

PDR 28

MAR 1 1991

In Reply Refer To:
License: SUB-1010
Docket: 40-8027/90-07

Sequoyah Fuels Corporation
ATTN: Reau Graves, Jr.
President
P.O. Box 610
Gore, Oklahoma 74435

Dear Mr. Graves:

This refers to the onsite inspection conducted November 15-16, 1990, and January 16-18, 1991, and the in-office reviews of activities authorized by NRC Source License SUB-1010 and the Order Modifying License (Order) issued on September 20, 1990. These inspections were related to the identification of environmental contamination under the main process building, and the results of these inspection activities were discussed with you and members of your staff on November 16, 1990, and January 18, 1991.

NRC acknowledges that Sequoyah Fuels Corporation (SFC) devoted significant resources to comply with the conditions of the Order, and all of the actions taken in response to the Order adequately complied with the conditions of the Order. NRC also acknowledges that these actions went beyond the requirements of the Order as SFC implemented a site-wide discovery program in October 1990. NRC understands that this effort is expected to be completed in the summer of 1991, and the actions related to this program have been aggressive.

The preliminary results of the site-wide discovery program have indicated significant environmental contamination on the SFC site. Although some quantities of licensed material have migrated outside the restricted area in the ground water and in the surface soils, current data does not indicate that licensed materials have migrated beyond SFC's property boundary. SFC appropriately responded to this matter by immediately implementing a ground-water corrective action program and a soil sampling program. Based upon the results of these programs, some form of further remediation efforts may be required in the future.

NRC reviews of the monitor well program, as described in the SFC license, indicate that several wells lack adequate completion data and therefore may be yielding information that is misleading. NRC reviews also indicate that the monitor well program described in the license is inadequate to detect the recently discovered environmental contamination. SFC has committed to submit to NRC a ground-water monitoring program for incorporation into the license once data has been evaluated from the current discovery effort.

RIV: ~~WFE~~
GKornhaski:lm
2/28/91

NMLS ~~hnd~~
GMVasquez
3/1/91

C:NMLS ~~hnd~~
WLFisher
3/1/91

~~DD DRSS
LAVandell
/91~~

D:DRS
ABBeach
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IE-07
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NRC reviews of the surface water monitoring program indicated that poor quality waters are released off-site from surface water impoundments by slowly bleeding them with good quality waters in the combination stream. This practice does not indicate a program that has incorporated the as low as reasonably achievable (ALARA) concept. Although it is recognized that SFC has reduced the total quantity of licensed materials released through the combination stream in the last year, SFC has not yet reviewed other alternatives to merely diluting these waters.

During these NRC reviews, it was obvious that many managers and members of the SFC staff that were interviewed were aware that, because of previous operational practices, the ground under the buildings and around the site was contaminated. Several managers and members of the staff were also aware that licensed material in the ground could migrate through the ground, both vertically and horizontally. However, despite the information that was known, SFC appears to have failed to evaluate all releases from the facility to demonstrate compliance with 10 CFR 20.106. This was identified as an apparent violation of 10 CFR 20.201(b).

The inspector also noted that environmental samples with less than the 225 micrograms per liter ($\mu\text{g}/\text{l}$) of uranium were routinely disposed of in the laboratory sink that discharges to a holding tank and leach field. As of the date of the inspection, SFC had not evaluated the uranium concentration in the tank or the leach field. Because uranium may have concentrated above regulatory limits, this was identified as an unresolved item.

NRC is concerned about the use of unlined storage ponds, as well as the leaking storage ponds at the site. SFC undertook a significant effort to eliminate environmental contamination through leaks in the floors and sumps. However, a potentially larger source of licensed materials, in direct hydraulic contact with the formations, is associated with the use of these unlined ponds. It is reasonable to suspect that licensed materials are continuously being released into the underlying strata. These releases into the ground do not indicate a program that has incorporated the ALARA concept. NRC understands that the discovery program will quantify the amount of environmental contamination from these ponds, and that based on that data, SFC will evaluate available options. NRC expects SFC to perform timely evaluations and implement a solution that more completely incorporates the ALARA concept.

The enclosed copy of our inspection report also identifies other areas examined during the inspection. Within these areas, the inspection consisted of selective examination of procedures and representative records, interviews with personnel, independent measurements, and observations by inspectors.

In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC Public Document Room.

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

Original Signed By:

A. B. BEACH
A. Bill Beach, Director
Division of Radiation Safety
and Safeguards

Enclosure:
Appendix - NRC Inspection Report
40-8027/90-07

cc:
Oklahoma Radiation Control Program Director

Native Americans for Clean Environment
P.O. Box 1671
Tahlequah, Oklahoma 74465

bcc:
DMB - Original (IE-07)
RDMartin
ABBeach
LAYandell
MRodriguez, OC/LFDCB (4503)
WLFisher
CLCain
GKonwinski
GMVasquez
NMSIS
MIS System
RIV Files (2)
RSTS Operator
REHall, URFO

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 40-8027/90-07

License: SUB-1010

Docket: 40-8027

Licensee: Sequoyah Fuels Corporation (SFC)
P.O. Box 610
Gore, Oklahoma 74435

Facility Name: Sequoyah Facility

Inspection At: Gore, Oklahoma

Inspection Conducted: November 15-16, 1990, and January 16-18, 1991

Team Members:

Gary R. Konwinski
Gary R. Konwinski, Project Manager, Uranium
Recovery Field Office, Region IV

2-28-91
Date

for William L. Fisher
G. Michael Vasquez, Health Physicist, Nuclear
Materials Licensing Section, Region IV

3/1/91
Date

Approved:

William L. Fisher
W. L. Fisher, Chief, Nuclear Materials
Licensing Section, Region IV

3/1/91
Date

Inspection Summary

Inspection Conducted November 15-16, 1990, and January 16-18, 1991
(Report 40-8027/90-07)

Areas Inspected: Special, announced inspection conducted November 15-16, 1990, and an unannounced inspection conducted January 16-18, 1991, and in-office reviews of licensed activities related to environmental protection and compliance with the Order Modifying License (Order). The inspection included an overview of SFC actions in response to the Order, an overview of the environmental monitoring program, licensee main process and solvent extraction building discovery program, surface water monitoring program, ground and surface water data review, and information available to SFC regarding environmental contamination under the main process building.

Results: Within the areas inspected, one apparent violation was identified:

- ° Failure to evaluate or measure, as required by 10 CFR 20.201(b), all releases from the facility to demonstrate compliance with 10 CFR 20.106. In addition, as indicated in Section 5.2, Chapter 5 of the SFC license renewal application dated August 23, 1985, as supplemented, SFC committed to an action level of 225 micrograms/liter uranium for environmental water samples such that for samples exceeding this value, SFC will "investigate and take proper mitigating measures if necessary." However, no investigation or proper mitigating measures were taken. It was noted that several licensee personnel and managers were aware that licensed materials were in the ground, and furthermore, it was known that this material could migrate through foundation and utility bedding material. (paragraphs 5 and 6)

One unresolved item was identified:

- ° Uranium concentrations above regulatory limits may have resulted from discarding environmental samples into a holding tank and associated leach field (through the laboratory waste sink). (paragraph 7)

Two open items were also identified:

- ° The licensee had not yet considered whether the ground-water monitoring program should monitor other trace metals that, over the years, may have concentrated in waste solutions moving with the surface water and or ground water. (paragraph 5)
- ° The licensee was unable to define a basis for the uranium environmental water action level of 225 micrograms/liter ($\mu\text{g}/\text{l}$). (paragraph 6)

In response to the Order, the licensee undertook an aggressive environmental discovery program of subsurface contamination under and around the main process building. Licensee actions went beyond the requirements of the Order as a site-wide environmental discovery program was initiated. This report documents those licensee actions in response to the Order and the preliminary findings of the discovery program.

Although these extensive actions are now being taken, interviews with SFC managers and SFC staff indicated that there was an awareness of the existence of environmental contamination beneath the main process and solvent extraction buildings. Many of these individuals were aware that this contamination could migrate into and through the ground into ground-water. However, no one interviewed was sensitive to the significance of this contamination nor to the amounts of materials released.

A review of the ground-water monitoring program that is described in SFC's license renewal request dated August 23, 1985, as supplemented, was determined to be inadequate to detect the environmental contamination at the site, the amount of licensed material that had been released, and the direction of ground-water movement. In addition, these wells had little or no completion

data, thereby indicating that this monitoring program has been and continues to supply data that may be misleading. However, SFC's aggressive environmental discovery program has installed 146 new wells that should be adequate to determine the extent of subsurface contamination. Once data has been obtained and evaluated, licensee representatives have indicated that an adequate ground-water monitoring program will be submitted for incorporation into the license.

In review of SFC's environmental program, two other concerns have been identified. The use of unlined ponds to hold contaminated waste solutions has resulted, and continues to result, in the unnecessary release of licensed materials into the environment. The practice of releasing contaminated waters into the combination stream at a slow rate, so that they are diluted with better quality waters, may have resulted in the unnecessary release of licensed material to the environment. These two concerns raise questions about the licensee's ALARA program.

SFC's procedures and practices for sampling and analyzing ground-water were also reviewed. In general, sample handling and analyses appeared adequate; however, the inspector identified one example of an inadequate laboratory procedure. Although the procedure required filtering, laboratory personnel were appropriately not filtering the water samples.

DETAILS

1. Persons Contacted

Sequoyah Fuels Corporation

- °*Reau Graves, President
- *Jim Mestepey, Senior Vice President
- *Mike Nichols, Manager, Health, Safety, and Environment
- *Carol Couch, Manager, Environment
 - Don Knoke, Manager, Facility Laboratory
 - Sue Smith, Supervisor, Waste Treatment and Solid Waste
 - Richard Parker, Manager, Maintenance (currently Manager, Operations)
 - Kenny Schlag, Hydrologist
- *Joe Bohanon, Quality Assurance (QA) Engineer

°Denotes attendance at exit interview on November 16, 1990.

*Denotes attendance at exit interview on January 18, 1991.

The inspectors also interviewed other Sequoyah Fuel Corporation (SFC) site personnel and consultants during the course of the inspection.

2. Introduction

As documented in the AIT followup inspection report (NRC Inspection Report 40-8027/90-05, dated November 20, 1990), on September 20, 1990, approximately 1 week after SFC's notification to NRC about the subfloor process monitor, NRC issued an Order Modifying SFC's license. The Order required SFC to: (1) ensure the integrity of the floor in the Main Process Building, minimize the process solutions on the floor, and repair sumps and floors as necessary; (2) characterize the quantity and location of licensed material under and around the main process building; (3) identify all potential pathways for migration of licensed material beyond the main process building; (4) examine present and past monitoring well data, determining whether the monitoring well program has been adequate to identify migration from the main process building; (5) determine whether licensed material has migrated beyond the restricted area; and (6) develop a plan to identify other locations on SFC property that could have environmental contamination. As indicated in SFC's October 16, 1990, letter to NRC, SFC was unable to meet the deadline specified in the Order for completing all of the environmental discovery actions due to circumstances beyond SFC's control. Therefore, the Region IV Regional Administrator relaxed the time limits on the Order. On December 18, 1990, SFC submitted the final report on the environmental characterizations related to the Order. In addition, SFC proceeded with actions beyond the Order's requirements by implementing an aggressive site-wide environmental discovery program.

3. Floor and Sump Integrity

To comply with the first condition of the Order, SFC stopped all activities that intentionally placed liquids in sumps and floors until the integrity of the sumps and floors were ensured. All sumps and floors in the main process building were then carefully inspected by members of SFC's engineering staff for breaches in integrity. Where defects or suspected defects were found, repairs were made and areas reinspected. Notably, SFC went beyond the Order by inspecting all floors and sumps in all buildings onsite, and then setting up a routine, proceduralized floor-and-sump inspection program. Typically, SFC plans to inspect floors and sumps on a quarterly, semiannual, or annual frequency.

4. Overview of SFC's Environmental Monitoring Program

Characterization of the site from a liquid monitoring perspective should consider both surface water and ground water. Surface waters at the site consist of precipitation, which creates runoff and directly enters the surface impoundments, and process waste water. These waters and naturally occurring subsurface waters make up the ground water that exists at the site.

The environmental monitoring program for the site consisted of ground water, surface water, soil, sediment, vegetation, and air monitoring at various site locations. Ground water and surface water environs will be the primary focus of this section of this report. Soil and sediment will be discussed briefly, while, vegetation and air, although indicators of potential radionuclide pathways, will not be discussed. The liquid environmental monitoring program, as described in Source License SUB-1010, consists of 14 surface water grab samples collected at various frequencies. Additionally, 73 ground-water monitoring wells are sampled. The monitor well locations, well designation, and area monitored are shown in Table 1. Of these wells, 10 monitor fertilizer spreading areas, 4 are plugged (and therefore monitor nothing), 28 monitor Pond No. 2, 19 monitor the lined raffinate storage ponds, and 12 are located in areas that monitor the restricted area boundary. There are many other wells on the SFC property that have been plugged relative to past operating practices or that remain open and are not monitored. These wells may or may not have been part of previous ground-water monitoring programs, but are not currently part of the environmental monitoring program specified in the license.

A review of Table 1 indicates that a wide variety of detail exists for the monitor wells that SFC is utilizing. SFC maintained detailed logs and thorough completion details for the majority of the wells associated with the raffinate ponds; fewer details were available for the wells associated with Pond No. 2. The 270 land application area had good well completion data available for the monitoring sites as did the wells associated with the Rabbit Hill fertilizer area. The majority of wells associated with monitoring the restricted area boundary had few or no completion details, and little or no information from boring logs.

The utilization of data from monitor wells, in the absence of completion details and logs of soil borings, has a high likelihood of yielding meaningless information. This was the case for many of the SFC monitor wells. Logs of the soil borings associated with the more recently completed monitor wells indicated that an interbedded sequence of shale and sandstone exists over the entire SFC site. It appeared that portions of the shales and sandstones act as aquitards while more highly fractured or less well cemented sequences of these same units function as aquifers. Therefore, to reliably determine solution movement, monitor wells should be completed in the poorly cemented sandstones as well as more permeable shales. From the data that existed in the SFC files, it was often impossible to determine completed intervals as well as the zones that are being monitored for many of the wells listed in the license. However, data contained in the files indicated that sufficient stratigraphic records exist to construct appropriate cross-sections of the site and choose meaningful completion zones.

In reviewing the environmental program, the inspector noted that as the SFC organizational structure existed, there was no one individual that had overall authority and responsibility for environmental monitoring of liquid effluents generated at the facility. The operations group, the staff reporting to Vice President of Business Development, and the environmental group share responsibilities for the monitoring, reporting, and acquisition of data. This arrangement appears to have caused some confusion as to the specific responsibilities of the various individuals.

5. Licensee Main Process and Solvent Extraction Building Discovery Program

A cursory review of monitor well locations described in the SFC license indicated that none were sufficiently near to the main process building to accurately characterize the extent of material migration. Therefore, after issuance of the Order, SFC immediately began an aggressive environmental discovery program. The licensee's discovery program adjacent to the main process building involved the completion of numerous monitoring wells and 14 hand auger penetrations. The monitoring wells were accompanied with boreholes which represented the initial discovery step to determine the underlying strata at the various locations. Where possible companion monitor wells were established in the shallow shale unit and the deeper sandstone units. Water levels as well as water quality data for uranium, nitrate, fluoride, and specific conductance were collected for wells established in the various strata. In addition to water quality data, information on soil uranium concentrations in the various strata was collected and compiled at 6-inch intervals. Eight monitor wells were completed around the solvent extraction building in a similar fashion to those completed near the main process building. These wells are also sampled for uranium, nitrate, fluoride and specific conductance.

As an analytical spot check on the uranium concentrations in the (surface) soil, an inspector collected seven surface soil samples along a draw from the main process building, past the emergency basin, and outletting near

the restricted area boundary. Uranium concentrations ranged from 23 picocuries per gram of soil (pCi/gm) near the restricted area boundary to over 11,000 pCi/gm near the emergency basin, with an average uranium concentration of 3,700 pCi/gm.

The licensee also completed 24 utility line excavations, discussed in NRC Inspection Report 40-8027/90-05, dated November 20, 1990. These excavations concentrated on utility lines, identified by the SFC engineering group, that either originated, terminated, or passed near the solvent extraction building or main process building. These excavations resulted in the installation of 16 concrete containment barriers and 14 collection sumps. The containment barriers were set into the surrounding bedrock and were designed to reduce or eliminate the amount of seepage that was traveling in the utility line bedding material. When containment barriers were installed, collection sumps were also placed in service. These sumps consisted of perforated pipe placed on the upgradient side of the containment barriers. The sumps in the solvent extraction yard were pumped on a weekly frequency. Seven sumps were also located outside the restricted area, and were pumped on an as needed basis. The volume and quantity of the recovered solutions were logged. This represents a form of corrective action which should be maintained to assure that releases from these points are in conformance with ALARA concepts.

Data collected from the various monitoring locations indicated that seepage waters from a combination of the solvent extraction building, main process building and other non-specified sources have been detected in both the shallow shale unit and the deeper sandstone strata. Elevated levels of uranium, nitrate, fluoride, and specific conductance had been noted to occur. During the period of September 10 to November 12, 1990, a total of 19,689 gallons of seepage waters had been pumped from these sumps, with uranium concentrations ranging from 3.7 $\mu\text{g}/\text{l}$ to 578,735 $\mu\text{g}/\text{l}$. All sump waters, except for the one that had the low reading noted above, had uranium concentrations that were elevated above the site background of 10 $\mu\text{g}/\text{l}$. As of January 16, 1991, over 500 pounds of uranium had been recovered from the sump waters.

Data associated with these recently completed monitor wells and utility trenches confirmed that licensed material and other process additives migrated beyond the restricted area boundary in two areas. The full extent of migration is not currently known. The potential for migration into other areas is currently under review. In the areas where migration beyond the restricted area had been confirmed, seepage recovery systems are either active or currently being constructed. A judgement on the success or failure of these recovery systems may take months before enough data has been obtained to make this determination.

One location where the licensee's program discovered that uranium had migrated to the unrestricted area was confirmed by elevated concentrations in the saturated bedding materials adjacent to the combination stream pipeline. The original excavation along the combination stream pipeline,

in the solvent extraction building yard, had indicated elevated uranium concentrations. As a result of this, SFC drilled into the pipeline bedding material that surrounded the combination stream piping. This drilling occurred outside the restricted area adjacent to the south yellowcake sump. Initial sampling at this site indicated a uranium concentration of 90,000 $\mu\text{g}/\text{l}$ (9,000 times the site background). Subsequent sampling has shown that uranium concentrations have stabilized at about 4,000 $\mu\text{g}/\text{l}$ (400 times the site background). To more fully explore the water quality and quantity in this area, SFC installed two additional wells in the pipeline bedding, a recovery well in the pipeline bedding near the yellowcake storage pad, and two wells downstream of the combination stream outfall. The wells downgradient of the yellowcake sump indicated uranium concentrations in the 100 to 300 $\mu\text{g}/\text{l}$ range (10 to 30 times the site background). The recovery well was installed in a location where uranium concentrations as of January 18, 1991, were 44,750 $\mu\text{g}/\text{l}$, and therefore appeared to be in a location where significant amounts of uranium may be recovered.

