

UNITED STATES GOVERNMENT

Memorandum

TO : Files
THRU: Donald A. Nussbarger, Chief
Source & Special Nuclear Materials Branch, DML
DATE: MAY 15 1967

FROM : Don F. Harmon
Source & Special Nuclear Materials Branch, DML

SUBJECT: RADIATION SAFETY REVIEW, ATLAS CORPORATION'S URANIUM MILLING ACTIVITIES,
DOCKET 40-3453

DML:DFH

Conclusions and Recommendations

Based on the information submitted by the licensee in support of his application and the present status of the licensee's compliance with the Commission's regulation 10 CFR 20, as determined during the last routine inspection on November 9 and 10, 1966, it appears that the licensee has adequate personnel, facilities, equipment, and operating procedures to continue his present milling operations in accordance with the Commission's rules and regulations except for the release of effluents as discussed below. Accordingly, it is recommended that the license be renewed.

Analysis and Findings

Location of Mill and Description of Area:

The subject mill is located approximately two miles northwest of Moab, Utah, which has a population of approximately 6000. The mill and tailings are situated between and adjacent to Highway 160 and the Colorado River. There are no residences within 1/2 mile from the site. With the exception of Moab, the area is arid (annual rainfall of about 10 inches) and sparsely populated. Mining and milling constitute the major commercial activities in the area.

Mill Process:

A carbonate leach resin-in-pulp extraction process is employed by the subject licensee for uranium extraction. In brief, the process consists of crushing, sampling and grinding ore having an average U_3O_8 content of 0.35 percent. Following grinding, the uranium is leached from the ore in autoclaves at elevated temperatures with a carbonate solution. The sands, after a sands-slimes separation, are then washed and discharged to the tailings pile. The slimes-pregnant solution mixture is then fed through the RIP circuit whereby the uranium is extracted on strong base



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anion exchange resins. The uranium is then stripped from the resin, precipitated, washed, dried and packaged for shipment in 55 gallon drums. Since a portion of the ores received at the subject mill contain economic copper concentrations, the licensee also operates a copper-uranium circuit. Steps involved in the process are crushing, grinding, flotation, acid leaching of the flotation concentrate, carbonate leaching of the flotation tails, filtration, solvent extraction, and copper cementation. The present production rate at the subject mill is approximately 1000 tons per day.

Ventilation Equipment:

In the description of the mill process and associated information, the licensee indicated that the operations likely to produce significant concentrations of airborne radioactivity are ore crushing, sampling and bucking (ore and final product sample preparation) and product drying and packaging. The operations from grinding through precipitation are wet processes and are not likely to produce significant quantities of airborne radioactivity particularly if good housekeeping procedures are employed. Specific details of all of the ventilation and air cleaning equipment utilized in the plant were provided in the renewal application, including criteria relative to authorized modifications in the process and/or ventilation equipment. Also, a quarterly airborne survey report was provided so as to indicate the effectiveness of the equipment. This report, coupled with the information obtained during the last routine inspection by CO of the plant indicates that exposures of employees to airborne radioactivity within the plant are within 10 CFR 20 limits. Accordingly, it appears that the licensee has provided adequate ventilation so as to adequately control airborne radioactivity exposures of employees.

Inplant Survey Program:

Airborne: In order to evaluate employee exposures to airborne radioactivity the licensee collects a minimum of 36 routine general and breathing zone air samples per quarter. Routine breathing zone samples (which are collected with a lapel, battery operated, sampler) are taken to evaluate each job classification where significant exposure levels are known to exist. Non-routine breathing zone surveys are also performed to evaluate the exposure of personnel working on jobs where a non-routine, high level of airborne radioactivity may be present. In addition to the quarterly breathing zone surveys, a quarterly general air survey is performed primarily to provide additional information on the status of airborne concentrations in the plant. In the event of process changes, breathing zone and general air surveys are conducted to evaluate and establish airborne radioactivity concentrations. In view of past results obtained at the subject facility, the above airborne survey program appears adequate.

External: All job classifications in the subject plant have been extensively monitored in the past by film badges to determine employee exposures. Personnel likely to be exposed in excess of 25% of the applicable limit in 10 CFR 20 are continuously badged. Changes in processes and/or job classifications require reassessment of employee exposures by film badge. Otherwise, changes in external radiation levels are determined by survey instrument at a minimum of 43 locations per quarter throughout the plant for comparison with past radiation levels. This program appears adequate, particularly in view of past experience which indicates low external radiation levels within the plant.

Environmental Airborne Survey Program:

The licensee's environmental survey program, as specified in his renewal application, consists of periodic tests of the stack gases from the product dryer plus a quarterly general air survey consisting of a minimum of 12 samples collected in and around Moab, with particular emphasis on populated areas. This program appears satisfactory.

Waste Retention and Environmental (Water) Survey Program:

See memoranda to files dated November 11, 1962, February 20, 1964, April 30, 1965, and September 12, 1966, for a discussion of the licensee tailings retention system, including effluent release and environmental survey programs.

Management, Organization and Qualifications of Personnel:

The licensee has provided a description of his organizational structure indicating responsibility and authority of management at his Moab mill. Additionally, personnel qualifications have been provided for those individuals in charge of the Company's radiation safety program. The licensee appears adequately qualified to conduct the proposed activities in accordance with Commission regulations.

Radiation Safety Instructions:

According to the licensee, all new mill employees are indoctrinated in general health precautions, what radiation is, why the standards or level of exposure were set and by whom, and where the potential hazards of radiation exist. Data for this educational program is taken from the booklet, Living With Radiation, Fundamentals, 1, published by the AEC. Copies are available to the employees upon request. These instructions and procedures appear adequate based on the activities of the licensee.

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Plant Security:

The plant site is fenced. The tailings area is posted in accordance with Section 20.203(e)(2). Based on the topography of the area, these measures appear adequate for controlling access to restricted areas.

Sample Analysis:

Uranium, radium and thorium analyses are performed using ID developed procedures and appear satisfactory.

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DISTRIBUTION:

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