

STATE OF ILLINOIS
DEPARTMENT OF NUCLEAR SAFETY
1035 OUTER PARK DRIVE
SPRINGFIELD, ILLINOIS 62704

Jim Edgar
Governor

217-785-9900
217-782-6133 (TDD)

Thomas W. Ortiger
Director

September 27, 1996

40-2061

Richard Bangart, Director
Office of State Programs
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Dick:

Enclosed for your information is a copy of Amendment No. 38 to Kerr-McGee's License No. STA-583. The amendment extends the expiration date to Oct. 31, 1996 and modifies Condition 52 regarding the amount of off-site contaminated material which can be received and transferred for disposal in 1996.

Sincerely,

Wayne

G. Wayne Kerr, Assistant Manager
Office of Radiation Safety

GWK:gas

Enclosure:
Amendment No. 38

cc: Jim Lynch, NRC Region III
w/enclosure

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STATE OF ILLINOIS
DEPARTMENT OF NUCLEAR SAFETY**RADIOACTIVE MATERIAL LICENSE**DIVISION OF RADIOACTIVE MATERIALS
1035 OUTER PARK DRIVE
SPRINGFIELD, ILLINOIS 62704

Pursuant to the Illinois Radiation Protection Act, and the rules and regulations in 32 Illinois Administrative Code promulgated thereunder, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess and transfer radioactive material(s) listed herein; and to use such radioactive material(s) for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations and orders of the Illinois Department of Nuclear Safety now or hereafter in effect and to any conditions specified in the license. This document confirms that the licensee has registered the sources of radiation listed below in accordance with Section 2 of the Radiation Installations Act.

LICENSEEKerr-McGee Chemical Corporation
Kerr-McGee Center
Oklahoma City, OKLICENSE NUMBER

STA-583

EXPIRATION DATEOctober 31, 1996 for
Amendment Number 38 onlyAMENDMENT NUMBER

38

Attention: Mr. Richard Thompson
Senior Project Manager

In accordance with letter dated August 19, 1996 (LKI-269), License Number STA-583 is amended in its entirety. Amendment 37 is void.

ITEM	RADIONUCLIDE	CHEMICAL and/or PHYSICAL FORM	MAXIMUM ACTIVITY* PER SOURCE	MAXIMUM POSSESSION LIMIT
A.	Thorium and Uranium	As contamination from previous operations	Only the quantity present at the site identified in Condition 1. of this license.	
B.	Radium-226	Epoxy/sand composite blocks	20 μ Ci	300 μ Ci
C.	Atomic Numbers 3 through 92	Any form	10 μ Ci	100 μ Ci
D.	Americium-241	Any form	1 μ Ci	10 μ Ci

AUTHORIZED USE:

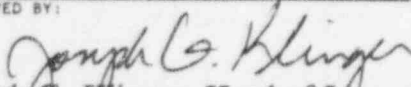
- A. Storage of Byproduct Material as defined in 32 Ill. Adm. Code 332 and use of Byproduct Material as described in Chapter 5 of the Department's Safety Evaluation Report for Phase I dated May 1994; in Chapter 5 of the Department's Addendum to the Safety Evaluation Report for Phase IA dated July 1994; in Chapter 5 of the Department's Safety Evaluation Report for Phase IB dated August 1994; in Chapter 5 of the Department's Safety Evaluation Report for Phase II dated April 1995; and in Chapter 5 of the Department's Safety Evaluation Report for Phase IIA dated September, 1995.
- B. Calibration standards for laboratory and portable gamma spectroscopy systems.
- C. Calibration standards for laboratory and portable gamma spectroscopy systems.
- D. Calibration standards for laboratory and spectroscopy systems.

* μ Ci-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μ g-microgram; kg-kilogram

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Joseph G. Klinger, Head of Licensing Section

September 24, 1996

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<u>LICENSEE</u>	<u>LICENSE NUMBER</u>	<u>AMENDMENT NUMBER</u>	<u>EXPIRATION DATE</u>
Kerr-McGee Chemical Corporation	STA-583	38	October 31, 1996 for Amendment Number 38 only

CONDITIONS

1. Radioactive material shall be stored only at the licensee's property located at 800 W. Rauch Street, West Chicago, Illinois.
2. Radioactive material shall be used only by or under the supervision of individuals designated by the Radiation Safety Officer (RSO).
3. The individual designated to perform the functions of RSO for activities covered by this license is Mark S. Krippel. Any change in the designation of the RSO shall require approval by the IDNS by license amendment. The RSO shall have, as a minimum, a bachelor's degree in engineering or science and one year of professional experience in radiation safety and applied health physics. The RSO shall have, in addition to or concurrent with the academic degree, at least four weeks of specialized training in health physics applicable to thorium and radium contaminated waste management.
4. The licensee shall also control entry to contaminated areas until the areas are released for unrestricted use. Items and surface contamination shall be decontaminated in accordance with 32 Ill. Adm. Code 340. Appendix A. Failure to meet the stipulations of this Condition may result in termination of this authorization.
5. The Air Monitoring Program sample collection and analysis shall be performed as follows.
 - A. Particulate sampling shall be performed as follows: 13 samples shall be collected as depicted in the Environmental Air Monitoring Plan for Kerr-McGee West Chicago Rare Earths Facility, August 1993, Figure 3, Appendix I, and west of the proposed Railcar Loadout Facility at a location approved by the Department. The method of collection shall be continuous. The frequency of collection shall be filter changes on each work day. The frequency of sample analysis shall be on each work day by location and shall be analyzed for natural thorium and lead-212. Quarterly composites of the samples from each location shall also be analyzed for natural uranium, an isotopic analysis of Th-228 and Th-232, radium-226, radium-228 and Lead-210 concentrations. These shall be reported in units of microcurie per milliliter ($\mu\text{Ci/ml}$).

