



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

JUN 20 1980

DOS

MEMORANDUM FOR: Ross A. Scarano, Chief
Uranium Recovery Licensing Branch

THRU: John J. Linehan, Section Leader *JJL*
Uranium Recovery Licensing Branch

FROM: Jeffrey L. Kotsch
Uranium Recovery Licensing Branch

SUBJECT: AMENDMENT NO. 6 TO LICENSE NO. SUA-551, PETROTOMICS
COMPANY, SHIRLEY BASIN, DOCKET NO. 40-6659

In response to a staff request concerning the upgrading of Petrotomics' existing operational radiological effluent and environmental monitoring program, presented in their Radiation Safety Program, revised March 10, 1976, the licensee submitted proposed revisions in a letter from S. Pfaff, Petrotomics Company, to R. Scarano, NRC, dated April 20, 1979. Specific comments on the existing program and proposed revisions were discussed in the formulation of a revised monitoring program, outlined in Attachment A. Also, in the April 20, 1979 letter, the licensee requested two minor revisions to its Radiation Safety Program. These revisions involved the following: (1) Replacement of the gamma survey instrument by an alpha survey instrument for employee self-monitoring at the main mill exit. (2) The expansion of the personal dosimeter program to include all mill employees, with dosimeters being changed monthly instead of every two weeks.

The proposed action is the amendment of Source Material License SUA-551 to upgrade the effluent and environmental monitoring program and to incorporate the two minor revisions into the licensee's Radiation Safety Program. The amendment includes the following conditions. Condition No. 25, which formerly involved only the tailings impoundment well monitoring program, is revised to incorporate the entire effluent and environmental monitoring program. A new Condition No. 27, which requires the semi-annual reporting of monitoring results per 10 CFR 40, Section 40.65. Another new Condition No. 28 incorporates the two revisions to the Radiation Safety Program.

The above actions will improve the licensee's Radiation Safety Program in two ways. First, the effluent and environmental monitoring program will come into line with the newly revised Regulatory Guide 4.14 and

this will provide more reliable and comprehensive data with which to determine 40 CFR 190 compliance, effective December 1, 1980. Second, revising the two parts of the in-plant portion of the Radiation Safety Program will provide for a better determination of exposure to mill employees since all workers will be badged. This is an improvement over the present system which assumes that people working in the same area receive the same exposure, which is not very accurate since personnel may temporarily work in areas where they are not routinely assigned. Furthermore, the decrease in the frequency of dosimeter changes, from once every two weeks to once a month, will permit better determinations of worker exposures. Notably, exposures which were below the threshold limit of the dosimeter with a two week change over frequency might now, with a monthly change over, indicate exposure due to the longer time to accumulate gamma radiation.

Approval of this amendment with license Condition No. 25, 27, and 28 reading as follows is recommended:

25. A. Notwithstanding the effluent and environmental monitoring specified in the documents listed in Condition No. 10 of this license, the licensee shall implement the effluent and environmental monitoring program described in Enclosure A to Amendment No. 6 of SUA-551.

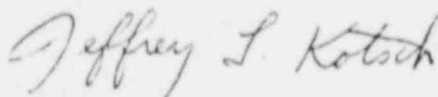
In addition, the licensee shall submit the following by July 14, 1980 for NRC review and approval:

- 1) A quality assurance program that includes all of the recommended elements of a quality assurance program specified in Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment," February 1979.
 - 2) A map showing all locations for air particulate, radon, surface water, groundwater, vegetation, soil and sediment sampling.
- B. Regarding the groundwater monitoring wells located around the tailings pond the licensee shall:
- 1) Drill three new monitor wells by July 1, 1980 to replace wells RTH 1, 2 and 3 which are not functional wells and submit the following data by July 14, 1980 on these wells:
 - a) Geologic well logs (note lithologic changes and saturated zones)
 - b) Method of drilling, well development
 - c) Casing depths and open intervals

- d) Well completion information (method and details of gravel packing and grouting)
- e) Casing elevation above land surface
- f) Static water level elevation

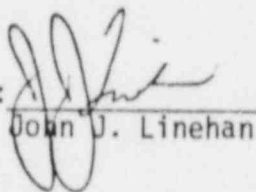
These wells must be of sufficient diameter to accomodate a submersible pump for representative sample collection.

