OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Leo Dubinski, Assistant Director for Materials, Division of Compliance, Hq.

DATE: July 27, 1964

FROM : Donald I. Walker, Director
Region IV, Division of Compliance, Denver

SUBJECT: KERR-McGEE OIL INDUSTRIES, INC., 5950 McINTYRE ROAD, GOLDEN, COLORADO - LICENSE NO. SUB-143 (DOCKET NO. 40-6175)

The licensee's pilot plant at Golden, Colorado, was visited by Philip S. Sandel on July 13, 15, and 24, 1964. The purpose of the visits was to conduct a close-out inspection of the subject licensee's facilities as was requested by Jack R. Roeder, CO:HQ, in his memo route slip of June 25, 1964.

The following persons were contacted during the course of the visits: Mr. Wayne R. Hazen, Hazen Research, Inc., and Mr. Dale Thomas, Hazen Research, Inc. Both Mr. Hazen and Mr. Thomas were formerly employed by Kerr-McGee Oil Industries at the pilot plant at Golden, and were representing Kerr-McGee Oil Industries during the close-out inspection.

The general layout of the Kerr-McGee Oil Industries pilot plant is as described in the licensee letter to Mr. Donald A. Nussbaumer of June 3, 1964. Mr. Hazen pointed out the rooms in the main laboratory building which had been used for uranium ore processing and handling and indicated to the inspector the portions of the tailings pond which had been utilized for uranium ore tailings.

Hazen stated that all usable equipment had been moved by Kerr-McGee Oil Industries to their uranium mill near Grants, New Mexico, and that all source material from the pilot plant had also been taken to the Grants mill.

By letter of June 3, 1964, Mr. V. L. Mattson, Vice President, Kerr-McGee Oil Industries, informed DLR of the results of the survey of the facilities at Golden. The survey included analysis of the soil in the tailings pile area as well as a comprehensive survey of the pilot plant and other buildings. The letter further stated that the survey of the

buildings was conducted by B. N. Logan, Chief Chemist for Kermac Nuclear Corporation at Ambrosia Lake, New Mexico. A review of this letter indicated that Logan had utilized a Nuclear-Chicago alpha counter Model 2112, equipped with an AP4 counting head for alpha contamination surveys. Removable alpha was determined by taking smears for assay. Beta-gamma radiation was detected using an Eberline Model E-112B Geiger counter equipped with an HP-180 probe. Results of Logan's survey indicated the maximum removable alpha contamination to be 243 d/m/100 cm^2, maximum fixed alpha contamination to be 800 d/m/100 cm^2, and the maximum beta-gamma radiation level to be 0.3 mrad/hr. Results of Logan's survey indicated that all areas were below the applicable AEC limits.

Hazen stated that he had hired a bulldozer to cover and level the tailings pile during the month of June. It was observed that the tailings pile dam had been leveled and the area graded.

Hazen outlined the tailings area that had been used for uranium tailings and the inspector took fifteen soil samples in this area. These were composited into one sample and forwarded to the Idaho Health & Safety laboratory for analysis.

The AEC inspector conducted an independent survey of the facility on July 13, 1964. The following instruments were utilized by the inspector to conduct the survey of the facility:

1. Nuclear-Chicago Model 2612 GM survey meter which was calibrated by the Dow Chemical Company, Rocky Flats Division, on June 6, 1964. This instrument has a detector tube which has a tissue-equivalent thickness of 30 milligrams/centimeter ^{2}. (This instrument was used on July 13 and 15, 1964.)

2. An Eberline Instrument Company portable air proportional alpha counter, Model PAC-1A. This instrument was calibrated by the Dow Chemical Company, Rocky Flats Division, on June 6, 1964. This instrument has an active detective area of approximately 55 centimeters ^{2} and an efficiency of approximately 50%.

3. Frieseke Hoepfner Model FH-40-T which was calibrated by the Dow Chemical Company, Rocky Flats Division, on July 14, 1964. This instrument was outfitted with an end-window GM detector

tube with a tissue equivalent thickness of 2.9 milligrams/ centimeter ^{2}. This instrument was used on July 24, 1964, for final survey.