* μCi -microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μg -microgram; kg-kilogram

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(Condition 5. continued)

- B. Radon sampling shall be performed as follows: 9 samples shall be collected as depicted in the Environmental Air Monitoring Plan for Kerr-McGee West Chicago Rare Earths Facility, Figure 3, Appendix I. The method of collection shall be continuous. The frequency of collection shall be quarterly. Sample analysis shall be quarterly by location. The samples shall be analyzed for radon-222.
6. The Water Monitoring Program sample collection and analysis shall be performed as follows.
- A. Ground water samples shall be collected at all monitor wells completed in the glacial aquifer or the Silurian dolomite aquifer at the site. The ground water samples shall be collected consistent with the West Chicago Ground Water Monitoring Procedure found in Appendix H of the Summary of Ground Water Compliance Program, Former Rare Earths Facility, West Chicago, Illinois, October 3, 1995 (LKI-191). The frequency of collection shall be quarterly. The frequency of sample analysis shall be quarterly. The samples shall be analyzed for dissolved total uranium, thorium-228, thorium-230, thorium-232, gross alpha, lead-210, and combined radium. If gross alpha exceeds 10 picocuries per liter (10 pCi/L), the analysis shall include radium-226 and radium-228. This license condition does not relieve or replace any other ground water sampling required by other license conditions.
- B. Storm sewer and surface water sampling shall be performed as follows: 7 samples shall be collected as described in the Environmental Analysis Report - Phase II issued February 1995. The method of collection shall be grab samples. The frequency of collection shall be quarterly. The frequency of sample analysis shall be quarterly. The samples shall be analyzed for lead-210 and gross alpha. If gross alpha exceeds 10 picocuries per liter (10 pCi/L), the analysis shall include dissolved and suspended natural uranium, isotopic analysis for Th-228 and Th-232, radium-226, and radium-228.
- C. Liquid effluent sampling shall be performed as follows: 1 sample from each tank shall be collected. The method of collection shall be grab samples. The frequency of collection shall be prior to release of the contents of each tank. The frequency of sample analysis shall be prior to release of the contents of each tank. The samples shall be analyzed for gross alpha, gross beta, total uranium, isotopic analysis for Th-228 and Th-232, soluble and insoluble radium-226 and radium-228.

* μ Ci-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μ g-microgram; kg-kilogram

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7. The Soil and Sediment Monitoring Program sample collection and analysis shall be performed as follows.
- A. Depositional (Soil) sampling shall be performed as follows: 7 samples, one sample from each location, shall be obtained from EMS-8, EMS-14, EMS-17, north of proposed EMS-9 on the north side of Ann Street, east of EMS-15 at the corner of Lester and the gravel road, south of EMS-5 (if there is any soil available) as depicted in Appendix I attachment to letter dated September 3, 1993, and west of the proposed Railcar Loading Facility at a location approved by the Department. The method of collection shall be grab samples. The frequency of collection shall be annual. The frequency of sample analysis shall be annual. The samples shall be analyzed for natural uranium, isotopic analysis for Th-228 and Th-232, radium-226, radium-228 and lead-210.
 - B. Sediment sampling shall be performed as follows: 1 sample shall be obtained in accordance with the December 22, 1993, First Round Interrogatory Responses, Attachment C; surface water location number 9. The method of collection shall be grab sample. The frequency of collection shall be annual. The frequency of sample analysis shall be annual. The samples shall be analyzed for natural uranium, isotopic analysis for Th-228 and Th-232, radium-226, radium-228 and lead-210.
 - C. Radiological data, statistical calculations, and proposed analytical ranges derived from baseline sampling shall be submitted to the Department for evaluation. The respective baseline ranges must be approved by the Department prior to the collection of the first sample in accordance with Conditions 7A and 7B. Any sample exceeding the maximum derived, Department-approved baseline value for a designated location shall be considered contaminated.
8. The Direct Gamma Monitoring Program sample collection and analysis shall be performed as follows.
- A. Direct radiation monitoring shall be performed as follows: 9 locations shall be monitored: EMS-4, EMS-5, EMS-7, EMS-8, EMS-9, EMS-11, EMS-15, EMS-17 and radon location R-1. A continuous passive integrating device shall be installed at each location. The frequency of collection shall be quarterly change of passive dosimeters. The frequency of sample analysis of the passive dosimeters shall be quarterly. The samples shall be analyzed to determine the gamma exposure rate.