- 2) Provide by July 14, 1980, the rationale for selection of the locations, depth, and perforated zone for wells RTH 4 and RTH 5.
27. The results of all effluent and environmental monitoring required by this license shall be reported in accordance with 10 CFR 40, Section 40.65 with copies of the report sent directly to the Uranium Recovery Licensing Branch, U. S. NRC, Washington, D.C. 20555.
28. Notwithstanding any conflicting provisions in Section 4 of the Radiation Safety Program contained in the documents listed in Condition No. 10 of this license, the licensee shall make the following changes in the Radiation Safety Program:
- a) An alpha survey instrument shall be used at the main mill exit for the purpose of employee self-monitoring.
 - b) All mill personnel shall be required to wear a film badge or equivalent dosimeter. This dosimeter shall be changed on a monthly basis.



Jeffrey L. Kotsch
Uranium Recovery Licensing Branch
Division of Waste Management

Approved by:



John J. Linehan

Petrotoomics Radiological Effluent and Environmental Monitoring Program

1. Stack sampling

A. Yellowcake dryer and packaging stack

1. Quarterly, isokinetic sample.
2. Analyze for U-natural, Th-230, Ra-226, and Pb-210 quarterly.
3. Stack flow measurement quarterly.

B. Cooler stack

1. Semiannual, representative grab sample.
2. Analyze for U-natural, Th-230, Ra-226, and Pb-210 semiannually.
3. Stack flow measurement semiannually.

2. Air particulate sampling

A. Four samplers at or near site boundaries

B. One sampler downwind between restricted boundary and site boundary

C. One sampler at Shirley Basin Townsite

For each:

Continuous sampling

Quarterly composite and analysis by location of weekly samples

Analyze for U-natural, Th-230, Ra-226, and Pb-210

3. Radon sampling

A. Six locations - same as air particulate samplers

B. Continuous sampler at Townsite

C. Other sites for at least one week each per month

D. Wind speed and direction information, by week, for correlation with radon sampling, unless sampling is continuous at all locations.

E. A continuous WL monitoring in the on-site worker's living quarter.

4. Ground Water

- A. Five tailings monitor wells
- B. One control well at mine shop
- C. One well at Townsite

For each:

- Quarterly grab sample and analysis
- Analyze for dissolved U-natural, Th-230, Ra-226, Pb-210 and Po-210 (include analysis for suspended fractions for mine shop water samples)
- Analyze for non-radiological constituents as stated in Table 6.1 of Split Rock Uranium Mill FES, NUREG-0639 February, 1980.

5. Surface Water

- A. Mill Feed pond
- B. Three locations on Little Medicine Bow River
- C. Sand Draw - when water present

For each:

- Quarterly grab sample and analysis
- Analyze for dissolved and suspended U-natural, Th-230 Ra-226, Pb-210, and Po-210

6. Vegetation

- A. Four grazing areas downwind of mill
- B. One upwind site

For each:

- Grab sample three times during the grazing season
- Analyze for Ra-226 and Pb-210

7. Soil

A. Four site boundary locations, same as for air particulate samples

B. One location at Townsite

For each:

-Annual grab sample

-Analyze for U-natural, Ra-226 and Pb-210

8. Sediments

A. Sand Draw

B. Grab sample annually at a minimum of two locations between the tailings embankment and the junction with Sand Creek

C. Analyze for U-natural, Th-230, Ra-226, and Pb-210

9. Direct Radiation

A. Four site boundary locations, same as for air particulate samples

B. One location at Townsite

For each:

-Quarterly change and reading of TLD's

10. The lower limits of detection for analysis of samples collected in this monitoring program shall meet the LLD's listed in Regulatory Guide 4.14, Revision 1, "Radiological Effluent and Environmental Monitoring at Uranium Mills," April 1980.