Forty smears were taken at random from the floors and walls of the buildings of the Kerr-McGee Oil Industries' facilities. The facility was then thoroughly surveyed with portable alpha and beta-gamma detection instruments. Whatman No. 41 filter paper was utilized for the smear survey and an area of approximately 100 square centimeters was smeared with each filter; smears were analyzed by the Health Physics Section, Dow Chemical Company, Rocky Flats Division. Compilation of the results of the survey follows:

1. The maximum reading obtained with the portable alpha survey instrument on July 13, 1964, was 20,000 counts/minute. (This reading is equivalent to 72,000 d/m/100 cm ^{2}.) This reading was noted near a trench in a lean-to facility adjacent to the pilot plant building. Other readings up to 10,000 counts/minute (equivalent to 36,000 d/m/100 cm ^{2}) were found in the lean-to facility. In all other buildings, the maximum alpha reading obtained was in a sink in the pilot plant building which indicated 3,000 c/m (equivalent to 10,000 d/m/100 cm ^{2}). All other readings found were equivalent to or less than those reported by the licensee.

2. Readings obtained with a portable beta-gamma survey instrument were as follows: the maximum obtained was in the lean-to adjacent to the pilot plant and here one area was found which read 8 mrad/hr. The average reading obtained one centimeter from the floor of the lean-to building was 1 mrad/hr. All other readings were less than 0.1 mrad/hr with the exception of the small portion of the tailings pile which had been used for uranium tailings. The average reading in this area was 0.3 mrad/hr with a maximum of 0.5 mrad/hr.

3. The maximum removable alpha contamination noted on the smears taken was 153 d/m/100 cm ^{2} on a smear taken from the floor of the lean-to building adjacent to the pilot plant. The next highest smear was 120 d/m/100 cm ^{2} also found in the lean-to building.

4. The maximum amount of removable beta plus gamma contamination was 79 d/m/100 cm ^{2} found in the lean-to adjacent to the pilot plant building.

The results reported in the previous paragraphs were those found by the AEC inspector on the initial survey conducted July 13, 1964. See Appendix A for a diagram of the lean-to facility survey of July 13, 1964. At the conclusion of this survey, Mr. Hazen stated that it appeared that the small lean-to adjacent to the pilot plant building had been overlooked by the licensee in his original survey and report to the Commission. Hazen stated that he would contact Kerr-McGee management in Oklahoma City and discuss possible action.

On July 15, 1964, Mr. Hazen contacted the inspector at the Region IV, Division of Compliance office, and stated that the lean-to facility had been vacuumed and washed, but not surveyed, and requested an additional survey of the facility. This survey was conducted on July 15, 1964, utilizing instrumentation previously described and the results are as follows:

1. Maximum fixed alpha contamination detected in the lean-to facility was 36,000 d/m/100 cm^2 in one corner of the facility. The average fixed alpha contamination detected on the floor of the facility was 10,000 d/m/100 cm^2. (See Appendix B for a diagram of the survey of July 15, 1964.)

2. The maximum beta plus gamma fixed contamination detected was 4 mrad/hr in the trench in the floor of the lean-to facility. The average beta plus gamma fixed contamination level one centimeter from the floor of the lean-to facility was 0.6 mrad/hr.

3. Removable alpha and beta contamination was less than 150 d/m/100 cm^2 in all cases on ten smears taken from the floor.

Mr. Hazen was informed of the results of the survey and, in addition, Mr. V. L. Mattson, Vice President of Kerr-McGee Oil Industries, was contacted on the afternoon of July 15, 1964, by telephone. Mattson stated that he felt that the room had been somehow overlooked in the original Kerr-McGee survey and that arrangements for decontamination of the facility would be made by Mr. Hazen and that Mr. Hazen would contact Region IV, Division of Compliance, upon completion of the decontamination of the facility.

Mr. Hazen contacted the inspector on July 23, 1964, to report that the facility had been decontaminated.

On July 24, 1964, the inspector conducted a third survey of the facility using the portable survey instruments previously described. A 3- to 4-inch concrete covering has been poured over the floor of the small building. The trench had been completely filled and covered.

Survey results indicated no alpha (fixed or removable) contamination and beta-gamma results at one centimeter from the floor were in all cases < 0.1 mrad/hr. (See Appendix C for results.)