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9. For the purpose of radionuclide determinations in soil samples from the Kerr-McGee West Chicago Facility, only laboratories with the capability to analyze Byproduct Material as defined in 32 Ill. Adm. Code 332 in the samples for environmental monitoring shall be employed. Any laboratory employed for this purpose shall use instrumentation and methodologies with lower limits of detection at or below 10% of the regulatory limits for the radiological parameters for which environmental air particulate samples are analyzed. Results indicating that a parameter is not detected shall be reported as "less than" the value of the corresponding lower limit of detection.
10. The installation, initiation and implementation of the Environmental Monitoring Program shall comply with the Kerr-McGee Quality Assurance Manual for Kerr-McGee Chemical Corporation West Chicago Project for the activities authorized by Condition 14, except that no revision that may be substantive shall be made to the Quality Assurance Manual without prior evaluation and approval by the Department.
11. The licensee shall perform a background count and check the counting efficiency for the G5000 proportional counter, Genie gamma spectroscopy system, and other laboratory based counting systems. The background count and counting efficiency shall be performed daily or, if not used daily, prior to each use. The licensee shall calibrate the systems initially, at intervals not to exceed 12 months, and after each repair of the instrument. Counting efficiencies shall be determined using appropriate standards which are traceable to the National Institute of Standards and Technology (NIST). Records shall be maintained to document the system calibration, background determinations, and counting efficiency determinations. Each record shall indicate the date of the procedure, person performing the procedure, identity of the standards used, and results of the procedures, including calculations and graphs if used.
12. Each radium calibration standard shall bear a label which includes, or contains the information called for in the following statement:

The receipt, possession, use and transfer of this source are subject to specific license and regulations of a Licensing State. Do not remove this label.

CAUTION - RADIOACTIVE MATERIAL
THIS SOURCE CONTAINS RADIUM-226
_____microcuries _____ date

* μ Ci-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μ g-microgram; kg-kilogram

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13. The licensee may not commence any activities involving Byproduct Material other than that specified as an "Authorized Use" in this license without specific written approval from the Illinois Department of Nuclear Safety.
14. The licensee is not authorized to use the Field Verification Support Unit (FVSU). Until the licensee has demonstrated satisfactory performance of the FVSU to IDNS, the licensee shall verify that the cleanup criteria have been met by using laboratories that have the capability to analyze for byproduct material in soil samples at concentrations equal to or less than the cleanup criteria.
15. The following field procedures shall be used to determine the correlation of the FVS necessary to validate the measurements of the FVS. This correlation shall be performed prior to final certification of cleanup of areas using the FVS. These correlation procedures and the associated results shall be an integral part of the QA/QC program and shall be made available to IDNS for inspection and approval prior to acceptance. Furthermore, IDNS shall have access to work areas being surveyed for unrestricted release to obtain validation samples at its discretion and shall have authority to request the licensee to re-establish the correlation of the FVS any time IDNS believes the operation of the FVS appears to be questionable.

The correlation/verification procedure shall be performed within a 30 ft. by 30 ft. area with a relatively uniform distribution of surface gamma levels and contamination. If desired, the licensee can modify the dimensions to relate to a 1000 ft² grid. The grid map in Figure 10-1 of the Department's Safety Evaluation Report, Phase I, for the Decommissioning of the Kerr-McGee, West Chicago Rare Earths Facility dated May 1994 illustrates the layout of the subject validation grid. Detailed procedures on the correlation of the unit must be submitted and approved by IDNS prior to accepted use of the FVS. The correlation/verification procedures shall include the following:

- Radiation survey: External gamma radiation surveys shall be performed using a 1-inch NaI detector (or compatible detector) on 10-foot intervals, at a height of 1 meter as illustrated in Figure 10-1. The measured exposure rate (counts per unit time or microrentgen per hour) shall be recorded for all grid intersections and at the mid-point of the 10-foot lines for the central area of the grid, as illustrated in Figure 10-1. The gamma surveys shall be extended to 10-feet beyond the grid in all survey lines and these values shall be recorded as denoted in the figure. If the gamma measurements for the grid vary by more than 5 sigma, consideration shall be given to finding an area with more uniform residual radioactivity in the soil.

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(Condition 15. continued)

- FVS Measurements: Three FVS measurements shall be made at the center of the grid.
- Soil Samples: Soil samples shall be collected from the central section of the grid and from the four areas around the center, as denoted in Figure 10-1. Each sample shall include 5 aliquots, located similar to the spots on a number five die. Samples shall be analyzed for Ra-226 and Ra-228 and K-40.
- Samples from the surface to 6 inches: A sample (composed of 5 aliquots) from the central area and from each of the four areas around the central area; total of 5 samples.
- Samples from 6-inch to 12-inch depth: A sample (composed of 5 aliquots) from the central area.

The specified correlation/verification procedures for the FVS shall be performed for at least three grids prior to using the FVS system for final clearance of land for unrestricted release. One of the grids shall contain residual radioactivity at concentrations similar to the criteria for unrestricted release. If the correlation parameters (e.g., x pCi/g of total radium based on specified instrument response) from measurements of three grids vary by more than 20 percent from the mean, the correlation/verification procedure shall be performed for at least two more grids. Before acceptance of the correlation parameter, the uncertainty of the mean shall be less than plus and minus 20 percent at the one-sigma (68 percent) sigma. The same correlation procedure shall be used for each FVS (i.e., can use the same set of soil samples).

The specified correlation/verification procedures for each FVS shall be repeated for at least one grid (e.g., can validate several FVSs using the same grid) every three months, during the periods when the FVS is being used to certify land for unrestricted release. If the correlation parameter from the verification test is outside of the range of values for previous tests, a second test shall be performed. If the average of two tests is outside of the range of previous tests by more than 10 percent (without known changes in the operations of the system), the reasons for changes shall be fully explained to and approved by IDNS or the full correlation procedure repeated.

The correlation developed for the FVS shall be reverified and the FVS shall be recalibrated after any repairs that could potentially impact the calibration of the unit. A complete correlation, using three grids, shall be performed at intervals not to exceed 12 months.

* μ Ci-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μ g-microgram; kg-kilogram

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(Condition 15. continued)

After successful completion of a full calibration, ten or more spectrum readings shall be taken using a check source. This check source shall have ratios of the isotopes similar to those of material at the West Chicago Facility, and should have a concentration between 25 pCi/g and 100 pCi/g of Ra-228. A 2-sigma experimental error term shall be derived from the ten measurements of the check source. The average of the ten readings of the check source and the associated 2-sigma error shall be used in evaluating daily check source measurements. The FVS shall be checked each day before use for verification purposes, as follows:

- A. Measure the gamma spectrum from the above check source, which contains, U-238, Ra-226, Ra-228, and K-40.
 - B. The results of the daily check source, reported as pCi/g of Ra-226, Ra-228, and K-40 shall be plotted on a control-chart graph, prior to taking measurements to validate areas for unrestricted release.
 - C. The daily source check results for the specified isotopes shall deviate less than 2-sigma (calculated from the initial 10 source check readings) from the average of the 10 readings of the check source.
 - D. If the concentration measurements of the check source deviate from the specifications of Item C., the calibration controls of the FVS shall either be adjusted to provide a response to meet the specifications of Item C. or a second check-source measurement can be taken and averaged with the first measurement for use in Item C.
 - E. Verification measurements for unrestricted release of areas shall not be made unless the FVS meets the specifications of Item C. or the instrument has been calibrated the same day.
16. The licensee shall use appropriately calibrated survey instruments for performing exposure rate surveys in accordance with 32 Illinois 332.150b2). The gamma radiation shall be measured at a distance of 100 cm from the surface. For purposes of the survey, the background gamma radiation level is defined as $10 \mu\text{R/hr} \pm 4 \mu\text{R/hr}$.

* μCi -microcurie; mCi -millicurie; Ci -Curie; MBq -Megabecquerel; GBq -Gigabecquerel; TBq -Terabecquerel; g-gram; μg -microgram; kg-kilogram

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17. The RSO shall order all outdoor contaminated waste handling operations (e.g., excavation or loading of trucks) to cease in the event of adverse weather (e.g., sustained winds exceeding 20 miles/hour averaged over a 10 minute period or rainfall exceeding 0.25 inch/hour). In addition, any time visible dust is observed at the Facility, the RSO shall take actions within 20 minutes to stop the generation of visible dust.

If the rolling average concentration at an air sampling station exceeds 50 percent of the annual airborne radionuclide limits in 32 IAC 340.320 (10 CFR 20 Appendix B, Table 2, Column 1), the RSO shall convene a management review team including himself, the Quality Assurance Supervisor, the Construction Specialist and the Project Manager. The review team shall decide how to modify site operations to maintain airborne releases ALARA and in compliance with the 32 IAC 340.320 limits. The review team shall provide a written report of their recommendations to IDNS within 14 days.

Kerr-McGee shall obtain written approval from IDNS prior to any revisions to Specification 01420, dated 3/8/94.

18. The licensee shall ensure, for the purposes of dust control, that each truck hauling contaminated soil has either: a soil moisture content that is sufficient to prevent visible dust generation; the soil on the top of the load is wet before transporting it; or the truck bed is covered. In addition, all outdoor, stockpiled, contaminated material at the West Chicago Facility shall be covered with geomembranes.
19. The licensee shall submit to IDNS a copy of the annual demonstration of compliance with the Clean Air Act New Source Performance Standards at the same time it is submitted to the Regional Office of the U.S. Environmental Protection Agency.
20. The licensee shall perform occupational air monitoring in the following locations: when digging in contaminated soil that is of low moisture content (potentially dust-generating); when excavating and decontaminating concrete; at the Stabilization/Neutralization area; at the dry screening facility located at the Incinerator Building; and/or Railcar Loading Facility.
21. The licensee shall perform bioassays (lung counting) of all personnel using respiratory protection equipment for the purpose of protection against airborne radioactive material, specifically Th-232, on at least a quarterly basis. Due to the inherent difficulty in bioassay analysis for Th-232, the licensee may substitute monthly urine sampling for U-238 as a screening technique with the above bioassay required only for persons with actual uptakes of U-238.

