KERR-McGEE CORPORATION
KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

July 22, 1986

ENVIRONMENT AND HEALTH MANAGEMENT DIVISION

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Jack E. Whitten
Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

Re: License SUB-986
Docket 040-08006

Dear Mr. Whitten:

Source Material License SUB-986, issued to Kerr-McGee Technical Center in Oklahoma City was renewed on December 23, 1985, for another five years, with an expiration date of December 31, 1990.

This letter is to inform you that John M. Carver, Manager, Support Services of the Kerr-McGee Technical Center, should be added to the license as a user of licensed material. Mr. Carver will replace W.J. Robertson as Laboratory Radiation Protection Officer; however, Mr. Robertson will continue to be licensed as a User of Byproduct Materials.

Accordingly, Item 11 of the license should be changed to read:

11. Licensed material should be used by, or under the supervision of, Garet E. Van de Steeg, Wilbert J. Robertson, Jr., Robert E. Leonard, Scott C. Munson, or John M. Carver.

Mr. Carver's resume is attached for your information, and a check in the amount of $150 is enclosed to cover payment of the required amendment fee.

If you have any questions, please call me at (405) 270-2623.

Sincerely,

J.C. Stauter

J.C. Stauter, Director
Nuclear Licensing & Regulation

Attachments: (2) As Stated

License Fee Information on next p.

D/2

UL 11811

John M. Carver

Education

B.S. in Chemistry (b)(6). Successfully completed the Radiation Safety Specialist Training Program conducted by Oklahoma State University (1986). The course consisted of 32 hours of classroom instruction and a four-hour comprehensive examination.

Experience

Industrial experience at Kerr-McGee for 17 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.

Log Jul-6-10
Remitter
Check No. 00082482
Amount $120
Fee Category 2G
Type of Fee Amdt
Date Check Rec'd. 7/31/86
Date Completed 7/31/86
By:

4/6/1880

KERR-McGEE TECHNICAL CENTER

Source Material License SUB-986
Docket 40-8006

Listed below are the responses to the questions raised in the letter of July 15, 1985, from Jack E. Whitten, USNRC, Region IV.

1. 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.

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 Outline:

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

- Units

  -Roentgen (R)

  -Rad, Gray

  -Rem, Sievert

  -Counts per minute (cpm)

  -Disintegrations per minute per 100cm^2 (dpm/100cm^2)

  -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

- 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

B. The training course outlined above is presented biannually. An intensive one-day format is used. Actual instruction is five to six hours.

Also presented periodically is the American Chemical Society course, taught from cassettes, on Radiochemistry. This class typically meets for one hour, twice a week for six weeks. A workbook is supplied to all course participants.

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 will be presented by Scott C. Munson. See Exhibit 2 for his qualifications.

3. 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.

A. Urinalysis (Except UF_6)

An employee submitting a urine sample which analyzes above 100 µgU/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 µgU/l, releases the employee from work restriction.

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

B. Special Urinalysis for UF_6 Exposures

Inhaled uranium from UF_6 and UO_2F_2 exhibits a very rapid urinary excretion half time. The model for standard man indicates an elimination half-time of 6 hours. For different individuals it is not unusual to have half times of 4 hours to 7 hours. Accordingly, urine samples must be obtained within a few hours of such an intake in accordance with the following sampling and analysis procedure:

(1) Personnel should void their urine, emptying the bladder, as soon as possible after the UF_6 release. They do not collect a sample of this voiding.

(2) Personnel are to collect a urine sample about 4 hours after the exposure to UF_6. (A sample collected 3-6 hours past exposure is acceptable.) They shall use clean sample bottles obtained from the Rad. Safety Officer. They shall mark the bottle label with the badge number and the date and time the sample was voided.

(3) The persons next normal voiding time will be about 8 hours from the time of the exposure incident. This voiding should be discarded (not collected).

(4) Collect the second sample by voiding urine about 12 hours after the exposure. (12 hours is preferred, however a sample submitted no later than 20 hours after the incident is acceptable). Record the employee number, date and time of this sample collection on the bottle label.

(5) Return the two sample bottles to the Rad. Safety Officer.

(6) The Rad. Safety Officer shall make a record including the date and time the incident occurred and the names of the persons who are to submit special urine samples.

(7) The R.S.O. shall record the label data from the sample bottles and deliver the samples to the laboratory for fluormetric analysis. The laboratory shall report their findings to the Rad. Safety Officer in terms of µgU/l.

(8) Each two sample values are plotted on semi-log paper (µgU/l vs hours after exposure). Connect the two plot points with a line and extrapolate the line back to time zero. Determine the µgU/l value at the 4 hours intercept and calculate the MPC-hr exposure as follows:

MPC-hrs = 0.0055C

where C = µg/l value from 4 hour intercept plot point on semi-log paper

(See Exhibit 3 for the derivation of the constant value 0.0055)

4. 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/100cm^2 smearable and 1,000 dpm/100cm^2 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 clean-up 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. There are no filters for radioactive materials. Effluents from the facility are as low as reasonable achievable. Intentional discharges to the sanitary sewer are below that authorized in 10 CFR 20.303. 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.

D. 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).

Activity in water effluents is monitored as part of the waste water discharge permit issued by Oklahoma City.

General area surface contamination surveys are performed at a bimonthly frequency using an alpha survey meter. Where source material is being used, immediate work area, surface contamination surveys will be performed on a daily basis.

