

DEC 11 1990

Kerr-McGee Corporation
ATTN: J. C. Stauter
123 Robert S. Kerr Avenue
Oklahoma City, Oklahoma

Docket No. 040-08006
License No. SUB-986
Control No. 463398

Gentlemen:

This is to acknowledge receipt of your application for renewal of the special nuclear material license identified above. Your application is deemed timely filed and, accordingly, the license will not expire until final action has been taken by this office.

Any correspondence regarding the renewal application should reference the control number specified and your license number.

Sincerely,

Original Signed By
Billie Gruszynski

William L. Fisher, Chief
Nuclear Materials Licensing Section

RIV:NMLS *BRG*
BRGruszynski:nh
12/11/90

~~C:NMLS~~
~~WLFisher~~
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Information in this record was deleted in
accordance with the Freedom of Information Act.
Exemptions 6
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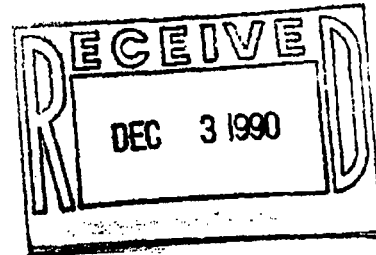


KERR-MCGEE CORPORATION

KERR-MCGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

November 27, 1990

CERTIFIED MAIL
RETURN RECEIPT REQUESTED



U.S. Nuclear Regulatory Commission
Region IV
Material Radiation Protection Section
611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76011

SUBJECT: (1) Application for Renewal
(2) Decommissioning Funding Plan
License No. SUB-986, Docket No. 40-8006
Kerr-McGee Corporation

Dear Sir/Madam:

The application for renewal of the referenced license which expires December 31, 1990, is enclosed.

Financial assurance was provided July 25, 1990 and the Decommissioning Funding Plan is now being submitted with the renewal application in accordance with 10 CFR 40.36. A description of the methods which would be used to adjust the site-specific cost estimate periodically over the life of the facility has not been given since it is planned to decommission the test pits during 1991. We do not anticipate an appreciable change in costs during 1991.

A check in the amount of \$600.00 is also enclosed in payment of the required fee (40 CFR 170.31.2.C).

Sincerely,

J.C. Stauter, Vice-President
Environmental Services

JCS:gw

Attachments

application

0625s

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License No. SUB-986

Amendment No. 08

Docket No. 040-08006

Licensee: Kerr-McGee Corporation



Certification of Application Review for a Part 30, 40, and 70 License

I certify that I have reviewed the application dated November 27, 1990, as supplemented by any letters referenced in the license in accordance with guidance provided by the Office of Nuclear Materials Safety and Safeguards applicable Standard Review Plan and associated checklist and have concluded that:

A. If the license is being terminated, I have received adequate documentation to demonstrate that all radioactive materials and contamination possessed under this license has been properly removed and the licensee's facilities are suitable for unrestricted use, or that the radioactive material is covered by another valid license.

B. For a new license, amendment, or renewal:

- (1) The application is for a purpose authorized by the Act;
- (2) The applicant's proposed equipment and facilities are adequate to protect health and minimize danger to life or property;
- (3) The applicant is qualified by training and experience to use the material for the purpose requested in such manner as to protect health and minimize danger to life;
- (4) The applicant satisfies any special requirements contained in Parts 32-40 and 70; and
- (5) The application is not for commercial waste disposal by land burial or for any other activity which the Commission has determined will significantly affect the quality of the environment.