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22. The licensee's management, in association with the Radiation Safety Officer, shall review/audit the following areas of the radiation safety program at intervals not to exceed 12 months:
- A. Health physics authority and responsibility, including stop work authority;
 - B. Operating procedures involving the excavation, handling, stabilization, separation, loading, shipment, and/or transfer of radioactive material, and any changes in procedures;
 - C. Records of audits, inspections, and surveys conducted by the Health Physics Supervisor (for timeliness and the resolution of any problems);
 - D. Personnel radiation protection program, including employee exposure record, bioassay procedures and results, and the ALARA program;
 - E. Radiation safety training program and records;
 - F. Respiratory protection program;
 - G. Records and results of all required radiological surveys, sampling, tests for removable contamination, inspections, and environmental monitoring;
 - H. Facility and equipment design;
 - I. Control of airborne radioactive material, specifically Th-232 and U-238, and their progeny;
 - J. Compliance with applicable regulations and the conditions of this license; and
 - K. Safety meeting minutes.
23. A retention pond shall be constructed in the southwest corner of the Disposal Site and shall have a liner composed of high density polyethylene (HDPE) or at least two feet of compacted clay. The licensee is authorized to construct the emergency spillway portion of the retention pond. Emergency release of any water from the retention pond to offsite areas is subject to any necessary permits from other State and local authorities.

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24. Interfaces between clean backfill and contaminated material (which is to be excavated at a later date) shall be identified and synthetic or natural barriers shall be placed at these interfaces to prevent contamination of clean backfill material.
25. The RSO shall review and approve all dose commitment calculations and dose evaluation reports.
26. The licensee shall use TLDs and/or film badges that are provided by a vendor approved by the National Voluntary Laboratory Accreditation Program (NVLAP). The TLDs and film badges shall be exchanged on a quarterly and monthly basis, respectively.
27. The licensee shall maintain the following records in a legible condition, at the Facility for inspection by IDNS:
 - A. Radiation surveys and facility safety inspection;
 - B. Sampling programs and analysis results;
 - C. Transfers of radioactive material;
 - D. Inspections;
 - E. Annual program reviews;
 - F. All records pertaining to radiation safety training and respiratory protection training for both employees and contractors, including signed acknowledgements of training and classroom instruction materials.
 - G. Any other records required by this license or Chapter 32 of the Illinois Administrative Code.
28. Radiation dose rate and exposure rate instruments shall be calibrated at intervals not to exceed 12 months and after repairs by persons licensed by IDNS, another Agreement State, or the U.S. Nuclear Regulatory Commission.
29. Records of each calibration of radiation dose rate and exposure rate instruments shall be maintained at the site for inspection by IDNS.

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30. The licensee shall conduct an instrumentation quality assurance program which shall consist, as a minimum, of the following:
- A. Use of calibration log books which accurately indicate the calibration status of each radiological survey or measurement instrument, each low-volume and high-volume air sampler, and each other monitoring or measurement instrument, specifying the date of calibration and person performing the calibration;
 - B. Use of sources/standards which are traceable to the NIST;
 - C. Affixing a dated label on each instrument which indicates the last date of calibration;
 - D. Performance of operability checks on instruments daily or before each use on instruments used less frequently than daily; and
 - E. Availability of backup instruments for use when other instruments are being calibrated or repaired or become inoperable or unavailable.
31. The Licensee shall decontaminate all concrete material remaining on-site to levels of less than or equal to 5 pCi/g total radium. The radioactivity shall be relatively uniformly distributed over the volume of each piece of concrete material. The licensee is not authorized to use decontaminated concrete for backfilling purposes.
32. The licensee shall not perform any treatment of contaminated water.
- A. The licensee is authorized to store contaminated water or use it for dust control purposes. The standard for determining if water is acceptable for dust control are the release limits set forth in (Condition 32. continued)

Table 3 of Appendix B of 32 IAC Part 340 as committed to by the licensee in FMKI-068 dated July 21, 1995. Water from future De-Watering Wells shall not be used for dust control purposes. The licensee shall pump as much water as feasible from the retention pond to maximize storm runoff capacity before using other sources of water for dust control. If water from ponds 2 and 4 are to be used, the water levels should not be drawn down lower than nominally 1 foot above the pond's bottom to minimize obtaining water impacted from contaminated pond sludge. Enough water shall remain in the ponds to completely cover the bottom of the ponds.