F. Air samples will be obtained from work areas when the potential for airborne contamination exists. Samples will be collected from the 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 in no case will 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.

While liquid radioactive waste is recycled to the feed materials plant operated by Kerr-McGee, some very low concentrations 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.

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

6. Radiation Safety Program

An outline of the existing radiation safety program is provided below. This program is being revised by the facility RSO in accordance with the information specified in Item 10.5 of Revision 2 of Regulatory Guide 10.4 The program will be included as part of a new facility safety manual which will be completed by June of 1986.

A. Radiological Safety at the Technical Center

(1) Need for program

(2) Protection principles

(3) Legal basis and regulatory requirements

B. Organization of Radiation Safety

The Technical Center Director 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.

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

F. General Procedures

(1) Procedure for highly radioactive samples

(2) Personal protective measures

(3) Contaminated equipment or materials

(4) Waste disposal

(5) References

EXHIBIT 1

Radiation Protection Technology Quiz

1. Approximately how many times larger is the diameter of the atom than it's nucleus?

2. What word denotes elements with the same atomic number, but with different atomic masses?

3. How are the A and Z numbers of an atom affected when -

   a. An alpha is emitted?

   b. A beta particle is emitted?

4. What is the half-life when the decay constant (λ) is 0.01/day?

5. How many neutrons are in an atom of Thorium-232?

6. A sample has an activity of 2.22×10^6 dis/min. What is it's activity in microcuries?

7. About how many electron volts (eV) are needed to form an ion-pair in air?

8. The chemical product of irradiation of water in a tissue cell which is damaging to the cell is:

9. The first component of blood to show the effects of radiation exposure is the:

10. Alpha radiation is not harmful outside of the body because:

11. The occupational whole body radiation dose to females during pregnancy should not exceed:

12. Genetic alterations of daughter cells may be caused by radiation damage to:

13. What radiations may be expected from the Thorium-232 chain?

14. What are three methods used for protection against x-rays and gamma radiation?

15. The rem is the product of the absorbed dose rad and the quality factor Q. What does the quality factor account for?

16. What device will a person wear which will detect and integrate exposure dose from ionizing photons?

17. The MPC is an air concentration value which must never be exceeded - True or False?

18. At one foot from a gamma source, the radiation intensity is 180 mR/hr. What is the radiation intensity at 3 feet from the source?

19. The "critical" organ for insoluble forms of radioactive material is the:

20. List precautionary measures which are to be taken to prevent internal exposures from radioactive materials.

EXHIBIT 2

RESUME

Training and Experience

SCOTT C. MUNSON

Mr. Munson received a Bachelor of Science Degree in civil Engineering from North Dakota State University in (b)(6) He has had extensive radiation safety training since that time.

His training consists of 280 hours in courses in Regulatory Practices and Procedures, Inspections, and Radiological Emergency Response Planning, conducted by the U.S. Nuclear Regulatory Commission at Silver Springs, Maryland, Glen Ellyn, Illinois, and the Nevada Test Site.

Additional training consists of more than 500 hours in Health Physics and Radiation Protection programs, Industrial Radiography, and Air Pollution Control at Oak Ridge Associated Universities, John Hopkins University, Louisiana State University, Colorado State University, and the University of Lowell.

Mr. Munson worked as an Environmental Engineer at the North Dakota State Health Department in their Radiation and Noise Programs from 1975 to 1977 and as Manager of the Programs from 1977 to 1979.

He was employed by Kerr-McGee Chemical Corporation as Health Physicist at the West Chicago Rare Earths Facility in West Chicago, Illinois in 1979 and became Manager of Quality Assurance at the facility in 1981.

Mr. Munson has been employed as Senior Staff Environmental Specialist in the Environment and Health Management Division, Department of Nuclear Licensing and Regulation, Kerr-McGee Corporation, Oklahoma City, Oklahoma, since 1983.

EXHIBIT 3

Purpose: Derivation of the constant value of 0.0055 used in the bioassay procedure for calculating the exposure from an acute inhalation of UF_6.

Discussion: Inhalation of $UO_2F_2 \cdot HF$ leads to very little organ uptake of uranium. Practically all of this uranium is eliminated from the body within one day. An early recommendation was made in ICRP publication No. 6, paragraph (52F) that the inhalation of soluble uranium should not exceed 2,500 micrograms in one day. Considering the transfer compartment model and the metabolic data given for uranium in ICRP publication No. 30, Part 1, it is seen that about 37% of that inhaled is exhaled and about 15% is eliminated in the feces. This leaves 48% passing to the urine.

The standard man excretes 1.4 liters of urine per day. We will assume that a urine elimination is performed each four hours during the day. One voiding then, has a volume of 233 ml.

Elimination Equations (For an inhalation of 2,500 μg of uranium)

A. Of 2,500 μg of uranium inhaled 48% or 1,200 μg will eventually reach the urine at a rate of 0.115 per hour.

1. $2{,}500\ \mu g \times 0.48 = 1{,}200\ \mu g = q_{\infty}$

2. $\lambda = \ln 2/T\text{-}1/2 = 0.693/6\ hr = 0.1155/hr$

B. The uranium accumulated in urine during the 4 hour period following intake = 4 hrs

$$q_{o \to t} = (1 - e^{-\lambda t})$$

$$q_{o \to 4} = 1{,}200\ \mu g\ (1 - e^{-0.1155(4)}) = 444\ \mu g$$

C. The concentration of uranium in the first (4 hour) urine sample is: 444 µg/233 ml = 1.9 µg/ml = 1900 µg/l.

Exposure Estimate Equations

The MPC-hr estimate is calculated as follows:

$$\text{MPC-hrs} = \frac{(2{,}500\ \mu g)\ C}{(1{,}900\ \mu g/l)(1.2\ m^3/hr)(200\ \mu g/m^3\text{-MPC})}$$

MPC-hrs = 0.0055C

C = µg/l of uranium in urine four hours after an acute inhalation of UF_6.

