

October 31, 2003

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

SUBJECT: SEQUOYAH FUELS CORPORATION - MATERIALS LICENSE NO. SUB-1010 -  
REQUEST FOR ADDITIONAL INFORMATION - GROUND WATER  
MONITORING PLAN (TAC # L52529)

Dear Mr. Ellis:

The U.S. Nuclear Regulatory Commission (NRC) has completed its initial review of your June 12, 2003, submittal of Sequoyah Fuels Corporation's (SFC's) ground water monitoring plan, required by license condition 49 of Materials License No. SUB-1010. Our review has identified deficiencies in the ground water monitoring plan; we will need the additional information identified in the enclosure, in order for us to complete our review. Within 30 days of this letter please either provide the requested information or a schedule to provide the information.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," 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> (the Public Electronic Reading Room).

If you have any questions concerning this letter, please notify me at (301) 415-6629 or e-mail at [mhf1@nrc.gov](mailto:mhf1@nrc.gov).

Sincerely,

**/RA/**

Myron H. Fliegel, Senior 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  
Craig Harlin, SFC  
Jim Harris, USACE  
Rita Ware, EPA  
Kathy Peter, USGS  
Troy Poteete, Cherokee Nation  
Charles Scott, USFWS  
Merritt Youngdeer, BIA

J. Ellis

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<b>OFC</b>	FCFB		FCFB		FCFB	
<b>NAME</b>	MFliegel		BGarrett		RNelson	
<b>DATE</b>	10/27/03		10/29/03		10/31/03	

**OFFICIAL RECORD COPY**

**Sequoyah Fuels Corporation  
Ground Water Monitoring Plan  
Requests for Additional Information**

1. Groundwater contamination as a result of facility operations has not been fully characterized. Specifically, the horizontal extent and severity of nitrate in the terrace groundwater near mw107 and mw108 have not been defined and nitrate in the shallow bedrock down-gradient of mw095A and mw093a has not been adequately delineated. Also, arsenic down-gradient of mw095A in shallow bedrock has not been adequately delineated and arsenic in the area of mw058 in the terrace groundwater has not been adequately defined. Please provide a complete characterization of groundwater contamination.

**Basis:** NUREG-1620 Section 4.1.3 (page 4-13) describes NRC guidance relating to defining the extent of groundwater contamination. An adequate groundwater monitoring program cannot be properly developed until groundwater contamination has been fully defined vertically and horizontally.

2. SFC has proposed a groundwater protection monitoring plan for both existing contamination and the new proposed tailings cell. The groundwater protection monitoring plan for the new cell should be omitted from this request and moved into SFC's proposed reclamation plan amendment.

**Basis:** Separating the groundwater compliance monitoring plan for existing contamination from the groundwater detection monitoring plan for the proposed new cell is necessary due to potential changes in location and design of the new cell, adequate groundwater monitoring for existing groundwater contamination, and potential groundwater contamination of the new cell.

3. Data from various site characterization efforts indicate that a number of potentially hazardous constituents have been detected in the subsurface such as uranium, thorium-230, radium-226, nitrate, fluoride, antimony, arsenic, barium, beryllium, cadmium, cobalt, copper, chromium, lead, molybdenum, manganese, nickel, selenium, thallium, vanadium, zinc, PCBs, and other volatile organic compounds. SFC has only included uranium, arsenic, nitrate, and fluoride as potential hazardous constituents. Please provide justification for excluding the other constituents as hazardous constituents per 10 CFR Part 40, Appendix A, Criterion 5B(2), or add them to the list.

**Basis:** Per 10 CFR Part 40, Appendix A, Criterion 5B, and NUREG-1620 Section 4.2.3., hazardous constituents entering the groundwater must be identified.

4. Groundwater protection standards must be proposed for each aquifer unit that has been impacted or has the potential to be impacted by existing contamination due to facility activities. SFC has identified arsenic, natural uranium, nitrate, and fluoride as constituents of concern (COCs); other constituents also need to be assessed per item #3 above. Arsenic is the only COC that has a proposed groundwater protection standard. Please provide groundwater protection standards for each aquifer unit and each hazardous constituent.

**Basis:** Per 10 CFR Part 40, Appendix A, Criterion 5B(5), groundwater protection standards may be either:

- a) Commission approved background concentrations.
- b) Maximum concentration limits as given in Appendix A, Criterion 5C.
- c) Alternate concentration limits.

5. It has been well documented from previous reports that groundwater contamination as a result of facility operations already exists. Therefore, the groundwater monitoring plan must be developed as a compliance and corrective action monitoring program per 10 CFR Part 40, Appendix A, Criterion 7A, not a detection monitoring program. Compliance monitoring wells must be proposed for each aquifer unit within the plume. Because contamination is already present, compliance or corrective action monitoring wells should be located at the highest concentration wells within each definitive source area in each separate aquifer and throughout the plume. Parameters for compliance should be based on that particular source. Adequate monitoring well coverage is needed to monitor the highest concentrations of a particular contaminant plume, the movement of that plume over time and distance, corrective action performance, and the area directly down gradient from the furthest migration point. In addition, contamination migration along discontinuities (drainage trenches or channels) should be discussed in the groundwater monitoring plan and sampling points added within these features to account for non-uniform groundwater flow at the site and interim corrective action performance. Also, a background well is needed for the aquifer unit Shale 2.

Review of the proposed monitoring wells indicates that coverage to address the above mentioned goals is inadequate. In addition, due to the nature of groundwater contaminant migration, sampling points must also be proposed at springs where groundwater seeps out of the drainage paths as well as several surface water sampling points. Please revise the plan to provide adequate groundwater monitoring.

A map (or maps) that clearly illustrates the proposed compliance or corrective action monitoring wells, discontinuities, spring and surface water sampling points, proposed abandoned wells, and background wells is needed after the revisions are made. This map should also illustrate the contaminant plumes.

**Basis:** All points within the plume need to be compliance monitoring wells or corrective action monitoring wells. 10 CFR Part 40, Appendix A, Criterion 7A, states that “once ground-water protection standards have been established pursuant to paragraph 5B(1), the licensee shall establish and implement a compliance monitoring program. The purpose of the compliance monitoring program is to determine that hazardous constituent concentrations in groundwater continue to comply with the standards set by the Commission. In conjunction with a corrective action program, the licensee shall establish and implement a corrective action monitoring program. The purpose of the corrective action monitoring program is to demonstrate the effectiveness of the corrective actions.”

NUREG-1620 section 4.4 outlines the staff's guidance for compliance monitoring programs. In order to protect human health and the environment from groundwater contamination, ground water monitoring plans must be able to detect contamination prior to any potential exposure, monitor corrective action performance, and monitor plume movement over time and distance.

6. Frequency of monitoring should be adequate to accomplish detection of contamination prior to any potential exposure, monitor corrective action performance, and monitor plume movement over time and distance. SFC must provide a basis for any frequency longer than quarterly sampling. Once the above items have been addressed, SFC should re-evaluate the frequency of sampling for the proposed sampling points. SFC can propose different sampling frequencies for some wells, as in Table 4 of the Groundwater Monitoring Plan, but sampling frequencies longer than quarterly must be justified.

**Basis:** NUREG-1620, section 4.4, outlines the staff's guidance for compliance monitoring programs. In order to protect human health and the environment from groundwater contamination, groundwater monitoring plans must be able to detect contamination prior to any potential exposure, monitor corrective action performance, and monitor plume movement over time and distance.