Senior Health Physicist

Reviewer

FEB 18 1993

Date

Date

APPLICATION FOR MATERIAL LICENSE

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED BY OMB
3180-0120
Expires: 6-30-90

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

APPLICATIONS FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIALS SAFETY SECTION B
831 PARK AVENUE
KING OF PRUSSIA, PA 19406

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
NUCLEAR MATERIALS SAFETY SECTION
101 MARIETTA STREET, SUITE 2800
ATLANTA, GA 30323

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 78011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
NUCLEAR MATERIALS SAFETY SECTION
1460 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94698

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PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

1. THIS IS AN APPLICATION FOR (Check appropriate item)

- A. NEW LICENSE
- B. AMENDMENT TO LICENSE NUMBER _____
- C. RENEWAL OF LICENSE NUMBER SUB-986

2. NAME AND MAILING ADDRESS OF APPLICANT (Include Zip Code)

Kerr-McGee Corporation
Kerr-McGee Center
123 Robert S. Kerr
Oklahoma City, OK 73125

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.

Kerr-McGee Corporation
Technical Center
3301 N.W. 150th Street
Oklahoma City, OK 73125

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

J.C. Stauter

TELEPHONE NUMBER

405/270-2623

SUBMIT ITEMS 5 THROUGH 11 ON 8 1/2 x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL

a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSEE FEES (See 10 CFR 170 and Section 170.25)

FEE CATEGORY AMOUNT ENCLOSED \$ 03.00

13. CERTIFICATION. (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN, IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948, 82 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

SIGNATURE—CERTIFYING OFFICER

TYPED/PRINTED NAME

TITLE

DATE

John C. Stauter

JOHN C. STAUTER

V.P. ENVIRONMENTAL SERVICES

11/27/90

FOR NRC USE ONLY

TYPE OF FEE <i>Ren</i>	FEE LOG <i>Dec 2 1990</i>	FEE CATEGORY <i>2c</i>	COMMENTS	APPROVED BY <i>Mr. Pless</i>
AMOUNT RECEIVED <i>\$600</i>	CHECK NUMBER <i>00234433</i>			DATE <i>12/7/90</i>

RECEIVED

Application for Renewal
Source Material License SUB-986, Docket 40-8006
Kerr-McGee Technical Center

Item 5 - Radioactive Material

A. Type	B. Chemical Form	C. Physical Form (Including % U or Th)	D. Maximum Amount at any one time (kilograms)
Natural Uranium	Ore, U_3O_8 , ADU, UO_3	Solids to 90% U	250 kilograms

E. Maximum Total Quantity of Source Material you will have on hand
at any time (kilograms) 250 kilograms

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Item 6 Purpose(s) for which Licensed Material Will Be Used

The uranium material, primarily ores and ore concentrates, has been blended with natural sands to produce dilute known concentrations of uranium and its daughter products. This material is used as calibration sources for instrument standardization and for instrument research and development.

Most of the blended uranium is buried in sealed test pits located out-of-doors on the 160-acre fenced site approximately 250 yards from the normal working areas. The 160 acres is surrounded by farmland and is conservatively remote from dwellings and other places of business.

The blended uranium is in containment fabricated of 12-gauge galvanized steel, 6 feet in diameter and 12 feet long with welded steel bottoms. The uranium source material is about three feet below grade and is covered by three feet of sand and four inches of concrete. Access to the material is through a center fiberglass tube. A locked steel cover closes the tube when the test pits are not in use. The test pits are appropriately marked with radiation warning signs. Some uranium ore process development studies are also periodically performed.

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Kerr-McGee Technical Center

That portion of source material not in use or in the test pits will be suitably packaged and stored within the building's security fence. These storage locations will be marked with radiation warning signs. Access to radioactive materials is restricted to personnel who are trained to handle them safely. The confined uranium materials pose no significant hazard to the workers or the general public.

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Item 7 Individuals Responsible for Radiation Safety Program and Their

Training and Experience

John M. Carver - Radiation Safety Officer

Education

B.S. in Chemistry (b)(6) Successfully completed the Radiation Safety Specialist Training Program conducted by Oklahoma State University (b)(6) The course consisted of 32 hours of classroom instruction and a four-hour comprehensive examination.

Experience

Industrial experience at Kerr-McGee for 21 years including seven years as supervisor and manager of the uranium and plutonium laboratories at the Cimarron Facility nuclear fuels plant. Served four years as a Senior Environmental Specialist for Kerr-McGee Nuclear and five years as laboratory manager for the Advanced Coal Liquefaction program. Currently serves as Manager, Support Services for the Kerr-McGee Technical Center.