1.2 m^3/hr = breathing rate

200 $\mu g/m^3$ = MPC(a) (see footnote No. 4 Appendix B of 10 CFR 20)

SEP 30 1985

Kerr-McGee Corporation
ATTN: J. C. Stauter, Director
Nuclear Licensing and Regulations
123 Robert S. Kerr Avenue
Oklahoma City, Oklahoma 73125

Docket No. 040-08006
License No. SUB-986
Control No. 424052

Gentlemen:

We are in receipt of your letter dated September 19, 1985, in which you requested additional time to respond to our letters of July 15 and August 26, 1985. Your request for extension is granted. If you have not responded by October 28, 1985, your license will be terminated, requiring that you divest yourself of all licensed materials.

Sincerely,

Original Signed By
R. J. Everett

R. J. Everett, Chief
Nuclear Materials Safety Section

NMSS
JAMarshall:df
9/26/85

C:NMSS
RJEverett
9/26/85

T1

KERR-McGEE CORPORATION
KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

ENVIRONMENT AND HEALTH MANAGEMENT DIVISION

September 19, 1985

FEDERAL EXPRESS

Mr. Jack E. Whitten
Nuclear Materials Safety Section
Region IV
U.S. Nuclear Regulatory Commission
Parkway Central Plaza Building
611 Ryan Plaza Drive
Suite 1000
Arlington, Texas 76011

RE: License SUB-986
Docket 040-08006
Control Number 424052

Dear Mr. Whitten:

Please refer to: (1) your letter of July 15, 1985, requesting additional information on the subject license renewal application; and (2) Mr. R.J. Everett's letter of August 26, 1985, requesting the above response within 30 days. This letter confirms your conversation today with Maybelle Landagora of this office concerning the above.

We find it necessary to request an additional 30 days (October 26, 1985) to submit the requested information due to an unusually heavy work load and a limited number of personnel available at this time.

The requested information will be submitted in full by October 26, 1985.

Thank you for your consideration of this request.

Sincerely,

J.C. Stauter

J.C. Stauter, Director
Nuclear Licensing & Regulation

JCS:ML/br

424052

AUG 26 1985

Kerr-McGee Corporation
ATTN: J. C. Stauter, Director
Nuclear Licensing and Regulations
123 Robert S. Kerr Avenue
Oklahoma City, Oklahoma 73125

Docket No. 040-08006
License No. SUB-986
Control No. 424052

Gentlemen:

This refers to your request for renewal of Byproduct Material License No. SUB-986 and our request for additional information dated July 15, 1985, a copy of which is enclosed. A check of our files indicates that we have not received a response from you to date. If we do not receive a reply within 30 days, it may be necessary to deny your application and terminate your license. Such action would require that you divest yourself of all licensed material.

Sincerely,

Original Signed By
R. J. Everett

R. J. Everett, Chief
Nuclear Materials Safety Section

Enclosure:
Letter dated July 15, 1985

NMSS
JAMarshall;df
8/21/85

C:NMSS
RJEverett
8/22/85

8602110499 851223
REG4 LIC40
SUB-0986 PDR

NMSS:JEW
Control No. 424052

JUL 15 1985

Kerr-McGee Corporation
ATTN: J. C. Stauter, Director
Nuclear Licensing and Regulations
123 Robert S. Kerr Avenue
Oklahoma City, Oklahoma 73125

Gentlemen:

This is in reference to your request for a byproduct material license renewal in the name of Kerr-McGee Corporation. In order for us to complete our review of your request, please supply the following:

OK 1. All personnel whose duties may require them to work in/around or to visit a restricted area need to be informed about radiation hazards and appropriate precautions upon being hired and at least annually thereafter. Outline your training program to be given to the above employees to assure conformance with 10 CFR 19.12.

OK 2. A. Provide an outline showing your training objectives and the topics (with major subheadings) covered in Kerr-McGee's training program given to all employees working under the supervision of Messrs. Robertson, Van De Steeg, Leonard, or Sinke under the auspices of the SUB-986 license. The extent of instruction should be commensurate with potential radiological problems in your restricted areas and should include at least the following topics:

- Identification of licensed radioactive materials and radiological hazards present in the restricted area to be entered by the individual.
- Precautions and procedures to minimize exposures and the spread of contamination.
- Purposes and functions of protective devices required.
- Applicable NRC regulations to be observed by individuals working in or frequenting restricted areas.
- Terms of NRC licensed applicable to employees working in or frequenting restricted areas.
- Standard operating and emergency procedures to be followed by individuals working in or frequenting restricted areas.

NMSS
JEWhitten;df
7/10/85

C:NMSS
RJEverett
7/11/85

Dupe 8602110486

- Responsibility of individuals to report unsafe acts or conditions observed in restricted areas.
- Rights of employees to receive radiation exposure reports upon request.
- For persons who actually work with radioactive material, instructions for the safe use of radioactive material.

B. Duration and frequency of training.

C. Means for testing the comprehension of participants, i.e., practical exercise, oral test, or written test (include a sample).

D. Method for recording participation.

E. Name, title, and qualifications of the individual responsible for conducting the training.

3. Describe your bioassay program, including the type of bioassay, Kerr-McGee criteria for performing bioassays, frequency bioassays are to be performed, and action to be taken when positive results are obtained. Review of Regulatory Guide 8.11 (enclosed) should be helpful in determining the type and scope of bioassay program needs at your research and development operations.

4. Describe your survey and monitoring program guidelines; action levels and frequencies for performing surveys of the following applications; and areas of use:

A. Laboratory and plant areas (e.g., checking for contamination on bench tops, handling and storage equipment, clothing, hands).

B. During work with radiation or radioactive materials (e.g. airborne contamination or personnel exposure measurements, including extremities).

C. Areas associated with storage; disposal sites and containers; liquid, gas, and particulate effluents; filters; and duct system.

D. Operations involving gasified, liquid, or finely divided forms.

E. Surveys and monitoring for airborne concentrations in restricted and unrestricted areas; for concentrations in air and water effluents released to unrestricted areas; and for surface contamination of personnel, facilities, and equipment.

F. Air sampling programs, describing the areas where samples will be taken, the frequency of sampling, and the location of the sampler with respect to restricted and unrestricted areas and work areas. Describe the type of assays to be performed to evaluate air samples and the methods used to relate results to actual personnel exposures.

G. Effluent monitoring programs for all airborne and liquid radioactive material releases to unrestricted areas.

5. Your renewal application should be amended to include a statement addressing the retention time of survey meter calibration records. The NRC feels that these records should be maintained for a minimum of 2 years.

6. Provide an outline of your radiation safety program listing the information specified in Item 10.5 of Revision 2 of Regulatory Guide 10.4.

We will continue our review of your application upon receipt of this information. Please reply in duplicate and refer to Control No. 424052.

Sincerely,

Original Signed By.
Jack E. Whitten

Jack E. Whitten
Nuclear Materials Safety Section

KERR-McGEE CORPORATION

KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

ENVIRONMENT AND HEALTH MANAGEMENT DIVISION

RECEIVED

'85 SEP -3 P1:25

U.S. N.R.C.
L.C. FEE MGMT. BRANCH

August 6, 1985

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Jack Whitten
Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

Re: License SUB-986
Docket 40-8006

Dear Mr. Whitten:

We wish to inform you that Scott C. Munson, Senior Staff Environmental Specialist for Kerr-McGee Corporation, has assumed the responsibilities previously performed by Mr. Gerald J. Sinke on the referenced license issued to the Kerr-McGee Technical Center. Mr. Sinke has retired. A resume outlining Mr. Munson's background, experience, and training is enclosed for your information.

A check in payment of the required amendment fee for the license is also enclosed. Should you require additional information, please let me know.

Sincerely,

J.C. Stauter

J.C. Stauter, Director
Nuclear Licensing & Regulation

Enclosures: As Stated

JCS:ML/br

Sept - IV

Applicant.
Check No. 048013
Amount/Fee Category 9. 130 - 2B (#30 refunded)
Type of Fee Amendment
Date Check Rec'd. 9/3/85
Received By J. [illegible]

200.

27 1985

8/16/058

RESUME

Training and Experience

SCOTT C. MUNSON

Mr. Munson received a Bachelor of Science Degree in Civil Engineering from North Dakota State University in (b)(6) He has had extensive radiation safety training since that time.

His training consists of 280 hours in courses in Regulatory Practices and Procedures, Inspections, and Radiological Emergency Response Planning, conducted by the U.S. Nuclear Regulatory Commission at Silver Springs, Maryland, Glen Ellyn, Illinois, and the Nevada Test Site.

Additional training consists of more than 500 hours in Health Physics and Radiation Protection programs, Industrial Radiography, and Air Pollution Control at Oak Ridge Associated Universities, John Hopkins University, Louisiana State University, Colorado State University, and the University of Lowell.

Mr. Munson worked as an Environmental Engineer at the North Dakota State Health Department in their Radiation and Noise Programs from 1975 to 1977 and as Manager of the Programs from 1977 to 1979.

He was employed by Kerr-McGee Chemical Corporation as Health Physicist at the West Chicago Rare Earths Facility in West Chicago, Illinois in 1979 and became Manager of Quality Assurance at that facility in 1981.

Mr. Munson has been employed as Senior Staff Environmental Specialist in the Environment and Health Management Division, Department of Nuclear Licensing and Regulation, Kerr-McGee Corporation, Oklahoma City, Oklahoma, since 1983.

460758

SEP 19 1984

Kerr-McGee Corporation
ATTN: J. C. Stauter, Director
Nuclear Licensing and Regulation
123 Robert S. Kerr Avenue
Oklahoma City, Oklahoma 73125

Docket No. 040-08006
License No. SUB-986
Control No. 24052

Gentlemen:

This is to acknowledge receipt of your application for renewal of the source 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,

R. J. Everett, Chief
Nuclear Materials Safety Section

NMSS
JAMarshall;df
9/18/84

C:NMSS
RJEverett
9/18/84

KERR-McGEE CORPORATION
KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

ENVIRONMENT AND HEALTH MANAGEMENT DIVISION

August 29, 1984

EXPRESS MAIL
RETURN RECEIPT REQUESTED

Richard E. Cunningham, Director
Division of Fuel Cycle and Material Safety
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Mail Stop #396-SS
7915 Eastern Avenue
Silver Springs, Maryland 20912

Re: License SUB-986
Docket 40-8006

Dear Mr. Cunningham:

Enclosed are four copies of the renewal application for the referenced license with only minor changes from the previous license.

Check number 023338 in the amount of $230.00 is enclosed in accordance with 10 CFR 170.31(2G). If you require additional information, please let me know.

Sincerely,

J.C. Stauter

J.C. Stauter, Director
Nuclear Licensing & Regulation

JCS:ML/br

Enclosures: (2)

cc: W. Robertson, Kerr-McGee Technical Center
G. Sinke, Kerr-McGee Corporation
A. Dooley, Kerr-McGee Corporation

2405

NRC FORM 2
3-82
10 CFR 40

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR SOURCE MATERIAL LICENSE

APPROVED BY OMB
3150-0019
EXPIRES 12-31-83

Pursuant to the regulations in Title 10, Code of Federal Regulations, Chapter 1, Part 40, application is hereby made for a license to receive, possess, use, transfer, deliver or import into the United States, source material for the activity or activities described.

1. LICENSE INFORMATION *(Check one)*

- [ ] A. NEW LICENSE
- [ ] B. AMENDMENT TO LICENSE NO. _____
- [X] C. RENEWAL OF LICENSE NO. SUB-986
- [ ] D. PREVIOUS LICENSE NO. _____

2. NAME OF APPLICANT

Kerr-McGee Corporation

PRINCIPAL BUSINESS ADDRESS

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

3. STATE THE ADDRESS(ES) AT WHICH SOURCE MATERIAL WILL BE POSSESSED OR USED

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

4. NAME OF PERSON TO BE CONTACTED CONCERNING THIS APPLICATION

J.C. Stauter

TELEPHONE NUMBER *(Of person to be contacted)*

(405) 270-2623

5. DESCRIBE PURPOSE FOR WHICH SOURCE MATERIAL WILL BE USED

Thorium to be used in thorium purification and thorium removal process development studies. Uranium materials used to provide radiation sources of known composition for experimental work, design and calibration of new instruments and related investigations. Uranium, natural and depleted, is also used for process development studies.

6. STATE THE TYPE OR TYPES, CHEMICAL FORM OR FORMS, AND QUANTITIES OF SOURCE MATERIAL YOU PROPOSE TO RECEIVE, POSSESS, USE, OR TRANSFER UNDER THE LICENSE

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
URANIUM DEPLETED IN THE U-235 ISOTOPE	Metal, UF_4	Solids and Solution	25 kilograms
THORIUM *(Isotope)*	Natural Thorium ThO_2, $ThCl_4$, $Th(NO_3)_4$	Solids, Wet Cakes, and Solutions to 10% Th	150 kilograms

E. MAXIMUM TOTAL QUANTITY OF SOURCE MATERIAL YOU WILL HAVE ON HAND AT ANY TIME *(Kilograms)*

425 kilograms

7. DESCRIBE THE CHEMICAL, PHYSICAL, METALLURGICAL, OR NUCLEAR PROCESS OR PROCESSES IN WHICH THE SOURCE MATERIAL WILL BE USED, INDICATING THE MAXIMUM AMOUNT OF SOURCE MATERIAL INVOLVED IN EACH PROCESS AT ANY ONE TIME, AND PROVIDING A THOROUGH EVALUATION OF THE POTENTIAL RADIATION HAZARDS ASSOCIATED WITH EACH STEP OF THOSE PROCESSES.

SEE SUPPLEMENTAL SHEET FOR ITEM 7.

8. LIST THE NAMES AND ATTACH A RESUME OF THE TECHNICAL QUALIFICATIONS INCLUDING TRAINING AND EXPERIENCE OF APPLICANT'S SUPERVISORY PERSONNEL AND THE PERSON RESPONSIBLE FOR THE RADIATION SAFETY PROGRAM *(or of applicant if an individual).*

SEE SUPPLEMENTAL SHEET FOR ITEM 8.

9. DESCRIBE THE EQUIPMENT AND FACILITIES WHICH WILL BE USED TO PROTECT HEALTH AND MINIMIZE DANGER TO LIFE OR PROPERTY AND RELATE THE USE OF THE EQUIPMENT AND FACILITIES TO THE OPERATIONS LISTED IN ITEM 9; INCLUDE:
A. RADIATION DETECTION *(including film badges, dosimeters, counters, air sampling, and other survey equipment as appropriate, the description of radiation detection instruments should include the instrument characteristics such as type of radiation detected, window thickness, and the range(s) of each instrument).*

SEE SUPPLEMENTAL SHEET FOR ITEM 9.

B. METHOD, FREQUENCY AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED IN A. ABOVE, INCLUDING AIR SAMPLING EQUIPMENT *(for film badges, specify method of calibrating and processing, or name supplier).*

SEE SUPPLEMENTAL SHEET FOR ITEM 9.

24052

9C. VENTILATION EQUIPMENT WHICH WILL BE USED IN OPERATIONS WHICH PRODUCE DUST, FUMES, MISTS, OR GASES, INCLUDING PLAN VIEW SHOWING TYPE AND LOCATION OF HOOD AND FILTERS. MINIMUM VELOCITIES MAINTAINED AT HOOD OPENINGS AND PROCEDURES FOR TESTING SUCH EQUIPMENT.

SEE SUPPLEMENTAL SHEET FOR ITEM 9.

10. DESCRIBE PROPOSED PROCEDURES TO PROTECT HEALTH AND MINIMIZE DANGER TO LIFE AND PROPERTY AND RELATE THESE PROCEDURES TO THE OPERATIONS LISTED IN ITEM 7; INCLUDE:
A. SAFETY FEATURES AND PROCEDURES TO AVOID NONNUCLEAR ACCIDENTS, SUCH AS FIRE, EXPLOSIONS, ETC., IN SOURCE MATERIAL STORAGE AND PROCESSING AREAS.

SEE SUPPLEMENTAL SHEET FOR ITEM 10.

B. EMERGENCY PROCEDURES IN THE EVENT OF ACCIDENTS WHICH MIGHT INVOLVE SOURCE MATERIAL.

SEE SUPPLEMENTAL SHEET FOR ITEM 10.

C. DETAILED DESCRIPTION OF RADIATION SURVEY PROGRAM AND PROCEDURES.

SEE SUPPLEMENTAL SHEET FOR ITEM 10.

11. WASTE PRODUCTS

A. QUANTITY AND TYPE OF RADIOACTIVE WASTE THAT WILL BE GENERATED

☐ NONE WILL BE GENERATED

☒ SEE ATTACHED SUPPLEMENTAL SHEET SEE SUPPLEMENTAL SHEET FOR ITEM 11.

B. DETAILED PROCEDURES FOR WASTE DISPOSAL

12. IF PRODUCTS FOR DISTRIBUTION TO GENERAL LICENSEES OR TO THE GENERAL PUBLIC UNDER AN EXEMPTION CONTAINED IN 10 CFR 40 ARE TO BE MANUFACTURED, USE A SUPPLEMENTAL SHEET TO FURNISH A DETAILED DESCRIPTION OF THE PRODUCT, INCLUDING:

A. PERCENT SOURCE MATERIAL IN THE PRODUCT AND ITS LOCATION IN THE PRODUCT.

B. PHYSICAL DESCRIPTION OF THE PRODUCT INCLUDING CHARACTERISTICS, IF ANY, THAT WILL PREVENT INHALATION OR INGESTION OF SOURCE MATERIAL THAT MIGHT BE SEPARATED FROM THE PRODUCT.

C. BETA AND BETA PLUS GAMMA RADIATION LEVELS *(Specify instrument used, date of calibration and calibration techniques used)* AT THE SURFACE OF THE PRODUCT AND AT 12 INCHES.

D. METHOD OF ASSURING THAT SOURCE MATERIAL CANNOT BE DISASSOCIATED FROM THE MANUFACTURED PRODUCT.

SEE SUPPLEMENTAL SHEET FOR ITEM 12.

13. CERTIFICATE
(This must be completed by the applicant)

The applicant and any official executing this certificate on behalf of the applicant named in item 2, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 40, and that all information contained herein, including any supplements attached hereto, is true to the best of our knowledge and belief.

J.C. Stauter	J.C. Stauter	8/27/84
APPLICANT'S SIGNATURE	PRINTED OR TYPED NAME	DATE

Director, Nuclear Licensing and Regulation, Kerr-McGee Corporation

TITLE OF CERTIFYING OFFICIAL AUTHORIZED TO ACT ON BEHALF OF THE APPLICANT

WARNING: 18 U.S.C. Section 1001; Act of June 25, 1948; 62 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.

Application for Renewal of License SUB-986
by the
Kerr-McGee Corporation, Oklahoma City, Oklahoma

Supplemental Sheets

Item 7

Thorium in impure solutions is to be extracted by organic solvents, stripped with water and precipitated as a wet cake. Optimum solvent extraction procedure parameters will be determined. The maximum batch will not exceed 15 kilograms. Materials will be received as pure thorium compounds or wet cakes, and actual work will be done using solutions. Laboratory hoods (face velocity 70-80 fpm) are used for solution preparation. Solutions and wet thorium cakes will be stored in corrosion-resistant containers. The storage containers will be covered and well marked with approved warning signs or labels.

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 pit area is appropriately marked with a radiation warning sign. Some uranium ore process development studies are also periodically performed.

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.

While no development work on thorium purification has been carried on since 1973, work on thorium removal from various feed and process materials is currently in progress. These materials and concentrates often contain thorium in amounts sufficient to be classified as source material. The uranium instrument test pits are seldom used more than ten days a year. The corporation is currently investigating the possibility of becoming a supplier of depleted UF_4. This location could become involved in examination and testing of various samples.

Item 7 (continued)

Access to radioactive materials is restricted to personnel who are trained to handle them safely. The limited use of small quantities of non-dry thorium compounds and the confined uranium materials pose no significant hazard to the workers or the general public.

Kerr-McGee Corporation
Oklahoma City, Oklahoma

Item 8 Supervisory Personnel and the Radiation Protection Officer

Wilbert J. Robertson, Jr. - Laboratory Radiation Protection Officer

Education

Bachelor of Science degree in Chemistry. Doctorate in Inorganic Chemistry. Mr. 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.

Garet E. Van De Steeg

Education

Graduate student at the University of New Mexico, Albuquerque, beginning in (b)(6) and concluding with receipt of a doctorate in Chemistry in (b)(6)

Training while at the University of New Mexico included:

a. Nine semester hours of formal courses in principles and practices of radiochemistry and nuclear chemistry.

b. Twelve semester hours of formal courses in animal and human physiology and radiation biology.

c. Three semester hours of formal courses in radiogeochemistry.

d. Approximately 500 hours of seminars in radiochemistry and nuclear chemistry.

e. In excess of 10,000 hours (5 years) of laboratory research using radioactive isotopes under Atomic Energy Commission contract.

Experience

Experience with radiation, while at the University of New Mexico, includes 5 years continuous laboratory research with Iodine-131, in amounts up to 20 millicuries while studying the dilute solution chemistry of iodine and carrier-free behavior of Iodine-131 (See Progress Reports 6 through 9, 1964 and 1968, AEC Contract AT(11-1)-733).

Item 8 (continued)

Other radiation experience while at the University involves short term (about one week) use of microcurie amounts of Phosphorous-32, Sulfur-35, Chlorine-36 and Iodine-131 while studying tracer techniques in-vivo on laboratory animals.

Robert E. Leonard

Education

Bachelor of Science degree in Chemistry. Basic Radiation Health Training by the U.S. Department of Health, Education and Welfare (b)(6)

Experience

Employed 1951 through 1957 at the Oak Ridge K 25 diffusion plant performing experimental work on enriched UF_6. Responsible for licensing and radiation health program involving S 35 while employed at the American Potash and Chemical Corporation, Henderson, Nevada plant. Radiation Safety Officer in charge of six density gauges at the American Potash, Hamilton, Mississippi plant.

Gerald J. Sinke - Corporate Radiation Safety Officer

Education

Bachlor of Science degree in Chemistry. Postgraduate Health Physics training through the U.S. Department of Health, Education and Welfare.

Experience

Thorium and rare earth chemist; Health Physicist and Radiation Safety Officer for the thorium operations of the American Potash and Chemical Corporation (now a part of Kerr-McGee Corporation). Mr. Sinke served as Manager, Health Physics and Industrial Safety, at the Kerr-McGee Uranium and Plutonium Fuels Fabrication Plants (Cimarron Facility) for three years. He now functions as Staff Health Physicist for the Kerr-McGee Corporation. Mr. Sinke is a Certified Safety Professional and has over 22 years experience in the field of Health Physics.

Kerr-McGee Corporation
Oklahoma City, Oklahoma

Item 9

Item 7 described the rural farmland type location of the Kerr-McGee Technical Center. Figure 1 is a floor plan of the laboratory buildings. Laboratory rooms C5 and E12 are used for chemical work involving the use of radiotracers; lab F4 is equipped for isotope storage and for low level radiochemical work. The use of radioisotopes is authorized under our Byproduct License 35-12636-06.

The area C13-E10 has previously been used for thorium work. Room D-3 and Room F-2 currently house 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.

Survey and monitoring instruments include an Eberline E-120 beta-gamma instrument (0-50 mr/hr, 30 mg/cm^2 window), and an Eberline PAC-3G alpha survey meter. These instruments are tested for proper function with a check source prior to use and are calibrated semi-annually and after repairs. The calibration is contracted out to the Eberline Instrument Company, P.O. Box 2108, Santa Fe, New Mexico 87501, who perform this service under License NM-EBE-BL-00.

Measuring instruments are also in use. These are:

a. Canberra 8100 M.C.A. (0.001 dpm alpha).

b. NMC PC-4 (0.2 dpm alpha).

c. Canberra Ge (Li) MAC 3000 (<1 dpm gamma).

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.

Kerr-McGee Corporation
Oklahoma City, Oklahoma

Item 10

A. Thorium

The severity of a possible accident during the thorium solvent extraction experiments is minimized by the limited scale of operations. The quantity of flammable solvents in use at any one time will be resticted to as small an amount as practicable. The laboratory building and storage areas are rated as fireproof construction. Fire extinguishers and personnel trained to use them are amply provided.

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 physicists and health technicians (and their equipment) from Kerr-McGee Corporation's nuclear facilities 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.

When thorium is processed during the solvent extraction (SX) investigations, the following survey program is used:

(1) Air sampling is conducted when preparing the solutions by dissolving dry thorium salts. Air sampling is also conducted periodically during the SX processing. Time weighted exposure calculations, if necessary, will be made in accordance with the regulations found in 10 CFR 20.103. Appropriate cause evaluations and corrective actions will also be conducted in accordance with these rules.

(2) Surface contamination evaluations are conducted for both the restricted (operating) areas and the unrestricted areas. When the thorium SX experiments are concluded, the operating area is cleaned to unrestricted level limits. The maximum alpha readings for unrestricted use of facilities and equipment are 3000 dpm/100 cm^2, and the average is 1000 dpm/100 cm^2. (For natural uranium, the levels are a factor of 5 higher.)

Item 10 (continued)

During the thorium operations, an alpha survey meter is provided for personnel survey of their protective clothing, hands and shoes prior to exiting the operating area. If needed, personnel decontamination is performed to prevent the spread of contamination to unrestricted areas.

(3) An evaluation of gamma dose rates will be made at the beginning of operations. Personnel will wear film or T.L.D. dosimeters. Postings appropriate to the radiation level will be made using radiation warning signs. Dose rate monitoring of the processing area and storage area(s) will be conducted no less than bi-monthly.

(4) There will be no effluent discharges except for wastes which are discussed in Item 11.

(5) 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 a large accidental exposure, bioassay and medical management programs may be instituted.

(6) Other elements of the survey program include receiving inspection monitoring of packages containing radioactive material, keeping health physics records and inventories, labeling, posting procedure development and training.

