



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

August 9, 1977

MEMORANDUM FOR: Region III Files

THRU: G. T. Lonergan, Chief, Materials Radiological
Protection Section No. 1

FROM: C. T. Oberg, Radiation Specialist

SUBJECT: KERR-MC GEE CHEMICAL CORPORATION, WEST CHICAGO, ILLINOIS
LICENSE NO. STA-583
BRIEF TOUR OF FACILITY BY REGION III INSPECTOR

On August 5, 1977, an NRC Region III inspector made a brief tour of the subject licensee's West Chicago, Illinois Rare Earth Plant in a continuing effort to maintain cognizance of the status of the facility and the work in progress.

The Action Items (AI) No. 1 through 4, as agreed to by the licensee in their letter dated November 30, 1976, appear to remain satisfied. Work on AI No. 5 is in progress.

ATCOR personnel under contract to the subject licensee, continue to package waste source material from a storage shed in the waste area, in preparation for shipment to NECO, Sheffield, Illinois, for burial.

A total of 12 shipments have been made to date (8/5/77) consisting of a total of 108 sealed "tote" boxes, nine (9) boxes per shipment. ATCOR personnel are preparing three (3) 2500-3000 gallon tanks and two (2) 5000 gallon tanks as overpacks for the waste source material consisting mostly of gas mantle material (thorium nitrate). These tanks are also to be shipped to NECO for burial. ATCOR personnel have procured many new 55 gallon drums with gasketed lids and bolted ring seals for the disposition and shipment of thorium ores and concentrates piled in the shed. When filled, these drums will also go to NECO for burial.

Except for shipment No. 7, the RIII inspector has received copies of shipping records and survey data through shipment No. 11 on August 4, 1977. A copy of shipment No. 8 will be made and furnished to RIII.

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ATCOR personnel are taking daily air particulate samples in the shed during working operations. These samples are counted daily in an alpha counter until the activity level is $1 \text{ E-12 } \mu\text{Ci/cc}$ or until repetitive daily counting indicates no significant change. Sampling and counting has been performed each working day since July 28, 1977. The following is a tabulation of samples taken since the day of the fire on *July 26, 1977, (reference report of August 3, 1977).

AIR PARTICULATE SAMPLES TAKEN BY ATCOR PERSONNEL

<u>Date</u>	<u>Time</u>	<u>Location</u>	<u>$\mu\text{Ci } \alpha/\text{cc at To}$</u>
*7/26/77	3:15 p.m.	Smoke from smoldering fire.	9.2 E-9
7/28/77	9:20 a.m.	At gate to waste area.	1.5 E-9
7/28/77	11:30 a.m.	Inside of shed.	1.9 E-8
7/29/77	4:00 p.m.	Inside of shed.	8.8 E-9
7/30/77	3:00 p.m.	Inside of shed.	8.8 E-10
8/ 1/77	3:00 p.m.	Inside of shed.	7.1 E-9
8/ 2/77	5:30 p.m.	Inside of shed.	3.4 E-9
8/ 3/77	3:15 p.m.	Inside of shed.	1.7 E-9
8/ 4/77	3:30 p.m.	Inside of shed.	3.8 E-9

These samples appear to be decaying with approximately a 10 hour period which is characteristic of thorium 232 daughter products subsequent to the emanation of gaseous radon 220 (emanation thoron) and the dominant 10.64 hour half-life of lead 212 (thorium B) in the remainder of the series.

Copies of the ATCOR incident report dated August 2, 1977, on the fire which took place at the subject licensee's waste site on July 26, 1977, have been received at RIII. Results of air sample analyses presented in the incident report are different from those originally obtained by the RIII inspector on July 28, 1977. The reason for the differences as stated by ATCOR personnel, were; that the conversion factor for counting the air sampling was incorrectly used; that some of the counting data was mislaid and could not be located, and that the sample itself has been lost so that no further data could be obtained. ATCOR's records show that the sample was counted only three times before being misplaced and/or lost. The air sample counting data available gives evidence of

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approximately a 10 hour half-life as opposed to the apparent half-life of about 15 minutes originally estimated from data obtained by the RIII inspector on July 28, 1977

ATCOR personnel will continue to package and prepare waste thorium source material for shipment from the KERR-MC GEE, West Chicago, Illinois facility to Sheffield, Illinois for burial by NECO. At present, ATCOR estimates that this work will take approximately another six (6) weeks for completion.

During this inspection tour, the RIII inspector also toured the plant facilities and discussed various items with the KERR-MC GEE (K-M) site representatives. The inspector was informed that KUHN and AUER (K&A) personnel are still in and out of the facility, that they were removing some additional material which has possibly been sold (three tanks and a gas classifier) and that the electrical switchgear is still on site awaiting pickup by the purchaser. The contractual arrangements between K-M and K&A companies are apparently being reviewed to resolve the legal aspect of conditional sale agreement and the financial status including the escrow conditions. As of July 1, 1977, K-M has assumed the financial responsibility for the utilities supplied to the plant and contractual arrangements for the security guard and patrol. These items had been the responsibility of K&A co. up to that date.

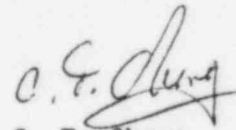
K-M is still holding source material product which has been sold. This material is to be repackaged by depositing the cardboard containers into steel drums prior to release to the purchaser. K-M has ordered the drums for this purpose and subsequent to repackaging plans to transfer the source material in three shipments of about 5000 pounds or less, each.

The RIII inspector discussed the incident of thorium bearing material transfer to MARVIN MOORE CHEMICAL COMPANY, Blue Island, Illinois (near Peotone, Illinois) in an attempt to obtain additional information about the transfer and possibility of other similar situations. The inspector was informed that this material had been packaged in drums about 1950 and had been stored in the East shed (along the road beside the waste area). The material, (about 200 drums) identified and supposedly labeled as neocarbonate, was sold and removed during 1974. Site personnel stated that the thorium material must have been put into the drums in error. They also stated that they will remove the material from the MOORE CHEMICAL COMPANY location and return it to the KERR-MC GEE, West Chicago, Illinois, site. Further questioning revealed that other shipments had been made to a company in France. The material shipped was yttrium/gallium chloride and samarium/gallium chloride concentrate solutions.

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The thorium content of these had been assayed and evaluated to be less than 0.05% as required by 10 CFR 40. Personnel could not recall other material shipments which may have included thorium bearing material. In retrospect, the KERR-MC GEE site personnel stated that they believed that the fill material transported to Reed-Keppler Park was to have been sodium fluoride from the production of hydrofluoric acid at the plant. Again, the thorium bearing material must have been delivered by some inadvertent error instead of the sodium fluoride.

Brief inspection tours of the subject licensee's facility will continue as necessary to remain cognizant of the status of the facility and the progress of the work being performed.



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cc: J. M. Allan