Results of the soil samples will be forwarded when received from the Idaho Health & Safety laboratory.

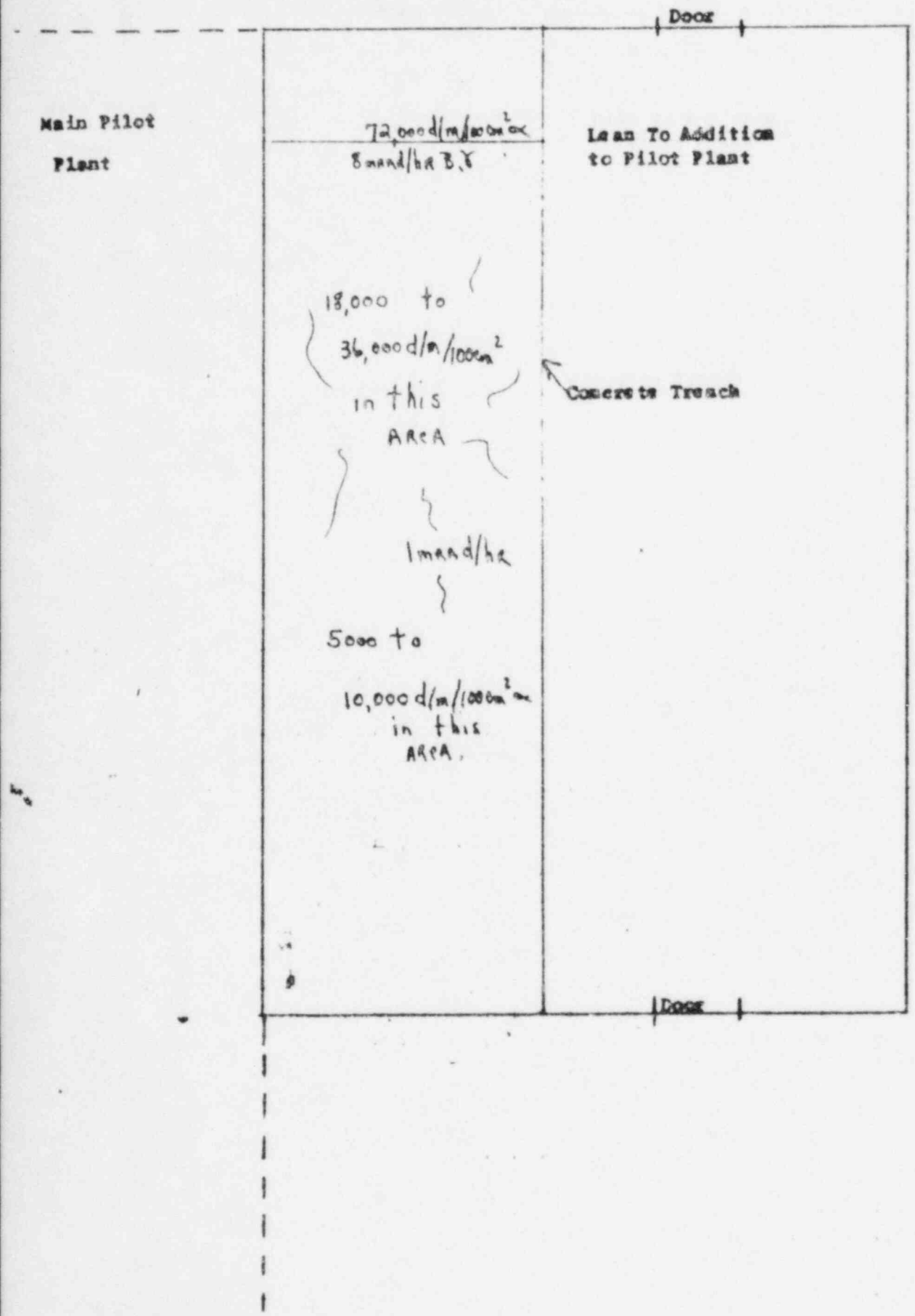
KERR-McGEE OIL INDUSTRIES

PILOT PLANT GOLDEN, COLORADO

Not to Scale

Survey of

July 13, 1964