* μ Ci-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μ g-microgram; kg-kilogram

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- B. Waste water shall not be discharged until final discharge limits and permit requirements have been reviewed and determined to be acceptable by the Department.
33. For the purpose of the activities authorized by this amendment, the concentration of total residual radium (radium 226 plus radium 228) in dry soil, after removal of soil or other materials that are being relocated, shall not exceed 5 picocuries per gram (5 pCi/g) above background concentrations of those radionuclides. The background concentration of total radium shall be assumed to be 2.2 pCi/g. Concentrations of radium in such residual soils shall be averaged over areas of 100 square meters and averaged over layers of 15 centimeters thickness. The soil concentration of 5 pCi/g is deemed necessary to ensure that the licensee will meet the requirements of 32 Ill. Adm. Code, sections 340.110(b) and 332.170(b) to maintain doses to the public and releases to the general environment as low as is reasonably achievable (ALARA). A case by case demonstration that particular circumstances do not require cleanup to the above-stated goal will be considered.
34. The RSO is responsible for all radiation protection activities, including radiation safety training and respiratory protection training. The RSO may delegate certain duties to specified individuals provided that:
- A. The licensee maintain, for a period of five years, records of all individuals designated by the RSO to perform duties or meet regulatory requirements that would otherwise be required as a duty of the RSO. These records shall include:
1. The name of the individual;
 2. A list of all duties the RSO's designee is authorized to perform;
 3. The date upon which the designation became effective;
 4. The signature of the RSO's designee; and
 5. The signature of the RSO.
- B. The RSO shall review records generated by designees and the performance of designees at least once in each calendar quarter. In addition, the licensee shall maintain records, for a period of five years or until the license is terminated, whichever is earlier, of these quarterly reviews and RSO's designee reviews for IDNS inspection. These records shall include:

* pCi-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; µg-microgram; kg-kilogram

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1. The date of the review;
2. The records being reviewed and the name of the designee being reviewed;
3. A list of all duties performed by the designee;
4. The results of the RSO's review and any corrective measures taken, if applicable, based on the review; and
5. The signature of the RSO.

C. The RSO is responsible for the respiratory protection program.

1. Respirators made available for reissuance or reuse must show no removable contamination (as determined by standard wipe or smear techniques) and no fixed alpha contamination in excess of 100 dpm/100 cm² and no fixed beta-gamma contamination in excess of 1000 dpm/100 cm².
2. Supervisors and/or the RSO shall periodically monitor the use of respiratory equipment to ensure that it is being used when needed and that the equipment is being used properly.
3. At least once every 12 months, users of respiratory protection equipment shall receive refresher training on the proper use of respiratory protection equipment.

35. The licensee is authorized to perform Delineation Drilling as described in the Specific Requests for Approval and subject to the Delineation Drilling Protocol documents dated May 15, 1995, as submitted by letters dated May 16, 1995 (LKI-143) and August 28, 1995 (LKI-183). No drilling outside the designated areas in the above Specific Requests for Approval is allowed.

The licensee shall obtain a grab sample at the bottom of each drill hole and analyze the soil to determine the concentration of Ra-226, Ra-228 and natural uranium (U-234, U-235 and U-238). Records of these analyses must be maintained for inspection by the Department.

36. The licensee shall provide five (5) copies of complete bid packages for each contract for construction activities for phase IIA to IDNS prior to a "notice to proceed" with construction is issued.

* μ Ci-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μ g-microgram; kg-kilogram

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37. The licensee shall provide five (5) copies of the dust control plan and QA/QC plan required for each contractor in the contract specifications to IDNS prior to commencement of phase IIA activities.
38. The licensee shall provide IDNS with an approved, detailed work activities schedule for construction and testing program activities prior to the commencement of phase IIA activities.
39. The licensee is not authorized to use the Physical Separation Facility (PSF) until the Department has determined the PSF Plant Acceptance Procedure Manual (LKI-173) to be acceptable.
40. Any deviations from the scope of decommissioning activities described in the "Environmental Assessment - Phase I" issued April 1994, "Addendum to the Environmental Assessment - Phase I" issued July 1994, "Environmental Analysis Report - Phase IB" issued July 1994; "Environmental Analysis Report - Phase II" issued February 1995 and "Addendum to the Environmental Analysis-Phase II" issued June 1995, including plan drawings and contract documents shall not be implemented until formal approval is received from IDNS.
41. All above grade stockpiles and associated exposed faces of contaminated materials shall be fully covered with geomembranes when activities using the materials are finished for the day.
42. The licensee shall submit a Special Work Permit addressing the removal and replacement of HEPA filters at the incinerator building to the Department for review prior to performing these activities.
43. All accessible areas of the Support Zone shall be surveyed for contamination on at least a weekly frequency. If contamination in excess of the limits specified in 32 IAC 340 Appendix A is detected, the licensee shall decontaminate the area to the specified limits.
44. The licensee shall provide radiation exposure reports to occupationally exposed individuals in accordance with 32 IAC 400.130.
45. The licensee is authorized to conduct stabilization/neutralization operations on a mixing pad with an active area of 3,720 square meters. Active area is defined as the actual area of the pad upon which mixing of contaminated materials is performed. The licensee may construct a larger pad, however, the active area upon which stabilization/neutralization operations are conducted shall not exceed 3,720 square meters.