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Item 7 (Continued)

Wilbert J. Robertson, Jr. - Principal Chemist

Education

Bachelor of Science degree in Chemistry. Doctorate in Inorganic Chemistry. Dr. Robertson completed a one-semester course in Radiochemistry at the University of Wisconsin. This course covered the principles of radiation protection, the biological effects of radiation, and mathematics and calculations basic to the use and measurement of radioactivity.

Experience

Measurement techniques and knowledge of instruments were acquired while working at the Weldon Spring plant operated for the Atomic Energy Commission by Mallinckrodt Chemical Works. Isotopes such as Mo 99, P 32, Eu 152-154, Zr-Nb95, Hf 181, As 74, W 185, Th 234, and U 237 were used in chemical tracer studies--generally involving liquid-liquid distribution. These studies were carried out over a period of years and generally involved possession of material from 1-50 mCi depending on the isotope.

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Item 7 (Continued)

James R. Ray - Analytical Chemist

Education

B. S. in Chemistry (b)(6) Courses in Radiochemistry and Gamma Spectrometric Analysis.

Experience

Laboratory experience at Kerr-McGee Technical Center for 22 years. Has served as Laboratory Supervisor of the Radiochemical Section since 1974.

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Item 8 Training Program

Source Materials License SUB-986 applies to Kerr-McGee Technical Center, the research and development facility for the corporation. As a laboratory facility, only relatively small amounts of source material are in use at any given time. All activities are carried out such that no part of the laboratory exceeds the criteria in 10 CFR 20.105, "Permissible Levels of Radiation in Unrestricted Areas, or 10 CFR 20.106, "Radioactivity in Effluents to Unrestricted Areas. Areas where radioactive materials are used or stored are posted with Caution Radioactive Materials signs, as prescribed in 10 CFR 20.203(e)(2). The contents of individual containers or packages of radioactive materials are clearly labeled.

Employees who work with radioactive materials or routinely work in an area where those materials are used will receive instruction in accordance with the requirements of 10 CFR 19.12, "Instructions to Workers." As part of their instruction, these employees will be furnished a copy of Regulatory Guide 8.29, "Instructions Concerning Risks from Occupational Exposure. Female employees will also receive a copy of Regulatory Guide 8.13, "Instruction Concerning Prenatal Radiation Exposure. Almost all of the laboratory personnel have science degrees and completed course work on the nature of radioactivity.

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Item 8 (Continued)

2. A. Training Program Outline Objectives

- ° Minimize personnel exposure to ionizing radiation.
- ° Prevent exposure of non-involved personnel.
- ° Prevent the spread of radioactive contamination.
- ° Maintain radiation levels as low as reasonably achievable.

(1) Use of radioactive materials in designated laboratories minimizes the potential for low-level contamination.

Workers are instructed individually as to the materials being handled. General hazards are discussed; particular emphasis is put on inhalation and ingestion as the most significant sources of potential exposure.

Course Includes Discussion of the Following Topics:

- ° Radiation Types
 - Alpha
 - Beta
 - Gamma
 - Neutron

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Item 8 (Continued)

° Units

- Roentgen (R) -Counts per minute (cpm)
- Rad, Gray -Disintegrations per minute
- Rem, Sievert -per 100cm² (dpm/100cm²)
- Curie (Ci), Becquerel (Bq)

° Biological Effects

- Effects of Acute Dose
- Effects of Chronic Dose

° Working with Radioactive Materials

- Protective Clothing
- No Smoking, Eating, Drinking in Controlled Areas

° Protective Strategies and Devices

- Containment
- Decontamination Methods

° Monitoring for Radiation Exposure

- Film Badge
- TLD
- Dosimeters
- Exposure Records

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Item 8 (Continued)

- ° Personnel Monitoring for Contamination
 - Survey following work with Radioactive Material
 - Bioassay

- ° Facility Procedures
 - Standard Operating Procedures
 - Storage of Radioactive Material
 - Waste Disposal
 - Reporting Unsafe Conditions or Acts
 - Emergencies
 - Posting and Labeling

- ° Radiation Zones
 - Radiation Symbol and Colors
 - Controlled Area
 - Airborne Radioactivity Area
 - Contamination Control Area

- ° Regulation Review
 - Part 19
 - Part 20
 - License Conditions and Requirements

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Item 8 (Continued)

- B. The training course outlined above is presented biannually. An intensive one-day format is used. Actual instruction is five to six hours.
- C. Each participant in the training program will be required to take a written examination. A copy of a sample test is attached as Exhibit 1.
- D. Participation is recorded on an attendance sheet signed by each employee.
- E. The course is given under the direction of Scott C. Munson. See Exhibit 2 for his qualifications.

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Item 9 Facilities and Equipment

Figure 1 is a floor plan of the laboratory building. Laboratory room E30 is used for chemical work involving the use of radiotracers. The use of radioisotopes is authorized under our Byproduct License 35-12636-06.

Laboratory room E8 has previously been used for uranium work. Room C23 currently houses the counting equipment. The pilot plant area and other locations may contain small quantities of ores or compounds of source material at one time or another for analysis or research and development work.

Most laboratory rooms and areas are equipped with fume hoods. Glove box equipment is also available. Containment, ventilation controls and safe operating procedures preclude the need for wearing respiratory protective equipment while handling source materials, except under emergency conditions such as an accidental spill or fire.

Figure 1 maps the locations where general safety and emergency equipment is located within the laboratory. Personnel are trained to properly use this equipment when needed. An inspection and maintenance program effectively keeps this equipment in readiness.

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Item 10 Radiation Safety Program

The instrument calibration test pits are surveyed by visual inspection to determine proper safeguarding and posting. The condition of the containment and associated earthwork and structures are also evaluated. This inspection is conducted annually. The values of low dose rates above and near the test pits are known. The handling of more than sample amounts of uranium at one time is unusual. Should the need for handling larger quantities of uranium occur (such as blending new mixtures for the test pits), the appropriate health physics procedures will be followed.

In case of an accident causing a spill of source material, the affected area will be placed in a shut-down mode until decontamination procedures are accomplished and surveys are conducted proving the area suitable for reuse. Physicians knowledgeable in the fields of Health Physics and Nuclear Medicine located in Oklahoma City are available to render service in the event of an emergency.

The Kerr-McGee Technical Center has a well organized safety program with strong corporate support. The program includes active participation of all employees, supplemented by persons with special safety and industrial hygiene skills, safety committee, and a trained emergency Squad. Employees are trained on how to sound the emergency alert, how to protect themselves, evacuate and assemble in a safe location. The Emergency Squad is especially trained in rescue and first aid. A staff of skilled health

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Item 10.2 (Continued)

physicists and health technicians (and their equipment) from Kerr-McGee Corporation's nuclear facility nearby can be called upon for assistance.

The Kerr-McGee Technical Center maintains a radiation safety program which is designed to monitor the adequacy of the containment and control provisions for radiological safety purposes.

Item 10.1 Personnel Monitoring Devices

An established personal dosimeter program is in place. Film badges are issued to individuals who work with significant sources of ionizing radiation. The badges are processed at monthly intervals by R.S. Landauer Company.

Item 10.2 Bioassays

Bioassay procedures are not considered as a routine monitoring tool because of the very limited opportunity for any significant internal exposure to occur. In the unlikely event of an accidental exposure, bioassay and medical management programs will be instituted. Bioassays will be performed by the collection of urine samples when indicated by the investigation of a reported spill or the results of air samples which are greater than or equal to the MPC value given in 10 CFR 20, Appendix B, Table I, Col. 1.

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Item 10.2 (Continued)

A. Urinalysis

An employee submitting a urine sample which analyzes above 100 ugU/l will be placed on immediate work restriction (non-uranium work). Resampling is done daily with voidings given at home prior to coming to work. A resample with results 20 ugU/l, releases the employee from work restriction.

An employee submitting a sample >20 ugU/l but <100 ugU/l is placed on daily resample schedule until a sample result is <20 ugU/l. The employee is placed on work restriction if the first resample is >20 ugU/l. He is released from work restriction whenever a subsequent daily resample analyzes <20 ugU/l.

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Item 10.3 Surveys and Monitoring

Areas in the facility where radioactive materials are used are surveyed on a bimonthly basis using an alpha survey meter and a beta-gamma survey meter.

- A. Alpha action levels for bench tops, hoods and floors are 200 dpm/100cm² smearable and 1,000 dpm/100cm² fixed.

The beta/gamma action level is 2 mR/hr measured at 18 inches from the surface of interest.

- B. Where source material is being used, an alpha survey meter is dedicated for personnel contamination surveys and daily area monitoring by the worker(s) involved. This type of monitoring ensures decontamination and cleanup on a timely basis. Individuals who work with radioactive materials are supplied with film badges or TLDs which are processed monthly.
- C. Storage areas are surveyed on a bimonthly basis as part of the routine facility survey. There are no disposal sites at the facility.

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Item 10.3 (Continued)

D. Effluent Monitoring

Effluents from the facility are as low as reasonably achievable. Gaseous or particulate effluents are of a fugitive nature. When the possibility exists of such effluents, air monitoring is undertaken to monitor the amount of material lost in this fashion. In earlier studies involving uranium ore handling, air monitoring showed values below that specified for an unrestricted area. Duct systems are not surveyed.

Operations involving gaseous materials will be monitored for fugitive emissions. Operations involving solutions are carried out over catch pans which are monitored and cleaned as required. Operations involving fine particulates are monitored if there is reasonable likelihood of fugitive emissions.

E. Monitoring for airborne activity is carried out when there is a reasonable likelihood that such contamination could exist (i.e., when operations involve materials that could lead to airborne activity).

F. Air samples will be obtained from work areas when the potential for airborne contamination exists. Samples will be collected from the

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Item 10.3 (Continued)

work area so as to be representative of the airborne concentrations to which the workers are exposed. Samples will be analyzed radiometrically and the activity per unit volume of air determined. The appropriate maximum permissible concentration given in 10 CFR 20, Appendix B, Table I will be used to compute the MPC-hour exposures for each worker. Worker exposures to airborne sources will be maintained at levels as low as is reasonably achievable and will not be allowed to exceed 500 MPC-hours per quarter.

- G. Where there is potential for release of airborne radioactive material, the effluent air will be sampled through a collector for counting.

Some very low concentrations of liquid radioactive waste may be discharged to the sanitary sewer. Such discharges comply with 10 CFR 20.303. This stream is monitored to comply with the wastewater discharge permit issued by Oklahoma City.

Item 10.4 Radiation Detection Instruments and Calibration

Survey and monitoring instruments include an Eberline E-120 beta-gamma instrument (0-50 mr/hr, 30 mg/cm² window), and a Ludlum 12 alpha survey meter. These instruments are tested for proper function with a check

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Item 10.4 (Continued)

source prior to use and are calibrated semi-annually and after repairs. The calibration is performed by health physics personnel at the Kerr-McGee Cimarron Facility, License No. 35-12636-02, using calibration sources traceable to the National Bureau of Standards.

Survey meter calibration records are retained indefinitely. No records have ever been discarded. Such records will be retained for a minimum of two years.

Item 10.5 Radiation Safety Procedures

An outline of the existing radiation safety program as provided below in accordance with the information specified in Item 10.5 of Revision 2 of Regulatory Guide 10.4. The program is included in the facility safety manual which is reviewed and updated periodically.