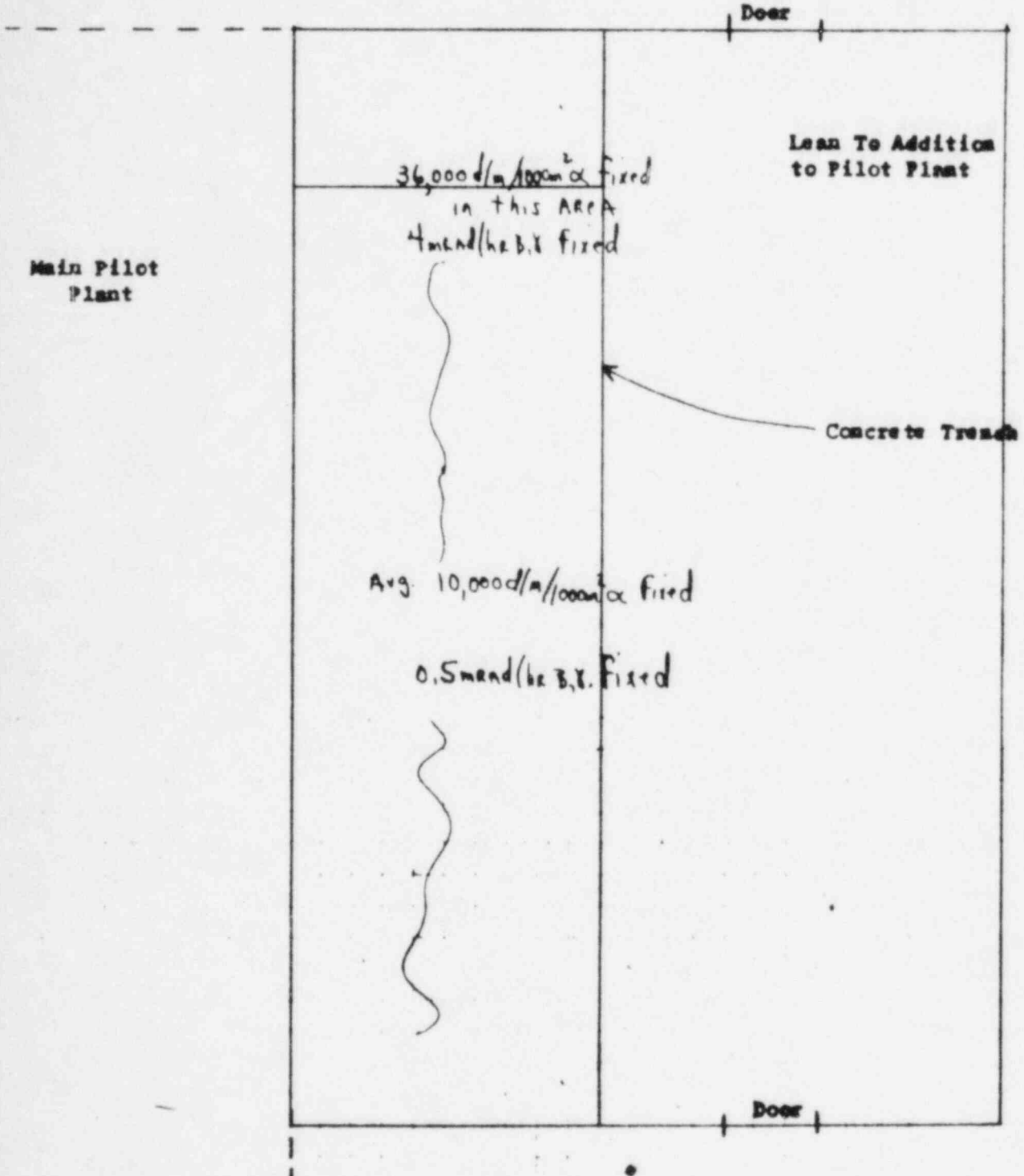


B APPENDIX "B"

Kerr-McGee Oil Industries

Not to Scale

Pilot Plant Golden, Colorado



Appendix "C"

Kerr-McGee Oil Industries

Pilot Plant Golden, Colorado

Not to Scale

Survey of

July 24, 1964