The water collection activities associated with the various sumps had created a depressed water surface in the shale materials. The depression encompassed the entire solvent extraction building area and extended roughly 200 feet to the north and south of the solvent extraction building. On the east side the depression extended under the western one-third of the main process building. The effect to the west was unknown because of the lack of data; however, monitoring data associated with the newly installed wells should provide information on the depressed water surface in this area.

To comply with another condition in the Order, SFC developed a facility-wide environmental investigation program. The program included plans to investigate 26 areas at the site to determine ground water and surface water impacts as well as the amount of various constituents that are in the soils at the site. The main process building and the solvent extraction building were Number 1 and Number 2 investigation priorities, respectively. Going beyond the Order, SFC began implementing this site-wide investigation program in October. With the monitoring network that had been implemented at the conclusion of this inspection, SFC had completed most of the drilling phase of the program. SFC made a significant effort to identify areas that are in need of investigation. SFC anticipated that the program and data collection associated with it will be completed in the early summer of 1991.

Work associated with the site-wide investigation program ultimately will involve the monitoring of 154 wells. At the conclusion of this inspection period, 146 out of 154 planned wells had been installed at the site in response to the facility-wide investigation plan. The planned well locations are as follows: 52 near the main process building, 8 near the solvent extraction building, 52 adjacent to the restricted area boundary, 34 inside the restricted area at various locations and (only) 8 from the monitoring program identified in the license.

The 146 ground-water monitoring wells appeared to have utilized appropriate completion and installation techniques. Licensee representatives indicated that the data collected from the wells will be used to characterize the volume and activity of licensed materials at the site, as well as to implement a defensible ground-water monitoring well program.

The inspector also reviewed the ground-water monitoring program, as described in the license, to determine its adequacy. Observation of the monitor well locations indicated that the raffinate ponds and the portion of the restricted area boundary near Pond No. 2 were adequately monitored. Furthermore, the quality and reliability of the monitor well completion data indicated that the raffinate ponds appeared to be adequately monitored. However, the main process area and the features located within the restricted area boundary were poorly monitored from a ground-water perspective. The east side of the restricted area boundary and, to a lesser extent, portions of the north and south sides of the restricted area boundary had no ground-water monitoring wells. Although the east and remaining portions of the north and south restricted area boundaries have numerous wells, these boundaries were not adequately monitored.

Thirty-nine of 73 wells, currently included in SFC's license, monitor either the restricted area or Pond No. 2. Of these 39 wells, 31 contained insufficient completion information, and therefore may be yielding data that is misleading.

SFC's ground-water monitor program, as described in its license appeared inadequate to identify the environmental contamination that exists at the facility, in light of the recent discoveries. The fact that SFC's environmental monitoring program was not adequate to identify releases from the facility, to demonstrate compliance with 10 CFR 20.106 was identified as an apparent violation of 10 CFR 20.201(b) (40-8027/9007-01). In addition, as denoted in Section 5.2, Chapter 5 of the SFC license renewal application dated August 23, 1985, as supplemented, SFC committed to an action level of 225 µg/l uranium for environmental water samples. SFC will, for samples exceeding this value, "investigate and take proper mitigating measures if necessary." However, SFC did not investigate and take proper mitigating measures. Licensee representatives stated that they plan to submit an adequate ground-water monitoring program for NRC review and incorporation into their license.

The 73 ground-water monitoring wells currently listed in the license are required to be sampled on a quarterly or monthly frequency depending upon the location of the well. However, some wells are sampled on both monthly and quarterly frequencies, depending upon the parameters. The water analysis generally consists of gross alpha and gross beta activity, fluoride, uranium, thorium-230, radium-226, nitrate, pH and conductivity. Considering the rate of fluid movement in the monitored formations, the sampling frequency appeared more than adequate for an appropriately

designed ground-water monitoring program. Due to the slow rate of ground-water movement at the site, a semiannual monitoring frequency could be justified. Such a frequency would collect a sufficient amount of data to allow SFC to accurately evaluate ground-water impacts. The parameters that are included in the routine analytical list are sufficient for determining ground-water movement. Without exception, fluoride, uranium, and nitrate were the parameters that became elevated when leakage took place. To a lesser extent, thorium-230 and radium-226 also became elevated.

There are several other trace metals that are known to exist in the yellowcake and slurry products that SFC receives. Considering the years of operation that have taken place and the extent of environmental contamination, there is a high likelihood that some of these trace metals may have become concentrated in the waste solutions which, in turn, may have moved with the ground water. The licensee had not yet considered whether the environmental program should consider monitoring these constituents in the surface water and ground water environments. This was identified as an open item pending further NRC review of the SFC ground-water monitoring program (40-8027/9007-03).

6. Ground-Water and Surface Water Monitoring Programs

Twenty surface water impoundments exist at the site. Construction features range from combination clay and synthetically lined systems with underdrain leak detection, to clay-lined impoundments, to unlined intermittent basins that on occasion receive various qualities and quantities of water. The surface water impoundments, and some of their characteristics, are compiled in Table 2. As can be seen from that table, 11 of the 20 surface impoundments are lined with either clay or clay and hypalon. In addition to the impoundments, there are several fluoride burial pits, two yellowcake sumps, and waste burial areas that are potential contributors of monitored constituents to the ground water. Additional contributions could result from contaminated surface water or surface contamination.

The numerous impoundments that are located on the site may have created a mound of ground water that would not have naturally occurred. This situation is difficult to confirm at this time because the subsurface stratigraphic control for the site and recent monitoring data associated with the recently completed wells have not been adequately characterized. Furthermore, many of the previous monitor wells associated with the impoundments that would have the ability to detect leaking solutions have incomplete or no completion details. Due to this, many of these impoundments may be leaking, but the leakage may not have been detected. The newly installed ground-water monitoring wells are expected to supply sufficient monitoring points to determine the contribution of the various ponds to the environment.

As discussed in Section 5 of this inspection report, SFC has committed to an action level of 225 μ g/l uranium for environmental water samples. Interviews with SFC personnel and a review of records indicated no knowledge of the basis for this number. Naturally occurring uranium concentrations in the site formations are consistently less than 10 μ g/l and therefore, any ground-water sample in excess of this threshold indicates uranium contamination. The inspector noted that numerous monitor wells are detecting uranium values in excess of the site background. If the ground water and surface water monitoring programs are to be meaningful, the monitored constituents must be compared to background, the Environmental Protection Agency (EPA) drinking water standard, or other meaningful values rather than to a 225 μ g/l action level which is currently utilized by SFC. The lack of an adequate basis for the established action level was identified as an open item pending further review by NRC (40-8027/9007-04).

Another concern identified by the inspector was that, based on interviews of the SFC operations staff, SFC often dilutes poor quality or contaminated waters with good quality, fresh waters, to ensure the NPDES permit concentrations are not exceeded. SFC normally discharged the contents of all site impoundments, with the exception of the ammonium nitrate storage ponds, from the site through the combination stream. This has included the waters from the sewage lagoon where the sludge has a uranium concentration of 12495 micrograms per gram (μ g/g). Other routine inputs to the combination stream include but are not limited to the burial pit sump, fluoride basins, emergency basin, north ditch, north and south yellowcake sumps, the incinerator, roof drains, and the fresh water pond. In aggregate, these sources have been managed to ensure that the NPDES discharge limits for uranium, nitrate, fluoride and pH are not exceeded.

Although it is possible that uranium concentrations similar to those of the sewage lagoon can be expected to exist in the North Ditch/Emergency Basin, SFC had not yet sampled those impoundments. These two impoundments warrant further study to determine the degree of transportation of licensed materials that is taking place.

This practice of diluting waters that may be in excess of NPDES discharge limits with fresh water has been an operational method that has taken place for a number of years. Although SFC has reduced the total quantity of material discharged from the site, the inspector noted that this practice is not consistent with the ALARA concept in limiting releases. When questioned, licensee representatives indicated that SFC had not reviewed other alternatives to handling or treating waters from these contaminated impoundments. The fact that SFC's waste handling program was not adequate to identify releases from the facility, to demonstrate compliance with 10 CFR 20.106 was an additional example of the apparent violation of 10 CFR 20.201(b). In addition, as denoted in Section 5.2, Chapter 5 of the SFC license renewal application dated August 23, 1985, as

supplemented, SFC committed to an action level of 225 µg/l uranium for environmental water samples. SFC will, for samples exceeding this value, "investigate and take proper mitigating measures if necessary." However, SFC did not investigate and take proper mitigating measures.

In summary, the surface water features at the site indicated that many process related solutions were discharged to unlined waste ponds. These solutions were either lost to the atmosphere by way of evaporation, seeped into the underlying formations, or discharged by way of the combination stream. With the exception of the five ammonium nitrate storage ponds and the four raffinate clarifier basins, the other site storage ponds are poorly isolated from the underlying strata. For the most part, direct hydraulic communication exists between all unlined impoundments, noted in Table 2, and the formations. Because of the geology of the area, it is reasonable to suspect that undetermined quantities of the solution pond contents are continually being released into the underlying strata. These releases indicate a program of solution discharge that has not incorporated the ALARA concept.

As part of the overall site investigation program, SFC recently implemented a surface water runoff investigation program that is designed to determine the quantities of the various constituents that are being transported at the site. Sampling occurred at 20 locations, and analyses were performed for pH, fluoride, nitrate, conductivity, and uranium. The sampling locations are strategically located around the site to isolate small watersheds within the SFC property boundary. This program has sufficient design detail to quantify nonpoint surface water contributions by watershed area and should define potential areas of surface water contamination.

7. Ground-Water and Surface Water Collection

The procedures associated with collection and preservation of environmental samples were reviewed during the inspection. The protocol for collecting samples indicated appropriate attention to detail. New, labeled containers were utilized to collect a representative sample volume for the desired analysis. The inspector observed that both SFC and contract personnel collect ground water and surface water samples and document appropriate information on the chain of custody form. This form and the samples were then taken to the environmental laboratory for analysis.

Although the sample collection and bookkeeping were well documented, the inspector noted that the SFC training merely consisted of on-the-job training. Although this training is appropriate, this alone might not ensure that SFC personnel are appropriately and uniformly trained for these tasks. The inspectors noted that SFC had not developed a list of standard elements to be included in this training nor a documentation process that indicated that all elements were completed for each individual involved in this program.

The inspector also reviewed laboratory procedures associated with sample preservation, preparation and analysis. These procedures indicated that standard methods were utilized. It was noted that Environmental Laboratory Procedure SOP-1, "Aqueous Sampling Receiving and Preparation," required that samples be filtered prior to analysis. This procedure also incorporated a chain-of-custody form that had been revised and was no longer used. Although SFC (correctly) did not filter the environmental ground-water samples, a procedure was not in place that accurately described the sample preparation technique nor utilized the correct chain-of-custody form. This situation was brought to the attention of the Manager, Environmental who committed to appropriately revising the procedure.

The inspector found the environmental laboratory orderly, clean, and well maintained. The flow of samples through the facility was well documented. Laboratory analysis techniques were well chosen, and documented for the desired analysis. The inspector noted that SFC did not use outside laboratories for quality control checks, but did run blanks and spikes with many of the routine environmental samples. Although verifying lab results with blanks and spikes is appropriate, it alone may not adequately demonstrate the accuracy of sample analysis. A quality control check would still be appropriate for occasional checks on SFC's environmental laboratory's analyses.

Following analysis, samples having uranium concentrations in excess of 225 µg/l action level were returned to the facility to be discarded. Those samples with uranium in concentrations less than the 225 µg/l action level were discarded into the laboratories waste sink which discharges to a holding tank and a leach field. Because there was no data available on the uranium concentrations in the holding tank or the leach field, and because the potential exists for concentrations of licensed materials above regulatory limits, this item was noted as an unresolved item (40-8027/9007-02).

8. Information Available to SFC Regarding Environmental Contamination Under the Main Process Building

In September, SFC began an internal review, with their senior employees and of their files, to review pertinent information related to the subfloor process monitor and contamination under the main process building. In order to determine the extent of previous knowledge which existed concerning the subfloor process monitor, an inspector reviewed representative historical operations logs for the uranium trioxide area. References to the well were found between 1983 and 1987, with the majority of the references occurring in 1987. The references indicated that the well was pumped regularly, with volumes pumped ranging from 1 quart to 4 gallons. The majority of the references in 1987 were made by a particular operator who provided a complete summary of activities which

occurred on his shift. Discussions with licensee personnel indicated that it was assumed that pumping was regularly conducted by operators following installation of the well in the mid-1970's, although the quality of the documentation depended on the individual operator.