* μ Ci-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μ g-microgram; kg-kilogram

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46. The Licensee shall not commence backfilling until verification by IDNS is performed and filling of an excavation is authorized.
47. The licensee shall perform verification radiation surveys/sampling for all areas after completion of excavation of contaminated material.
 - A. The verification radiation survey/sampling shall be as specified by the Radiological Verification Plan.
 - B. When excavations extend below the water table, if it is not viable to use the proposed FVS, appropriate samples shall be taken, after the excavation work is completed, and analyzed to verify decontamination of the cleanup standard for unrestricted release. The samples shall be prepared so that the degree of saturation is less than 90 percent.
 - C. Verification shall be performed after each 6 inch layer of backfill is placed within an excavation.
48. The licensee shall perform radiation level surveys on a weekly basis in all accessible areas of the Exclusion Zone.
49. If skin contamination is found in excess of 10,000 counts per minute beta and/or gamma or 1,000 counts per minute alpha, a Health Physics Technician shall be notified to supervise the decontamination.
50. The licensee shall assign a self-reading dosimeter to all temporary employees, visitors, and inspectors at the Facility. Dosimeters must be worn while on the Facility and surrendered before leaving the Facility.
51. The licensee is authorized to ship for disposal up to 20,000 cubic yards of contaminated site material and debris to the Envirocare disposal site during 1996.
52. The licensee is authorized during 1996 to receive and transfer for disposal a maximum of 45,000 cubic yards of off-site contaminated soil and other related contaminated material as described in letter dated January 20, 1995 (LKI-096). Prior to transporting material to the site from off-site locations, the licensee shall submit documentation that depicts the specific location where the contaminated soil and other related contaminated materials are to be stockpiled onsite.
53. If ALARA program goals are exceeded as determined by the quarterly review of the Health Physics Program, proposed corrective action shall be reported to the Facility Safety Committee. Records of

* μ Ci-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μ g-microgram; kg-kilogram

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corrective action and any resulting changes to the ALARA program shall be maintained for inspection by IDNS.

54. A. Below-grade excavation above the water table is authorized subject to the Department approved water management plan for these excavations to handle water collection included in the 1995 Activities Plan document (LKI-155) dated June 12, 1995.
- B. Below water table excavations are prohibited until a water treatment facility has been authorized.
- C. Where excavations occur below the water table, the licensee shall dewater the area to be excavated prior to excavation. The dewatering system shall be capable of (1) prior to excavation, lowering the water table in the area of the excavation to an elevation lower than the base of the excavation, and (2) during excavation, and while the excavation is open, immediately removing any water which accumulates in the excavation. Where excavations occur above the water table, the licensee shall maintain a dewatering system, during the excavation and while the excavation is open, capable of immediately removing any water which accumulates in the excavation.
- D. The licensee is authorized to implement the Excavation Dewatering System described in letter with attachments dated August 5, 1994 (LKI-021). Prior to any installation, the licensee shall submit to IDNS for review the final depths and locations of slurry walls and sheetpiling resulting from the adoption of established soil cleanup standards for release of the site for unrestricted use.
55. The licensee shall implement an approved groundwater monitoring program prior to excavating below the water table. The monitoring program shall be adequate to characterize groundwater moving downgradient from the Facility.
56. The licensee shall establish a corrective measures plan consistent with 32 IAC 332.230 prior to excavating below the water table. The plan shall define what constitutes a significant impact on groundwater and shall provide the specific means and methods that the licensee will use to control groundwater contaminant migration from the Facility if decommissioning activities are determined to have a significant impact on groundwater.

* μ Ci-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μ g-microgram; kg-kilogram

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57. The licensee shall install point of compliance monitor wells at the Facility consistent with 32 IAC 332.230 prior to excavating below the water table. The point of compliance is the site boundary on all sides.
58. A. Each sealed source shall be tested for leakage and/or contamination as specified in 32 Ill. Adm. Code 340.410.
- B. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to use or transfer. If the inspection or test reveals any construction defects, contamination, or the escape of radon in excess of the levels specified in 32 Ill. Adm. Code 340.410(a)(5), (6) or (7), the source shall not be used or transferred until it has been repaired, decontaminated and retested, and the results documented.
- C. Tests for leakage and/or contamination performed by the licensee shall be performed in accordance with the contamination survey and sample counting procedures described in the Health and Safety Plan submitted with the Closure Plan on September 3, 1993. This license does not authorize this licensee to provide leakage and/or contamination tests as a customer service for other licensees.
- D. The records of tests for leakage and/or contamination shall contain the manufacturer, model and serial number, if assigned, of each source tested, the identity of each source radionuclide and its calculated activity as of the date of the test or the activity and activity assay date, the measured activity of each test sample expressed in Bq or μCi , the date the sample was collected, the date the sample was analyzed, the identity of the individual who collected the sample(s) and the identity of the individual who analyzed the sample(s).
59. The dust suppression system located at the discharge chutes and hopper of the temporary dry screen facility shall be used at all times soil is being loaded or discharged.
60. Licensee shall maintain financial surety arrangements as provided in Order No. DIR 94-2. The term of the surety arrangement shall be for the period from issuance of the license until termination of the license by the Department in accordance with 32 Ill. Adm. Code 330.320.
61. The licensee must comply with all requirements, permits, and licenses required by federal, state, and local authorities.

