

ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 70-925/95-02

License: SNM-928

Licensee: Kerr-McGee Corporation

Inspection At: Cimarron Uranium Plant, Crescent, Oklahoma

Inspection Conducted: October 17-19, 1995

Inspector: R. J. Evans, Health Physicist
Nuclear Material Inspection and
Fuel Cycle/Decommissioning Branch

Approved: _____

Linda Howell
L. L. Howell, Chief

Nuclear Materials Inspection and
Fuel Cycle/Decommissioning Branch

12/7/95
Date

Inspection Summary

Areas Inspected: This was a special, announced inspection of the "Phase I" final survey program and related activities.

Results:

- The Phase I final survey was performed by the licensee in a manner that was generally consistent with commitments made in the NRC-approved final survey plan (Section 1.1).
- Specific aspects of the final survey program reviewed during the inspection were determined to be adequate, including site implementing procedures, development and control of survey records, and final survey team staffing (Section 1.1).
- No radioactive material above NRC release guidelines was identified during random inspections of the Phase I areas. Survey maps were easy to read and properly reflected actual site conditions. Specific areas of the site property were easily relocated with the use of the licensee's maps and ground positioning system (Section 1.2).
- A quality assurance program has been implemented for the final survey at the site. However, the final survey program had not been reviewed during the licensee's routine quarterly corporate audits (Section 1.5).

Attachments:

- Attachment 1 - Persons Contacted and Exit Meeting
- Attachment 2 - Photographs Taken at Cimarron Facility

DETAILS

1 CLOSEOUT INSPECTION AND SURVEY (83890)

Portions of the final survey program were inspected to determine if the licensee had implemented the program in accordance with requirements established in the Decommissioning Plan and Final Survey Plan. In addition, representatives from the Oak Ridge Institute for Science and Education (ORISE), contractors for the NRC, performed random confirmatory surveys to independently assess the reliability and validity of the survey methods used and results obtained by the licensee.

1.1 Final Survey Program Implementation

The licensee planned to perform the final survey of the site in three stages, referred to as Phases I, II, and III. The phases were classified, in part, on whether the site areas were either "affected" (areas having potential or known radioactive materials or contamination) or "unaffected" (areas not expected to contain radioactive materials or contamination). Most of the unaffected areas of the site, encompassing about 695 acres of the 840-acre site, were included in Phase I. This Phase consisted of property which was used primarily for agricultural purposes. Because of the size of this area, it was subdivided into five subsections designated as Sub-areas A, B, C, D, and E.

The licensee's final survey plan for Phase I was submitted to the NRC on October 20, 1994. The Phase I final survey plan was subsequently approved by the NRC on May 1, 1995, following the licensee's resolution of all NRC comments on the plan. After completion of final surveys of the Phase I areas, the licensee submitted a final survey report to the NRC in July 1995 for review and approval. The licensee's goal was to release the Phase I property and to remove it from areas designated in the license.

NRC submitted comments regarding the Phase I final survey report to the licensee on September 5, 1995. At the time of this inspection, the licensee had not yet responded in writing to the NRC's comments and NRC had not yet approved the final survey report.

Following recent discussions with the NRC, the licensee indicated its intention to remove two sections of land from the Phase I final survey report, reserving them for additional review during a subsequent phase of the project. One of the sections was located in Sub-area C and the second was located in Sub-area E. These two sections of land were classified as "unaffected" areas; however, they were located in natural drainage pathways downstream of the plant. Because these locations could have received potentially contaminated runoff from the plant, the licensee decided to reassess its classification of the areas to determine if these sections should have been classified as "affected."

During the inspection, the NRC-approved Phase I final survey plan was reviewed and was compared to the licensee's final survey report. The inspector found that the licensee had implemented the final survey plan in an acceptable manner.

The inspector also found that the licensee performed more sampling than was indicated in the final survey plan, including sampling for thorium concentrations in the soil and performing surface exposure rate surveys along the boundaries between the Phase I and Phase II/III areas. These extra actions were taken, in part, to maintain consistency with previous sampling activities and for conservatism.