Inspector interviews with senior SFC employees indicated that many employees were aware that the ground under the solvent extraction and main process buildings was contaminated. Problems with the integrity of the floors in the solvent extraction building and in the digestion and boildown areas in the main process building were recognized many years ago. In the middle 1980s, the licensee repaired and placed stainless steel over the floors in the digestion and boildown areas to prevent future degradation. However, the fact that past operations had allowed process liquids that were on the floor to seep into the ground underneath both buildings was well known.

An SFC engineer showed an inspector a November 12, 1986, copy of a memorandum that indicated that a high concentration of uranium in the ground was believed to be leaking into the cooling water system piping. The memorandum noted that "Samples of ground-water process areas indicate that high concentrations of uranium have been present in the past." Also, the memorandum noted that "the plant is built on a layer of sand which is quite permeable and allows migration of any soluble materials."

Therefore, it appears that SFC had substantial knowledge about the potentially elevated uranium levels in the ground under and around the solvent extraction and main process buildings. This was available through the knowledge of its employees and verified by historical files.

9. Exit Meetings

On Friday, November 16, 1990, and on Friday, January 18, 1991, an inspector conducted exit interviews after inspecting the environmental protection program at SFC. Issues related to compliance with the Order and other findings were discussed with SFC managers.

Table 1

Well No.	Area Monitored	Quality of data	Well Completion Date	Date Completed	Log Available	T.D. (feet)
270-1	270 fert. area	good	yes	5/8/79	yes	80.0
270-2	270 fert. area	good	yes	5/8/79	yes	30.0
270-3	270 fert. area	good	yes	5/8/79	yes	25.0
RHMW-1	Rabbit Hill fert. area	good	yes	4/25/82	yes	51.0
RHMW-2	Rabbit Hill fert. area	good	yes	4/23/82	yes	50.0
RHMW-3	Rabbit Hill fert. area	good	yes	4/21/82	yes	50.0
RHMW-4	Rabbit Hill fert. area	good	yes	4/28/82	yes	50.0
RHMW-5	Rabbit Hill fert. area	good	yes	4/27/82	yes	50.5
RHMW-6	Rabbit Hill fert. area	good	yes	4/13/82	yes	50.0
RHMW-7	Rabbit Hill fert. area	good	yes	4/20/82	yes	50.0
2301A	R.A. north	good	yes	11/25/86	yes	10.7
2301B	plugged	-	-	-	-	-
2302A	plugged	-	-	plugged	-	-
2302B	plugged	-	-	plugged	-	-
2303A	plugged	-	-	plugged	-	-
2305*	Pond #2	poor	no	-	no	38.8
2306*	R.A. south	poor	no	-	no	39.0
2310*	R.A. north	poor	no	10/ ?/76	no	25.8
2311	R.A. east	poor	no	11/09/82	no	24.0
2312*	R.A. east	poor	no	10/ ?/76	no	21.8
2313*	Pond #2	poor	no	04/ ?/77	no	22.0
2314*	Pond #2	poor	no	04/ ?/83	no	25.1
2315*	R.A. northwest	poor	no	-	no	37.0
2316*	Pond #2	poor	no	-	no	39
2317*	Pond #2	poor	no	04/ ?/77	no	19.8
2318*	Pond #2	poor	no	04/ ?/77	no	20.1
2319*	Pond #2	poor	no	04/ ?/77	no	23.5
2322-A	raf. ponds	good	yes	04/03/85	yes	32.0
2325*	Pond #2	poor	no	02/ ?/82	no	21.9
2326*	Pond #2	poor	no	02/ ?/82	no	15.1
2327	Pond #2	good	yes	02/02/82	yes	27.3
2328	Pond #2	good	yes	02/02/82	yes	28.0
2329	Pond #2	good	yes	02/02/82	yes	23.0
2330	Pond #2	good	yes	02/02/82	yes	22.0
2338	Pond #2	good	yes	01/25/84	yes	29.0
2339	Pond #2	good	yes	01/26/84	yes	20.0
2340A	raf. ponds	good	yes	11/13/85	yes	16.5
2341	raf. ponds	good	yes	04/04/85	yes	20.0
2342	raf. ponds	good	yes	04/02/85	yes	40.0
2343	raf. ponds	good	yes	06/14/85	yes	40.0
2344	raf. ponds	good	yes	04/02/85	yes	23.0
2345	raf. ponds	good	yes	11/12/85	yes	30.0
2346	raf. ponds	good	yes	11/13/85	yes	23.0
2347	raf. ponds	good	yes	11/18/85	yes	28.2
2348	raf. ponds	good	yes	11/13/85	yes	30.8
2349	raf. ponds	good	yes	11/14/85	yes	25.1
2350	raf. ponds	good	yes	11/19/85	yes	26.4
2351	raf. ponds	good	yes	06/17/86	yes	50.1
2352	raf. ponds	good	yes	06/17/86	yes	48.5
2352	raf. ponds	good	yes	06/12/86	yes	54.0
2354	raf. ponds	good	yes	06/12/86	yes	52.0
2355	raf. ponds	good	yes	06/11/86	yes	54.0
2356	raf. ponds	good	yes	06/10/86	yes	52.9

Table 1 (cont.)

<u>Well No.</u>	<u>Area Monitored</u>	<u>Quality of data</u>	<u>Well Completion Date</u>	<u>Date Completed</u>	<u>Log Available</u>	<u>T.D. (feet)</u>
FTP 2B	raf. ponds	good	yes	11/11/85	no	-
F-1*	R.A. south	none	no	-	no	-
F-2*	R.A. south	none	no	-	no	-
F-3*	R.A. south	none	no	-	no	-
T-1*	Pond #2	none	no	04/ ?/77	no	22.4
T-2*	Pond #2	none	no	04/ ?/77	no	23.6
T-4	Pond #2	good	yes	09/28/83	no	23.0
T-5	Pond #2	good	yes	05/09/79	yes	25.0
ED-1	Pond #2	fair	no	09/30/76	yes	51.0
ED-5	R.A. west	fair	no	10/05/76	yes	49.5
ED-8	R.A. west	fair	no	10/11/76	yes	50.0
ED-10	R.A. west	fair	no	10/18/76	yes	51.0
ED-11	Pond #2	poor	no	-	no	41.5
M-1	Pond #2	fair	no	10/22/76	yes	27.0
M-2	Pond #2	fair	no	10/20/76	yes	26.0
M-3	Pond #2	fair	no	10/20/76	yes	26.0
M-4	Pond #2	fair	no	10/19/76	yes	28.0
M-5*	Pond #2	poor	no	06/ /74	no	22.0
M-6*	Pond #2	poor	no	06/ /74	no	22.0
M-7*	Pond #2	poor	no	06/ /74	no	15.0

*Data for these wells taken from list compiled by SFC on 01/22/87.