* μCi -microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μg -microgram; kg-kilogram

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62. The licensee shall conduct a physical inventory at intervals not to exceed six (6) months to account for each radioactive calibration standard received and possessed under the license and shall maintain a record of such inventories. The inventory records shall include the radionuclide, activity, activity assay date, manufacturer, model and serial number, the location of the source, date of the inventory and the identity of the individual(s) who performed the inventory. Records of inventories shall be maintained for 5 years from the date of each inventory.
63. The licensee is authorized to ship a nominal 50 tons of contaminated soil from the West Chicago Site to Hazen Research in Golden, Colorado by a licensed carrier. The material may be taken from several areas on site. Hazen shall have approval from their regulatory authority to receive the material prior to shipment from the West Chicago Site. Removal, transportation and testing of the material shall be subject to the Sampling and Test Plan submitted with letter LKI-121. The material is to be used for the purpose of testing in support of the design of the Physical Separation Facility. The material shall be covered when shipped in trucks. The trucks shall be monitored for external contamination and subject to release per site approved procedures for unrestricted use when leaving the site. At the conclusion of the test program the material shall be shipped to the Envirocare disposal facility in Utah.
64. Except as specifically provided otherwise by the license, the licensee shall possess and use radioactive material described in all schedules of this license in accordance with statements, representations and procedures contained in, referenced in, or enclosed with the documents listed below for Phase I, IA, IB, II and IIA activities. The regulations contained in 32 Ill. Adm. Code: Chapter II, Subchapters b and d shall govern unless the statements, representations and procedures in the licensee's application and correspondence are more restrictive than the regulations. The most recent statements, representations and procedures listed below shall govern if they conflict with previously submitted documents.
- A. The Department approved Quality Assurance Manual for Kerr-McGee Chemical Corporation West Chicago Project West Chicago IL.
 - B. Letters with attachments dated October 27, 1993; December 22, 1993; January 26, 1994, February 7, 1994, February 17, 1994, March 14, 1994 (Phase 1), April 24, 1994, April 25, 1994 (dust control), June 13, 1994, June 17, 1994 (sheetpiling), July 8, 1994, July 25, 1994 (Phase 1A), August 26, 1994 (Phase 1B, LKI-029).
 - C. Letter dated September 3, 1993, transmitting the Closure Plan with appendices and the Environmental Analysis.

* μ Ci-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; Td-Terabecquerel; g-gram; μ g-microgram; kg-kilogram

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- D. Letter dated March 14, 1994, with attachments responding to interrogatory numbers 3-1, 16-1, 39-1, 50-1, 51-1, 52-1, 73-1, 178-1, 182-1, 184-1, 185-1, 187-1, 245, 284, 286, 297, 298, 299, and 300.
- E. Letter dated July 21, 1994 transmitting the Decommissioning Sampling Requirements for the Kerr-McGee West Chicago Rare Earths Facility.
- F. Letters dated June 20, 1994, July 7, 1994, and July 8, 1994 relating to responses to interrogatories specific to phase I, IA and IB decommissioning activities.
- G. Letter dated August 3, 1994 (LKI-014) amending section 8 - Testing Program of the July 25, 1994 revised document for Phase IA (Kerr-McGee phase IB) activities.
- H. Letter dated July 28, 1994 (LKI-004), describing calibration standards.
- I. Letter with attachments dated September 15, 1994 and letter dated October 4, 1994 (LKI-044 & LKI-054) pertaining to Concrete Demolition and Decontamination for phase 1B (Kerr-McGee phase 1C) closure activities.
- J. Letter dated October 13, 1994 (LKI-062) responding to third round interrogatories 504 through 544 and letter dated November 1, 1994 (LKI-069) responding to fourth round interrogatories.
- K. Letters dated October 28, 1994 (LKI-068) and March 27, 1995 (LKI-119) regarding the emergency spillway.
- L. Letter dated September 30, 1994 (LKI-051) with attachments regarding the Site Excavation Plan.
- M. Letter with attachment dated April 27, 1995 (LKI-133).
- N. Letter with attachments dated April 18, 1995 (LKI-130) responding to fifth round interrogatories and letter with attachments dated May 26, 1995 (LKI-148) responding to sixth round interrogatories.

* μ Ci-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μ g-microgram; kg-kilogram

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- O. Letter with attachments dated June 12, 1995 (LKI-155) outlining the 1995 Closure Plan Activities accompanied by letters LKI-161, LKI-174 and LKI-177 incorporating specific revisions and corrections.
- P. Letter dated May 3, 1995 (LKI-134) with attached Emergency Plan for the Retention Pond accompanied by letters LKI-150 and LKI-170 incorporating specific revisions and corrections.
- Q. Letter with attachments dated April 28, 1995 (LKI-132) regarding the Physical Separation Facility (PSF).
- R. Letter with attachments dated December 22, 1995 (LKI-215) regarding the Batch Water Treatment Plant (BWTP).
- S. Letter with attachments dated February 17, 1995 (LKI-105) regarding the Water Pretreatment Facility (WPTF).
- T. Letter dated November 22, 1995 (LKI-206) with attachments regarding the Force Main Installation.
- U. Letter dated November 14, 1995 (LKI-204) and January 8, 1996 (LKI-218) regarding radionuclide discharge limits.

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