Section 7.1 of the final survey plan stated that all activities required under the plan would be performed in accordance with site radiation protection procedures. As part of the inspection, the procedures were briefly reviewed. Overall, the procedures provided an adequate level of detail.

A potential deficiency was identified relating to the licensee's administrative control of areas for which a final survey had been completed. Specifically, once a final survey was completed in an area, the area was not being segregated by boundaries or markings to isolate the surveyed area from the remainder of the site. The inspector noted to licensee representatives that isolation and control measures can prevent the spread of radioactive contamination into areas verified to be free of contamination. Locations without these additional controls included the access gate between the uranium building and the Phase I Sub-area A section, and the open area behind the former plutonium building in Sub-area E. The licensee acknowledged this finding and stated that it would review the issue. Actions being considered by the licensee at the conclusion of the inspection included development of a site administrative procedure and site personnel training.

The licensee's Phase I final survey records were also briefly reviewed. The licensee has maintained adequate records to support the information submitted to the NRC in the final survey report.

1.2 Site Inspection

Selected Phase I areas were toured to independently ascertain whether the areas were free of radioactive material. The site areas inspected included four of the five Phase I Sub-areas (A, C, D, and E). Sub-area B was not toured because this section was neither downwind nor downstream of the plant buildings and was least likely to contain radioactive material. The areas selected for inspection were typically the areas with the highest licensee-identified survey readings in each sub-area.

The grid positions of the locations selected for inspection were easily relocated with the help of the licensee's site maps and the ground positioning system (a satellite-assisted locator system). This ground positioning system was apparently accurate to within a meter of actual position. Selected areas were noted to exhibit ambient exposure rates up to 6-7 microRoentgen per hour

above background levels, although most locations were noted to be below these exposure rates. Regardless, all measured values were below the NRC limit of 10 microRoentgen per hour above background.

In summary, no radioactive material above the NRC's release guidelines was identified in the Phase I areas. Also, the site grid maps were easy to read and properly reflected the layout of the plant.

1.3 ORISE Site Visit

During the inspection period, three members from ORISE visited the facility to perform random confirmatory surveys of the Phase I areas. The objective of these surveys was to obtain independent radiological data for use by the NRC in evaluating the adequacy and accuracy of the licensee's final survey results. The ORISE surveys included surface scans, exposure rate measurements, and soil sampling.

Soil surfaces within the Phase I areas were scanned for gamma radiation using sodium-iodide scintillation detectors. Ten randomly selected 100 x 100 meter grid blocks were scanned (two grid blocks were selected from each of the five Phase I sub-areas). A total of thirty surface soil samples were obtained from the Phase I areas (three surface soil samples were taken from each randomly selected grid block). Within each grid block, soil samples were taken from any area that exhibited elevated direct radiation levels during the surface scans. In addition, exposure rate measurements were taken at each soil sample location within the Phase I areas.

The results of the ORISE measurements were not available at the end of the inspection period; therefore, no conclusion was drawn from this portion of the inspection.

1.4 Final Radiation Survey Program Staffing and Training

According to the final survey plan and final survey report, the final survey was performed by a team of qualified individuals from the licensee's staff. The survey team consisted of a project manager, health physics supervisor, field workers, and laboratory technicians. The entire survey team operated under the direction of the project manager while selected activities of the field and laboratory workers were performed under the direction of the health physics supervisor. The staffing of the final survey team was determined to be appropriate for the level of work involved.

Section 7.2 of the final survey plan stated that all members of the final survey team would attend an in-house training session prior to commencement of work under this plan. The final survey plan also stated that this training would include survey procedures and quality assurance requirements. The special work permit used to provide specific work instructions for performing the final survey included training attendance records. All individuals involved with the Phase I final survey were provided "unaffected area" survey

and sampling training and appeared qualified to perform the tasks to which they were assigned.