(7) The personnel responsible for conduct of the radiation survey program are listed in Item 8. Specifically their primary responsibilities are:

W.J. Robertson is the Laboratory Radiation Protection Officer (LRPO). He trains personnel and causes the routine surveys to be conducted by a monitor technician. He makes special surveys, keeps health physics records, reviews and approves work activity involving radioactive materials and recommends safe work procedures, protective equipment and control methods. He directs radiological emergency activities and evaluates the hazard resulting from accidental releases of radioactive materials.

Garet Van De Steeg (radiochemist) supervises the necessary analysis on air samples, soil samples, vegetation, waste materials, bioassay samples and experimental process control samples.

Responsible supervisors direct the processing aspects of thorium SX activities and the use of the uranium test pit facilities.

G.J. Sinke is the Corporate Radiation Protection Officer. He furnishes an overview function regarding health physics aspects of the company's radiation safety program. He performs an annual audit of the Technical Center. His findings and recommendations are reported to top management personnel. He assists and councils the LRPO on matters concerning radiological safety.

Item 10 (continued)

B. Uranium

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 at annually. The values of low dose rates above and near the test pits are known.

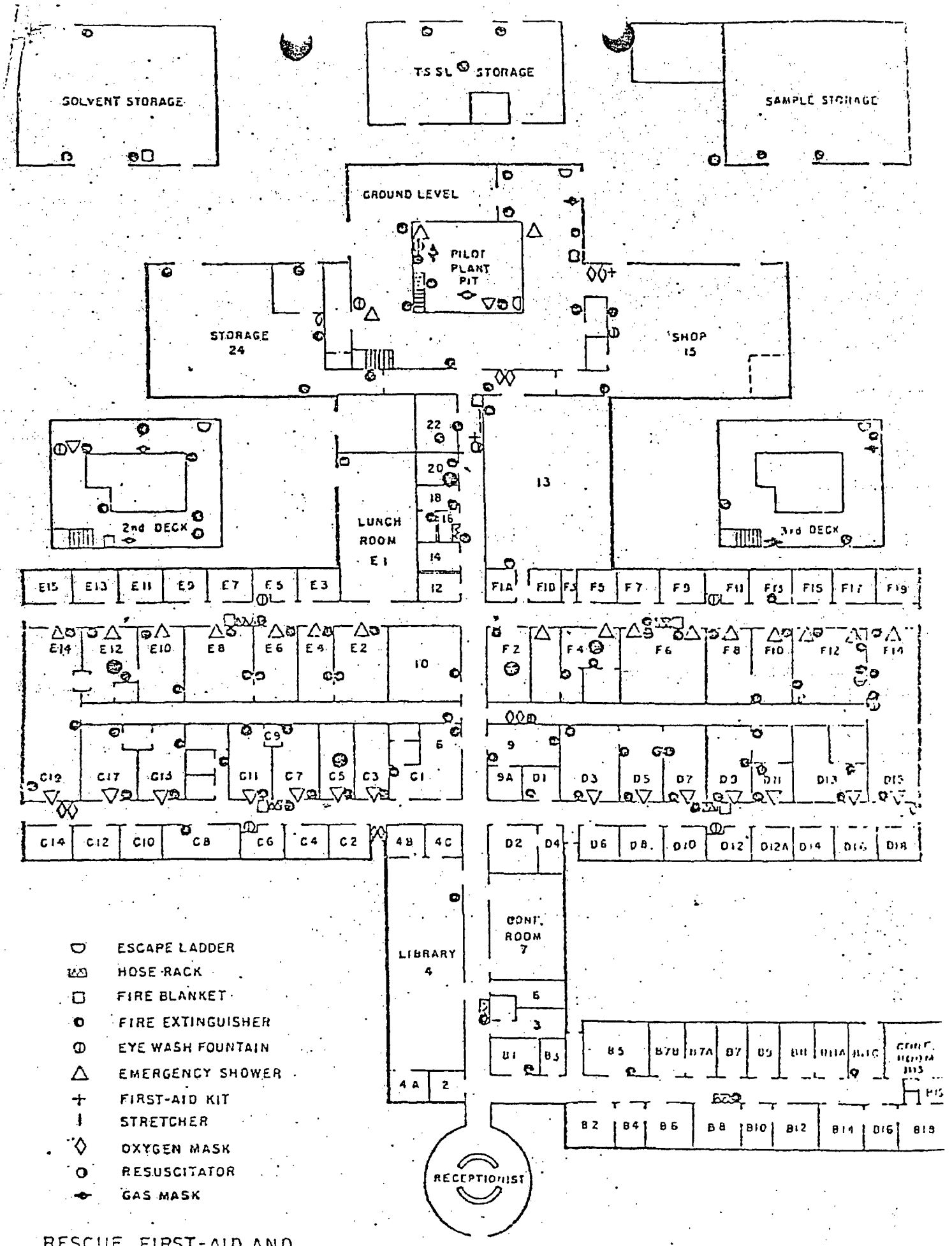
The handling of more than sample amounts of uranium at one time is unusual. Should the need for handling larger quantities of uranium occur (such as blending new mixtures fot the test pits), then appropriate health physics procedures will be followed similar to those outlined above for thorium source material.

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.

Item 12

Not applicable.



RESCUE, FIRST-AID AND FIRE FIGHTING EQUIPMENT

C: # 1

KERR-McGEE TECHNICAL CENTER