

Mr. John Darke
Box 703
Copper Queen Station
Bisbee, Arizona 85603

DEC 21 1992

Dear Mr. Darke:

This is a follow-up to our telephone conversation between you, Mr. Russell Powell, Chief, Freedom of Information/Local Public Document Room Branch, and me on November 25, 1992, concerning information on past disposal of non-11e.(2) byproduct material in uranium mill tailings impoundments.

As I indicated in our telephone conversation, the development of our Commission Paper, SECY-91-243, was in progress before I assumed responsibility of the Uranium Recovery Branch. I indicated that the examples included in SECY-91-243 of past disposal of non-11e.(2) byproduct material were, to my knowledge, all that the staff had been able to identify. The statement in SECY-91-243 that uranium mills have occasionally disposed of small quantities of non-11e.(2) byproduct material waste was written to provide appropriate background information simply that this activity had occurred. I did not believe, however, that any effort had been made to identify specifically these past disposal actions.

Since our telephone conversation, I discovered that before I assumed responsibility for completing the Commission Paper, the staff had included, in earlier versions of the Paper, anecdotal descriptions of some instances of past disposal of non-11e.(2) byproduct material in uranium mill impoundments. I am enclosing a copy of that section of a 1990 draft version of this Commission Paper.

To the best of my knowledge, this information is all that is readily available without requiring significant staff resources to search docket and other files to either provide further documentation on the examples discussed or to identify a complete listing of any other non-11e.(2) byproduct material disposal.

Sincerely, *Original Signed By*
JOHN J. SURMEIER
John J. Surmeier, Chief
Uranium Recovery Branch
Division of Low-Level Waste Management
and Decommissioning
Office of Nuclear Material Safety
and Safeguards

Enclosure: As stated
cc: Russell Powell, ADM/LPDRB

(Ticket 92-XXX)

DISTRIBUTION: Central File NMSS r/f RBangart WBrach
JAustin SBahadur LLWM r/f LLUR r/f

In small box on "OFC:" line place a: C = Cover E = Cover & Enclosure N = No Copy

| | | | | | | | | | |
|-------|--------------|---|--|--|--|--|--|--|--|
| OFC : | LLWM | | | | | | | | |
| NAME: | JSurmeier/es | | | | | | | | |
| DATE: | 12/1/92 | E | | | | | | | |

Path & File Name:

OFFICIAL RECORD COPY

040000 PDR : YES ☒ NO ☐
ACNW: YES ☒ NO ☐

Category: Proprietary ☐ or CF Only ☐
Delete file after distribution Yes ☒ No ☐

9301050246 921221
PDR WASTE
WM-3 PDR

205
WM-3
NL14

STAFF ANALYSIS OF DISPOSAL OF NON-BYPRODUCT MATERIAL INTO URANIUM MILL TAILINGS PILES

D. TYPES OF WASTES BEING PROPOSED FOR DISPOSAL INTO TAILINGS PILES

Previously, the NRC had allowed a limited number of such disposals on their individual merits, because the requested disposal could occur without significantly affecting safety or the environment. In the following brief case histories, the NRC approved of processing or disposal of radioactive waste materials, or both, at uranium mill tailings sites:

Example 1. Wastes from Domestic Water Purifying Operations.

In 1987 at the Ambrosia Lake uranium mill in New Mexico, the NRC allowed the Quivira Mining Company (the licensee) to elute uranium from contaminated ion-exchange resins from the Navajo Indian Nation's well water purifying operations in New Mexico and Arizona. The licensee combined the resultant wastes with other ion-exchange residues from Quivira's operations. The licensee disposed of the combined spent resins in the uranium mill tailings pile.

Although the surface wastes from an in-situ solution mine, including such spent resins, are classified as 11e.(2) byproduct material, the wastes from the Navajo water purification operations would not be considered as such, despite the physical and chemical similarity.

Example 2. Processing Wastes from Other Extraction Operations

The Rio Algom Lisbon uranium mill in Utah has received waste residue from 4 facilities in the last 7 years. These wastes include the following:

- 1) Waste residues from the Mallinckrodt, Incorporated, niobium-tantalum recovery facility in St. Louis, Missouri;
- 2) Waste residues from the Unical-Molycorp yttrium-lanthanides recovery facility in Louviers, