



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005

September 10, 2004

Mr. Russell H. Jones, Project Manager
Kerr-McGee Corporation
Kerr-McGee Center
P.O. Box 25861
Oklahoma City, Oklahoma 73125

SUBJECT: NRC INSPECTION REPORT 040-08006/04-001

Dear Mr. Jones:

On May 27, 2004, the NRC completed an inspection of your Kerr-McGee Chemical, LLC, Technical Center site located in Oklahoma County, Oklahoma. An exit briefing was conducted onsite at the conclusion of the inspection. A final telephonic exit was conducted with you and members of your staff on August 18, 2004, to discuss the results of confirmatory measurements performed by the NRC inspectors. The enclosed report presents the scope and results of that inspection.

The primary purpose of this inspection was to conduct a confirmatory sample in-process review of your decommissioning efforts at the Technical Center. The inspection included the collection and analysis of surface wipes from indoor survey unit areas where decommissioning had been completed. No violations of NRC regulations were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure and your response (if any) 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).

Should you have any questions concerning this inspection, please contact the undersigned at (817) 860-8191 or R. Rick Muñoz at (817) 860-8220.

Sincerely,

/RA/

D. Blair Spitzberg, Ph.D., Chief
Fuel Cycle & Decommissioning Branch

Docket No.: 040-08006
License No.: SUB-986

Enclosure: As stated

Kerr-McGee Corporation

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cc w/enclosure:

Mike Broderick, Director

Oklahoma Department of Environmental Quality

Radiation Management Section

707 North Robinson Avenue

Oklahoma City, Oklahoma 73102-6087

bcc w/enclosure (via ADAMS distrib.):

- MASatorious
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- DBSpitzberg
- RRMuñoz
- RSBrowder
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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.: 040-08006

License No.: SUB-986

Report No.: 040-08006/04-001

Licensee: Kerr-McGee Company

Facility: Kerr-McGee Chemical, LLC, Technical Center

Location: Intersection of NW 150th Street and State Highway 74
Oklahoma County, OK

Dates: May 24-27, 2004

Inspectors: Rachel S. Browder, Project Manager
R. Rick Muñoz, Health Physicist

Approved by: D. Blair Spitzberg, Ph.D., Chief
Fuel Cycle & Decommissioning Branch

Attachment: Supplemental Information

ADAMS Entry: IR 04008006-04-01; on May 27, 2004; Kerr-McGee Corporation;
Technical Center. Decommissioning Report. No violations were
identified.

EXECUTIVE SUMMARY

Kerr-McGee Chemical, LLC, Technical Center
NRC Inspection Report 040-08006/04-001

Kerr-McGee Chemical, LLC, had been conducting site remediation activities at its Technical Center facility in preparation for the termination of Radioactive Source Materials License SUB-986. Kerr-McGee Technical Center requested termination of their NRC license on January 7, 1999. This announced inspection focused on confirmatory radiological surveys from 10 indoor survey units which Kerr-McGee had remediated as part of their decommissioning activities.

Decommissioning for Material Licensees

- Site decommissioning activities were found to have been conducted in accordance with the approved decommissioning plan submitted to the NRC. Areas being decommissioned by the licensee will continue to be controlled pending release by the NRC through license termination (Section 1).

Closeout Inspection and Survey

- The decommissioning activities completed in Survey Units SU-100 through SU-110 were in compliance with the site decommissioning plan (Section 2).
- All 226 independent confirmatory exposure-rate measurements made by the inspectors within 10 survey unit areas, were below the applicable NRC release criteria. The results of confirmatory measurements made within these 10 survey units were consistent with the licensee's determination that these areas met the criteria established in the licensee's site decommissioning plan for unrestricted use (Section 2).
- Eighty-one smear samples were collected from the survey units and were sent for analysis to ORISE, the NRC contract radioanalytical laboratory. The samples were analyzed for alpha and beta removable contamination using a low background alpha/beta counter. All smear sample results were below the criteria for unrestricted use as approved in the decommissioning plan (Section 2).

Follow-Up

- One Inspection Follow-up Item identified during a previous inspection was closed (Section 3).

Report Details

1. Decommissioning for Material Licensees (87104)

1.1 Scope

The site status and decommissioning activities were reviewed to determine if activities were being conducted in accordance with the regulatory requirements and the NRC approved Kerr-McGee Technical Center Site Decommissioning Plan (DP).

1.2 Observations and Findings

The licensee submitted a decommissioning plan on July 11, 2000. A revised decommissioning plan was submitted for approval on April 5, 2001. The licensee used ICRP-72 dose factors in lieu of the default ICRP-30 dose factors, in which most decommissioning and other licensing actions are based. The derived concentration guideline levels (DCGLs) for the adult critical group as submitted by the licensee was approved as part of the decommissioning plan approval on June 5, 2003, by License Amendment 09. The licensee submitted the Final Status Survey Report (FSSR) for the Outdoor Survey Units (SU) on September 15, 2003. It contained buried and embedded piping based on building surface release criteria. The region discussed with the licensee that they could not arbitrarily use building surface DCGLs for buried and embedded piping. The NRC reviewed the FSSR for the outdoor SUs, and approved the submittal on February 9, 2004, but requested by letter dated February 9, 2004, that the licensee submit specific modeling for the piping. The licensee submitted the modeling for the piping in the form of two Technical Memorandums (04-02 and 04-03) in Appendices 6 and 7 of their indoor FSSR. The piping survey units were identified as EP-1 and EP-2. Region IV submitted a technical assistance request to NRC headquarters which is currently being reviewed for the dose modeling for embedded and buried piping.

The licensee submitted the FSSR for the Indoor Survey Units on April 27, 2004. The Kerr-McGee Technical Center was a research facility with approximately 50 research laboratories onsite. Approximately 25 of these laboratories presented a potential for a source of radioactive contamination. The facility, including the 25 laboratories no longer handled any radioactive material. The facility employed approximately 85 people who worked primarily on titanium dioxide and electric battery research, and did not involve any licensed radioactive material. The site occupied approximately 160 acres. Although there were nearby agricultural operations, apartments, condominiums, and golf courses, the parcel of land was expected to remain commercial property.

All decommissioning activities had been completed in Survey Units SU-100 through SU-110 in accordance with the site decommissioning plan. The SUs included laboratories in the main building, the storage building, and the TSSL building. This inspection focused on confirmatory radiological surveys of laboratories and areas within the 10 indoor SUs which Kerr-McGee had remediated as part of their decommissioning activities.

1.3 Conclusions

Site decommissioning activities were found to have been conducted in accordance with the approved decommissioning plan submitted to the NRC. Areas being decommissioned by the licensee will continue to be controlled pending release by the NRC through license termination.

2 **Closeout Inspection and Radiological Surveys (83890)**

2.1 Scope

The licensee's preparations and conduct of the final survey and analysis were reviewed to verify compliance with the methodologies in NUREG 1575, the licensee's site decommissioning plan, and the requirements of 10 CFR 40.42(d). Measurements were conducted by the NRC inspectors in two Class I and eight Class II SUs where the licensee had completed decommissioning activities. Independent NRC confirmatory surveys for fixed surface alpha/beta and gamma radiation of locations within the SU areas were performed by the NRC inspectors. The inspectors performed radiological surveys in and around Survey Unit 001 through Survey Unit 010 to establish biased surface wipe sample locations to obtain a representative number wipe samples within these survey units. The SUs included 20 laboratories in the main building, a stand alone storage building, pilot plant area, sample preparation room and the TSSL building. NRC wipe samples obtained were analyzed by the Environmental Survey and Site Assessment Program (ESSAP) of the Oak Ridge Institute for Science and Education (ORISE).

a. Instrument Used

For independent confirmatory surveys, the NRC inspectors used an Eberline Model E-600 instrument, coupled with an alpha/beta dual phosphor scintillation probe used to measure fixed alpha and beta radiation. A radiological survey Micro-Roentgen rate meter was used for area gamma surveys:

<u>Model</u>	<u>Serial #</u>	<u>NRC #</u>	<u>Calibration Due</u>
Ludlum Model 19	33541	015525	03/23/05
Eberline E-600	00763	063473	06/16/05
Eberline SHP 380AB	00906	00907	06/16/05

b. Background Measurements

To determine applicable background values, average background references were established by the NRC inspectors from 10 survey locations in the front lobby of the Kerr-McGee facility. Gamma background levels were established at 6-microRoentgen per hour. Alpha was established at 19 disintegrations per minute (dpm) per 100 cm² and beta was 2171 dpm/100 cm².

c. Radiological Surveys

The approved DCGLs based on ICRP-72 dose factors and adult critical group were:

Radionuclide	DCGL Value α/β
Uranium Series - Indoor Surfaces	177,300 dpm/100 cm ²
Th-232 Series - Indoor Surfaces	12,500 dpm/100 cm ²
Th-230 Series - Indoor Surfaces	16,300 dpm/100 cm ²

The inspectors surveyed 226 independent confirmatory exposure-rate and surface contamination measurements within the 10 survey unit areas. Gamma readings ranged from background to the highest gamma survey point of 6 microR/hr above background. Gross alpha/beta fixed surface contamination surveys were obtained using 1-minute integrated counts. The highest alpha reading was a net 17 dpm/100 cm² and 6542 dpm/100 cm² for beta. The inspectors noted that direct measurements for fixed alpha and beta contamination within the survey units were all below the approved release criteria.