R.A. = Restricted Area
 - = data item not available
 ? = actual date unknown

Table 2

Impoundment	Lining	Capacity	Estimated inventory (1000 ft ³)			Discharge To	Water Composition	Leaking'
			Sludge Vol.	Liquid Vol.	Sludge Composition			
NO. 1 BASIN	none	133.3	50.0	1.0	* 4 gI/u	Comb. stream	20 int	unknown
NORTH DITCH/ EMERGENCY BASIN	none	12.5	2.3	6.0	* 0.6 gI/u	Comb. stream or No. 1 Basin	20 int	unknown sludge
SANITARY LAGOON	none	128.8	14.0	114.8	12495 ug/g	Sewage treatment	5 int	suspected
RAFFINATE CLARIFIER A1	clay and hypalon	336.0	1.0	292.6	* 22 pCi/g Ra-226 *5060 pCi/g Th-230 <270 pCi/g U	Raffinate Clarifier A	150- 200	yes
RAFFINATE CLARIFIER A2	clay and hypalon	336.0	135.0	192.0	* 22 pCi/g Ra-226 *5060 pCi/g Th-230 < 270 pCi/g U	Raffinate Clarifier A4	100 int	yes
RAFFINATE CLARIFIER A3	clay and hypalon	336.0	0.8	289.4	* 22 pCi/g Ra-226 *5060 pCi/g Th-230 < 270 pCi/g U	Pond 3E or 3W	300 int	yes
RAFFINATE CLARIFIER A4	clay and hypalon	336.0	208.0	22.0	* 22 pCi/g Ra-226 *5060 pCi/g Th-230 < 270 pCi/g U	Clarifier A1	150- 200 int	yes

Table 2 (cont.)

Impoundment	Lining	Capacity	Estimated inventory (1000 ft ³)			Discharge To	Water Composition	Leaking ¹
			Sludge Vol.	Liquid Vol.	Sludge Composition			
RAFFINATE Pond #2	clay	2963.0	487.0	1410.0	* 22 pCi/g Ra-226 *5060 pCi/g Th-230 < 270 pCi/g U	Clarifier A1 Clarifier A3	100-200 100	yes
FLUORIDE SLUDGE SETTLING BASIN #1	none	46.8	29.3	10.7	* 740 pCi/g U	Fluoride Clarifier	35 + rainfall	unknown
FLUORIDE SLUDGE SETTLING BASIN #2	none	46.8	40.0	1.0	* 740 pCi/g U	Fluoride Clarifier	35 + rainfall	unknown
FLUORIDE CLARIFIER	none	102.1	20.0	82.1	* 740 pCi/g U	Comb. stream	35 - rainfall	unknown
FLUORIDE RETENTION BASIN #4	none	69.0	59.0	3.5	* 740 pCi/g U	Pump off rain water to fluoride basins 1 and 2	int	suspected
FLUORIDE SLUDGE HOLDING BASIN #1	none	186.8	171.4	9.0	* 740 pCi/g U	Pump off rain water to fluoride basins 1 and 2	int	unknown
FLUORIDE SLUDGE HOLDING BASIN #2	clay	201.0	186.0	12.0	* 740 pCi/g U	Fluoride basin #1 or #2	50 int	suspected
POND 4	clay and hypalon	2235.0	1123.0	0	* 22 pCi/g Ra-226 *5060 pCi/g Th-230 * 270 pCi/g U	Sludge de- watering	100-300 int	no

Table 2 (cont.)

Impoundment	Lining	Capacity	Estimated inventory (1000 ft ³)			Discharge To	Water Composition	Leaking ¹
			Sludge Vol.	Liquid Vol.	Sludge Composition			
POND 3E	clay and hypalon	2166.0	0	902.0	?	Land Application	int	no
POND 3W	clay and hypalon	2213.0	0	1340.0	?	Land Application	int	yes
POND 5	clay and hypalon	2178.0	0	1464.0	?	Land Application	int	no
POND 6	clay and hypalon	2142.0	0	2054.0	?	Land Application	int	yes
DECORATIVE (Fish Pond)	none	75.0	0	75.0	?	Comb. stream	50 int	unknown

* - level based upon limited data base



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

EDO Principal Correspondence Control

ACTION

FROM: DUE: 05/24/91 EDO CONTROL: 0006457
DOC DT: 03/19/91
FINAL REPLY:

Sen. David L. Boren
(Referred by 4/12/91 ltr fm EPA)

TO:

Robert Layton, EPA

FOR SIGNATURE OF: ** GRN ** CRC NO: 91-0385

Executive Director

DESC:

ROUTING:

ENCLOSES LETTER FROM THELMA MOTON CONCERNING
SEQUOYAH FUEL PLANT

Taylor
Sniezek
Thompson
Blaha
Bernero, NMSS

DATE: 04/30/91

ASSIGNED TO: RIV CONTACT: RMartin

SPECIAL INSTRUCTIONS OR REMARKS:
REPLY TO TULSA, OKLAHOMA OFFICE.
MARK ENVELOPE ATTN: MIKE CARR.
RETURN INCOMING WITH REPLY.