A. Radiological Safety at the Technical Center

- (1) Need for program
- (2) Protection principles
- (3) Legal basis and regulatory requirements

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Item 10.4 (Continued)

B. Organization of Radiation Safety

The Technical Center Facility Manager is responsible for the radiological safety of employees at the Technical Center. He is assisted by the Radiation Safety Officer in this responsibility.

The duties of the Radiation Safety Officer are:

- 1) To insure that employees handling radioactive material have all necessary administrative and technical instructions concerning radiation hazards and safe working practices. This includes 10 CFR 19 briefing.
- 2) Radioactive material is nominally under the control of the Radiation Safety Officer, and an inventory shall be maintained of such material. In order to maintain this inventory, purchase orders for radioactive materials will be reviewed by the Radiation Safety Officer.
- 3) Personnel monitoring and area monitoring programs will be the responsibility of the Radiation Safety officer.
- 4) Licensing activities and compliance with other legal requirements will be the responsibility of the Radiation Safety Officer.

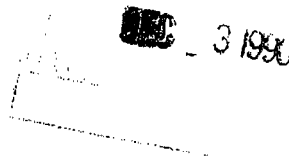
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Item 10.5 (Continued)

- 5) Review of arrangements for safe disposal of radioactive waste will be a responsibility of the Radiation Safety Officer.

C. Radiation Monitoring Programs

- (1) Basis and need
- (2) Personal dosimeters
- (3) Area Monitoring



D. Personnel Monitoring

- (1) Detailed procedures for badge issue and processing

E. Area Monitoring

- (1) Detailed procedures and action levels
- (2) Calibration requirements
- (3) Air monitoring
- (4) Sealed source testing
- (5) X-Ray equipment

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Item 10.5 (Continued)

F. General Procedures

- (1) Procedure for highly radioactive samples
- (2) Personal protective measures
- (3) Contaminated equipment or materials
- (4) Waste disposal
- (5) References

Item 11

Source material waste is generated only periodically and in small amounts. It is disposed of by using procedures compatible with 10 CFR 20.303 and by disposal at an approved burial site.

EXHIBIT 1

Radiation Protection Quiz
Kerr-McGee Technical Center

Name: _____

Grade: _____

1. Specify for the following types of radiation the appropriate penetrating ability and hazard potential:

<u>Radiation Type</u>	<u>Penetrating Ability</u> <u>(low, medium, high)</u>	<u>Hazard Potential</u> <u>External, Internal)</u>
Alpha		
Beta		
Gamma		

2. A film badge or TLD is used to measure:

- a. the radiation exposure rate around an alpha emitting source.
- b. the radiation dose received by an individual.
- c. the airborne radioactivity concentration in a work area.

3. Explain what ALARA means.

4. Match the following types of radiation with the appropriate measurement technique and considerations:

a. Alpha _____ Monitored with either ion chamber, GM or properly calibrated NaI scintillation instrument.

b. Beta

c. Gamma _____ Measured directly on dry, flat surfaces using gas proportional or scintillation detectors.

_____ May only be measured using ion chamber instruments. Other instruments such as a thin-end window GM instrument will detect this radiation.

5. The activity of an iodine-131 sample is known to be 100 mCi today. What will the activity be 16 days from now. (Hint: The half-life for iodine-131 is 8 days)
6. Match the following types of biological effects with the appropriate definition for each:
- a. Prompt Somatic Effects _____ Abnormalities that may occur in the future children of exposed individuals and in subsequent generations.
- b. Delayed Somatic Effects _____ Observable soon after a large or acute dose (eg. 100 rads or more to the whole body in a few hours)
- c. Genetic Effects
- d. Teratogenic Effects _____ Observed in children who were exposed during the fetal and embryonic stages of development.
- _____ Effects such as cancer that may occur years after exposure to radiation.
7. Portable radiation survey instruments generally cannot be used for detecting tritium. Wipes are the usual means of surveying for tritium contamination of surfaces. Explain why.

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Kerr-McGee Technical Center

EXHIBIT 2

SCOTT C. MUNSON, Sr. Staff Environmental Specialist

EDUCATION

Bachelor of Science Degree in Civil Engineering from North Dakota State University in (b)(6)

Radiation Safety training consists of courses in Regulatory Practices and Procedures, Inspections, and Radiological Emergency Response Planning, conducted by the U.S. Nuclear Regulatory Commission at Silver Springs, Maryland; Glenn Ellyn, Illinois; and the Nevada Test Site. Additional training in Health Physics and Radiation Protection programs was obtained at Oak Ridge Associated Universities, John Hopkins University, Louisiana State University, Colorado State University, and the University of Lowell.

EMPLOYMENT DATA

North Dakota State Health Dept.,	Environmental Engineer	1975-1977
Radiation and Noise Programs	Manager	1977-1979

Application for Renewal
Source Material License SUB-986, Docket No. 40-8006
Kerr-McGee Technical Center

Kerr-McGee Chemical Corp.	Health Physicist	1979-1981
West Chicago Rare Earths Facility	Manager, Quality Assurance	1981-1983
Kerr-McGee Corporation	Senior Staff	1983 -
Department of Nuclear Licensing & Regulation, Environment & Health Management Division	Environmental Specialist	Present

PROFESSIONAL ORGANIZATIONS & COMMITTEES

Certified by American Board of Health Physics in, 1988.

Health Physics Society - Member

American National Standards Institute Committee N13, Radiation
Protection - Member

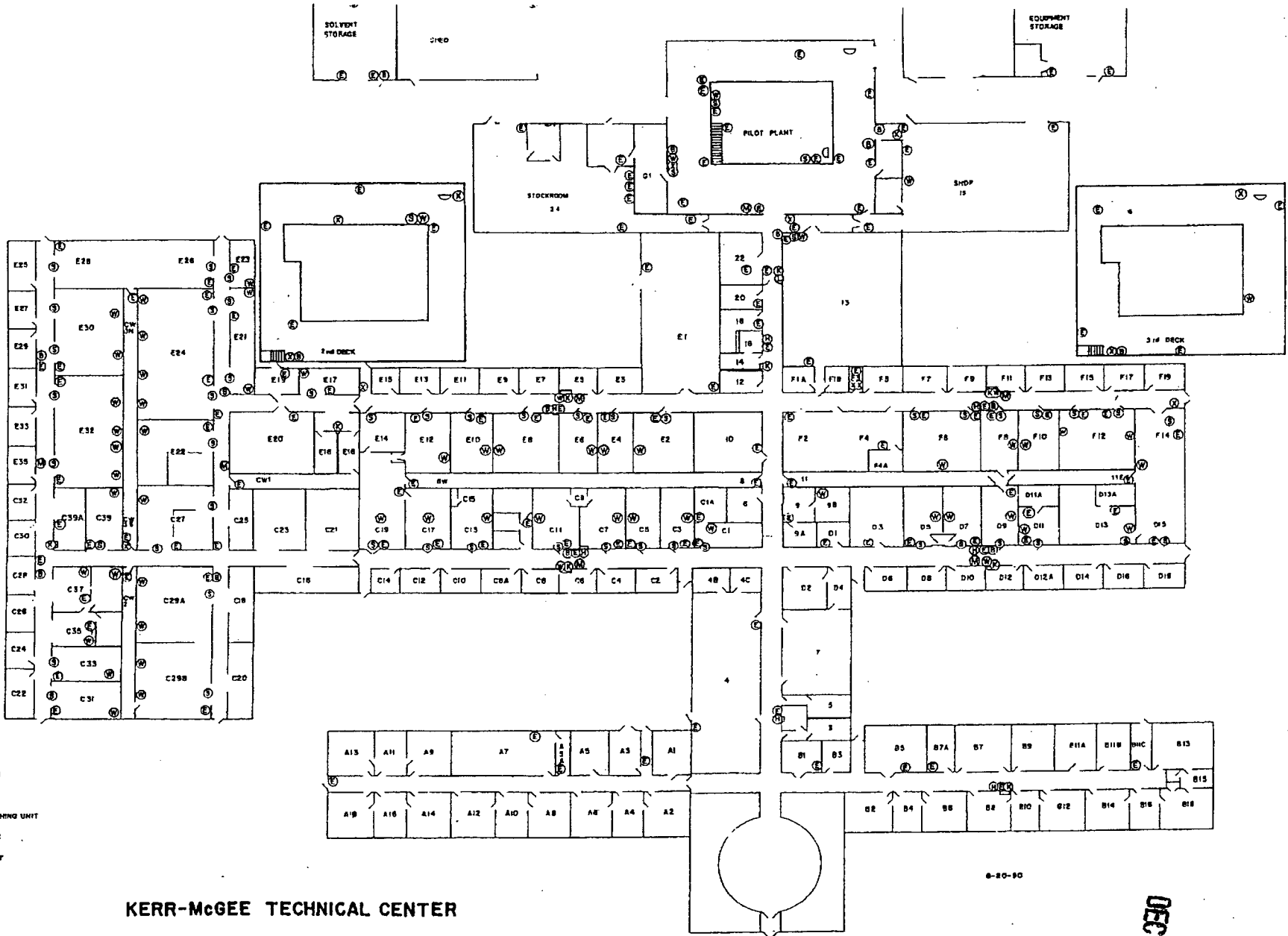
American Petroleum Institute - Member of NORM Committee