The inspectors collected surface wipes at 81 locations for analysis by the NRC's contract laboratory, Oak Ridge Institute for Science and Education (ORISE). The samples were analyzed for alpha and beta contamination using a low background alpha/beta counter. The requested minimum detectable concentration (MDC) for alpha and beta activity was 20 dpm per wipe using a 2-minute sample count time. The alpha and beta activity values for all the wipes were below the requested MDC except the beta values for sample E-30/57 in Survey Unit 102 and for sample C-33/78 in Survey Unit 101. The alpha MDC for a 2-minute count was 8.9 dpm and the beta MDC was 15 dpm. The two wipes were counted for 10 minutes to improve the counting statistics and confirm the activity values generated by the 2-minute count. The beta activity for sample E-30/57 was 7.3 ± 4.0 dpm and the beta activity for sample C-33/78 was 19.2 ± 5.1 dpm. The beta MDC for the 10-minute count was 5.6 dpm. All wipe sample results, fixed alpha/beta and gamma survey values were below the release criteria.

2.3 Conclusions

The decommissioning activities completed in Survey Units SU-100 through SU-110 were in compliance with the site decommissioning plan. All 226 independent confirmatory exposure-rate measurements made by the inspectors within 10 survey unit areas, were below the applicable NRC release criteria. The results of confirmatory measurements made within these 10 survey units were consistent with the licensee's determination that these areas met the criteria established in the licensee's site decommissioning plan for unrestricted use. Eighty-one smear samples were collected from the survey units and were sent for analysis to ORISE, the NRC contract radioanalytical laboratory. The samples were analyzed for alpha and beta removable contamination using a low background alpha/beta counter. All smear sample results were below the criteria for unrestricted use as approved in the decommissioning plan.

3 Follow-up (92701)

(Closed) 40-8006/0101-01 An unexplained source of contaminated water was seeping into the cavity generated during the removal of the uranium test pits. Total uranium concentrations in water samples collected and analyzed by the licensee at the west seep around the uranium test pits had been as high as 1270 pCi/l, but had trended down to 100 to 300 pCi/l by March 30, 2001. The licensee established eight monitoring wells around the test pits. Sample results from these monitoring wells indicated that the test pits had not impacted the near surface groundwater.

Elevated west seep results, their cause, and whether they impact the adequacy of remediation was a concern. No conclusion was reached as to the source of the elevated samples. However, the licensee had established eight monitoring wells around the test pits when they were in place and operable. Historically, the sample results from these monitoring wells indicated that the test pits had not impacted the near surface groundwater. Additionally, seep sample activity level results from subsequent samples collected, showed a downward trend and were below the release criteria. It was deemed appropriate to backfill the test pit excavation.

4 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection period on May 27, 2004. On August 18, 2004, after the results of laboratory analysis of the surface wipe samples collected by the inspectors were received and analyzed, a final telephonic exit briefing was conducted with the licensee. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspectors. There were no violations noted.

ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. Jones, Program Manager
K. Morgan, Corporate Radiation Safety Officer
J. Johnson, Radiation Safety Officer

NEXTEP Environmental (Licensee Contractor)

R. Callahan, Contractor
H. J. Newman, Health Physicist

INSPECTION PROCEDURES USED

IP 88104	Decommissioning Inspection Procedure for Fuel Cycle Facilities
IP 83890	Closeout Inspection and Survey
IP 92701	Follow-up

ITEMS OPENED, CLOSED AND DISCUSSED

Closed

IFI 40-8006/0101-01	An unexplained source of contaminated water was seeping into the cavity generated during the removal of the uranium test pits. Total uranium concentrations in water samples collected and analyzed by the licensee at the west seep around the uranium test pits had been as high as 1270 pCi/l, but had trended down to 100 to 300 pCi/l by March 30, 2001. The licensee established eight monitoring wells around the test pits. Sample results from these monitoring wells indicated that the test pits had not impacted the near surface groundwater.
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LIST OF ACRONYMS

DP	Decommissioning Plan
DCGLs	Derived Concentration Guideline Levels
ESSAP	Environmental Site Survey and Assessment Program
FMPC	Fraction of the Maximum Permissible Concentrations
IFI	Inspection Follow-up Item
MDC	Minimum Detectable Concentration
NRC	Nuclear Regulatory Commission
ORISE	Oak Ridge Institute for Science and Education
pCi/g	Pico-Curies per gram
pCi/l	Pico-Curies per liter
SU	Survey Units