1.5 Quality Assurance Audits

Quality assurance requirements were listed in both the final survey plan and final survey report. These requirements included periodic audits, split sampling, and assurance of proper equipment operation. The quality assurance manager, located onsite, performed periodic audits and documentation reviews as necessary to ensure that all aspects of the final survey program were being implemented as required.

According to the radiation protection procedure KM-CI-RP-4, "Radiological Control and Safety Audits," Section 5, audits are to be performed at least once each quarter by a corporate auditor. Each audit is to include an examination of selected aspects of license conditions, operational activities, and applicable regulatory requirements. The inspector reviewed the most recent quarterly audits and found that although thorough in nature, the audits did not address the final survey program. During subsequent discussions with licensee representatives, the inspector noted that an independent audit of the final survey program would help to ensure that any programmatic issues identified during the audit could be corrected in a timely manner and would also provide an additional level of assurance that the final survey program was being properly implemented. The licensee acknowledged this finding and stated that an audit of the final survey program may be performed during the next quarterly audit.

As a quality assurance check of the licensee's laboratory analysis of soil samples, the licensee split samples at 26 locations. These split samples were analyzed by the licensee and by an independent, offsite laboratory. The results of the split samples were reported in the final survey report. The soil sample results obtained by the independent laboratory were comparable to the results obtained by the licensee.

Finally, quality assurance measures were taken to ensure proper survey equipment operation. These measures included ensuring that the survey meters were properly calibrated and that operability checks were being performed. Special measures taken for the soil sample analysis equipment included peak centroid checks, "Chi-squared" tests, background count trending, and determinations of detector efficiency.

1.6 Conclusions

The Phase I final survey was performed by the licensee in a manner that was generally consistent with commitments made in the NRC-approved final survey plan. The licensee performed several radiological surveys that were not required by the final survey plan which was proactive on the part of the licensee.

The site implementing procedures provided an adequate level of information and instructions. Final survey records were being maintained by the licensee.

A spot check was performed to independently assess the amount and level of radioactivity in the Phase I areas. No radioactive material above NRC release guidelines was identified during the inspection. Survey maps were easy to read and properly reflected actual site conditions. Specific positions on the site property were easily relocated with the use of the licensee's ground positioning system.

The staffing and organizational structure used for the Phase I final survey was adequate for the task being performed. Training was accomplished as required.

A quality assurance program has been implemented for the final survey program at the site. However, the final survey program had not been reviewed during previous quarterly audits performed by corporate representatives. It was noted that an audit of the final survey program could be used to identify programmatic issues that should be corrected prior to the licensee performing final radiological surveys of the "affected" areas of the site.

ATTACHMENT 1

1 PERSONS CONTACTED

1.1 Cimarron/Kerr-McGee Corporation

M. Hodo, Quality Assurance Manager
J. Larsen, Vice President (via telephone)
K. Morgan, Radiation Safety Officer
V. Richards, Decontamination Supervisor
W. Rhodes, Decontamination Supervisor

1.2 Contractor Personnel

S. Marshall, Principal, Chase Environmental Group, Inc.
H. Newman, Principal, Chase Environmental Group, Inc.
W. Rogers, Consultant

1.3 State of Oklahoma

P. DeWoody, Senior Environmental Specialist
Oklahoma Department of Environmental Quality

1.4 Oak Ridge Institute for Science and Education (ORISE)

T. Herrera, Environmental Survey and Site Assessment Program
L. Mashburn, Environmental Survey and Site Assessment Program
J. Payne, Environmental Survey and Site Assessment Program

The personnel listed above attended the exit meeting, with the exception of the ORISE personnel. In addition to the personnel listed above, the inspector contacted other personnel during this inspection period.

2 EXIT MEETING

An exit meeting was conducted on October 19, 1995, at the Cimarron facility in Crescent, Oklahoma. During this meeting, the inspectors reviewed the scope and findings of the report. The participants did not identify as proprietary any information provided to, or reviewed by, the inspector.