8. The Nuclear Regulatory Commission regulations require that a licensee post current copies of all but which of the following:
- a. 10 CFR Parts 19 and 20
 - b. License, license conditions, referenced documents and amendments
 - c. Employee radiation exposure reports
 - d. Operating procedures
 - e. Any notice of violation
 - f. NRC Form 3, "Notice to Employees"
9. Match the following radiation dose standards (rems Per quarter) for individuals in restricted areas with the appropriate organ(s):
- a. 1.25 ___ Whole body, head and trunk, active blood forming organs, lens of eyes or
 - b. 7.5 ___ gonads.
 - c. 18.75 ___ Hands and forearms, feet and ankles.
 - ___ Skin of whole body.
10. Although the risks to the unborn child are small under normal working conditions, it is still advisable to limit the radiation dose from occupational exposure to no more than _____ millirems for the total pregnancy.
- a. 1250
 - b. 500
 - c. 100
 - d. 25

11. Contamination control is important when working with loose forms of radioactive materials in order to avoid internal exposure of personnel. Briefly discuss several methods used to control and monitor contamination.
12. Nuclear gauges located in the Rose Unit use gamma radiation emitted from cesium-137 sources to measure the density of material. What three basic radiation principles may be used to protect people when working around gamma emitting sources such as these gauging devices. Briefly explain how each principle is used to control external radiation exposures.
13. Which of the following most closely describes what is known about the biological effects of low level radiation exposures:
- a. A strong relationship between exposure and effect is apparent at low levels of occupational radiation exposure.
 - b. At the relatively low levels of occupational radiation exposure, it is difficult to demonstrate a relationship between exposure and effect.
 - c. People exposed to low level radiation will develop acute radiation syndrome.
 - d. Since the effects of exposure to low levels of radiation are clearly demonstrated, there is no need to extrapolate from the effects which are seen at high radiation levels.

4. What types of radiation will be emitted from radionuclides present in the Th-232 decay series.

15. Explain why alpha radiation is not considered to be a significant health hazard if kept outside of the body.



- LEGEND**
- ESCAPE LADDER
 - ⊕ FIRE EXTINGUISHER
 - ⊖ FIRE HOSE
 - ⊙ FIRE BLANKET
 - ⊗ FIRST AID KIT
 - ⊘ EMERGENCY BREATHING UNIT
 - ⊙ STRETCHER
 - ⊙ EYE WASH STATION
 - ⊙ SAFETY SHOWER
 - ⊙ MEDICAL ALERT

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