194,000 cu. ft. of water) was calculated by SFC as 176 μg/l of natural Uranium and 147 pCi/l of Thorium, which are equivalent to 1.17×10^{-7} μCi/ml of natural Uranium and 1.47×10^{-7} μCi/ml of Thorium-230.

The estimated concentration of natural Uranium is below the limit for continuous discharge to surface water (3×10^{-7} μCi/ml), while that of Thorium-230 is somewhat above the limit (1×10^{-7} μCi/ml). However, as the limit is for continuous discharge and the combination of events considered (a storm dropping 1 inch of rainfall and the contents of one bag of dewatered raffinate sludge available on the pad) would be rare and the discharge would only last for a short time, the staff concludes that the release limits in Part 20 (which are annual average allowed concentrations) will be met.

As a result of its review, the staff concludes that potential releases of liquid effluents to the Illinois River and Robert S. Kerr Reservoir from the dewatering and temporary storage of raffinate sludge will be within regulatory limits.

Ground Water Protection

In its review of the ground water protection aspects of SFC's proposed raffinate sludge dewatering program, the staff considered the potential to contaminate ground water during the dewatering operations and during the period when the dewatered sludge will be stored on the Yellowcake Storage Pad.

During the dewatering process, leaks, spills, or accidents could occur. However, as discussed above, the area where the dewatering process will be conducted will be paved and will drain to the raffinate storage ponds. Thus, any liquids released during the dewatering process will return to the raffinate storage ponds and will not be available to infiltrate the ground and contaminate ground water. The staff concludes that ground water is adequately protected from leaks, spills, or accidents that could occur during the dewatering process.

The staff considered the potential for ground water to be contaminated from the dewatered raffinate sludge that will be temporarily stored on the Yellowcake Storage Pad. A site visit was made on March 16, 2004, in support of this review and other reviews associated with this site. Staff observed a test cell that the licensee had constructed on the Yellowcake Storage Pad. The test cell was a smaller version of the proposed temporary storage cells. The liner and cover appeared to work well and no signs of seepage were observed.

The licensee has proposed several actions to prevent groundwater contamination from the temporary storage cells to be constructed on the Yellowcake Storage Pad:

1. The dewatering process will remove liquids to the extent practicable thereby decreasing the ability for liquid wastes to migrate from the sludge. Most moisture will be retained by the absorptive capacity of the material.

2. The licensee has proposed that a liner (20 mil, high density, cross-laminated polyethylene) and concrete will prevent seepage of any liquid. In addition, the licensee proposed to use the same 20 mil, polyethylene material as a cover to prevent infiltration of rain water.

3. This cell is proposed as temporary and the dewatered raffinate sludge will eventually be disposed of either in a final tailings cell or another suitable location.

4. The area of storage is on a concrete pad that was previously used as a yellow cake storage area. Drainage on the pad is designed to flow into surface impoundments onsite. Therefore, it is highly probable that should potential seepage leak from the liner, contamination would likely flow into surface impoundments rather than seep into groundwater.

However, in order to assure that the cover is fully protecting the raffinate sludge and that liquid is not ponding inside the temporary cells, the licensee will have to develop an inspection procedure prior to the construction of the temporary cells. The staff concludes that with an adequate inspection program, the ground water will be adequately protected from contamination during the temporary storage of the dewatered raffinate sludge.

Conclusion:

The staff determined that SFC's proposed RSDP will be protective of public health and safety with the following conditions:

* SFC must establish procedures to ensure that no bag is filled to more than 2200 lbs.,

* SFC limit the maximum number of bags that will be stacked to six, and

* SFC must establish an inspection procedure to ensure that the temporary cell covers are functional and that liquid is not ponding inside the cells.

RECOMMENDED REVISIONS TO THE LICENSE:

The staff recommends the addition of the following license condition:

50. The licensee is authorized to implement the Raffinate Sludge Dewatering Project, as described in its submittals dated January 7, 2004 and March 8, 2004, with the following conditions:

    a) the licensee must establish procedures to ensure that no bag is filled to more than 2200 lbs;

    b) the licensee must not stack filled bags of dewatered raffinate sludge more than six high; and

    c) the licensee must establish an inspection procedure to ensure that the temporary cell covers are periodically inspected and repaired, if necessary, and that liquid is not ponding inside the cells.

REFERENCES:

Harlin, Craig, e-mail, subject: “Re: Raffinate Sludge dewatering,” July 22, 2004, ML042080329.

Harlin, Craig, e-mail, subject: “Re: Sequoyah Fuels: raffinate amendment-additional surface water questions,” August 4, 2004, ML042300483.

Harlin, Craig, e-mail, subject: “Questions on Raffinate Sludge Amendment,” August 5, 2004, ML043100346.

Reid, Billy W., e-mail, subject: “Response to Questions,” August 23, 2004, ML042510297.

Reid, Billy W., e-mail, subject: “Response to E-Mail Dated 091304,” September 23, 2004, ML042750148.

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