OFFICE OF THE SECRETARY
CORRESPONDENCE CONTROL TICKET

PAPER NUMBER: CRC-91-0385 LOGGING DATE: Apr 29 91
ACTION OFFICE: EDO
AUTHOR: DAVID BOREN--CONST REF
AFFILIATION: UNITED STATES SENATE
ADDRESSEE: ROBERT LAYTON--EPA
LETTER DATE: Mar 19 91 FILE CODE: MH&S-3-2
SUBJECT: CONTAMINATION AT THE SEQUOYAH FUELS CORP'S URANIUM
CONVERSION PLANT
ACTION: Direct Reply
DISTRIBUTION: OCA TO ACK
SPECIAL HANDLING: EPA REFERRAL
NOTES: CC: NRC CONST--T. MOTON
DATE DUE: May 13 91
SIGNATURE: . DATE SIGNED:
AFFILIATION:

Rec'd Off. EDO
Date 4-30-91
Time 9A

EDO --- 006457

6H
United States Senate

March 19, 1991

Respectfully referred to:

Mr. Robert E. Layton
Environmental Protection Agency
1445 Ross Ave.
Dallas, Tx 75202-2733

RE: Mrs. Thelma Moton

PLEASE RESPOND TO ATTENTION OF:

Mike Carr
Office of Senator David L. Boren
409 S. Boston
Suite 1820
Tulsa, Oklahoma 74103

(918) 581-7785
F.T.S. 745-7785

Because of the desire of this office to be responsive to all inquiries and communications, your consideration of the attached is requested. Your findings and views, in duplicate form, along with return of the enclosure, will be appreciated by

David L. Boren

David L. Boren, U.S.S.



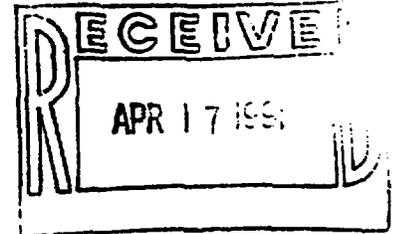
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

1445 ROSS AVENUE, SUITE 1200

DALLAS, TEXAS 75202-2733

APR 12 1991



Honorable David L. Boren
United States Senator
409 S. Boston, Suite 1820
Tulsa, Oklahoma 74103

Dear Senator Boren:

Thank you for your letter of March 19, 1991, in behalf of your constituent, Mrs. Thelma Moton. Mrs. Moton is concerned about contamination that is reported to have occurred at the Sequoyah Fuels Corporation's Uranium Conversion Plant at Gore, Oklahoma. Mrs. Moton believes that the plant should be shut down and the contamination cleaned up.

Since the Sequoyah plant is licensed by the U.S. Nuclear Regulatory Commission (NRC) and the NRC has full authority to require cleanup of releases of source material (uranium), the EPA has chosen, as a policy matter, not to list such releases on the National Priorities List. This policy was published in Final Amendments to the National Oil and Hazardous Substances Contingency Plan; National Priorities List, on September 8, 1983. A copy of these amendments (48 Federal Register 40661) is enclosed for your information.

Accordingly, I am taking the liberty of forwarding your letter to the NRC for their response.

I hope you find this information helpful in responding to Mrs. Moton's concerns. Please let me know if I can be of further assistance.

Sincerely yours,

for Robert E. Layton Jr.

Robert E. Layton Jr., P.E.
Regional Administrator

Enclosure

cc: Robert D. Martin, Regional Administrator
Nuclear Regulatory Commission Region IV

9104230293 910412
FDR ADDCK 04008027
C FDR

IE-07
41

3-8-91

Dear Senator Boren

The latest newspaper article on the sloppy way this Sequoyah Fuel plant is run in Gore.

Until you put enough pressure on this plant, NRC, EPA and the Oklahoma State Health Dept. to do the job right, this plant should be closed and the 24,000 pounds of Uranium cleaned up by the owners of the plant, not by the taxpayers.

Mr. Billiard's statement about the employees lack of sensitivity means ignorant skies. Who does he think would work in such a sloppy run place? But illiterate people. He is the one who should be forced to live in Visser Gore for years and breathe what we do, drink our water and eat our food, but he like others fly in then out quick like, and have the gall to say it's not in the Community. All who live here are not ignorant skies.

Sincerely

Mrs. Thelma Norton

Feds again cite Gore nuke plant

3-7-91

By ELIZABETH TODD

Phoenix Staff Writer

Sequoyah Fuels Corp. apparently has violated regulations by not properly evaluating all material released from the plant, a Nuclear Regulatory Commission report released Wednesday said.

The NRC will conduct further investigations to determine whether the plant in Gore has committed a violation, said NRC spokesman Joe Gilliland.

The report also found samples containing uranium have been discarded into a laboratory sink and released into a holding tank and leach field at the plant. Sequoyah Fuels, a uranium conversion plant, had not evaluated the uranium concentration in the tank or field, the report said.

The report questioned the uranium conversion plant's method of diluting material from storage ponds with wastewater found in a combination stream at the plant. The NRC noted Sequoyah Fuels had not looked at alternatives to merely diluting the material, Gilliland said. One option would be reprocessing water.

The preliminary results of the

investigation indicate significant environmental contamination at the plant, the report said. Some quantities of licensed material have migrated outside the plant's restricted area but haven't left the plant's property boundary. Sequoyah Fuels has taken steps to control that, the report said.

The report is a result of ongoing NRC investigations into Sequoyah Fuels. The probes began in August after uranium levels on plant property were found to be 35,000 times higher than that at which action must be taken, Gilliland said. NRC investigators found members of the Sequoyah Fuels staff were aware contaminated material existed beneath plant buildings and they could migrate

through the ground into groundwater, Gilliland said.

"However, no one interviewed was sensitive to the significance of this contamination nor the amounts of materials released," the report said. This lack of sensitivity is at the root of Sequoyah Fuels' recent problems, Gilliland said.

"That's the theme that runs through every report," Gilliland said.

Sequoyah Fuels Vice President Ron Adkisson said the plant is working to improve its communication with the NRC.

The NRC also pointed out the following concerns in its report:

- Several plant monitor wells are inadequate to detect environmental contamination at the plant, the amount of material released and the direction of groundwater movement.

- Disposing material containing uranium into unlined ponds could allow it to leak into the ground. The NRC said it was reasonable to assume materials are continuously being released. Sequoyah Fuels has taken reasonable steps to stop leakage from floors and

not unlined ponds.

- Sequoyah Fuels had not considered whether the groundwater monitoring program should monitor other trace metals that, over the years, may have concentrated in waste solutions.

- The NRC questions the basis for an environmental action level being set at 225 grams of uranium per liter of water. An action level calls for investigation and solving whatever problem is discovered. Naturally occurring uranium levels consistently fall well less than 10 micrograms per liter — known as a site background level. The NRC thinks it would make more sense to change the action level. Sequoyah Fuels said it also is puzzled about the action level.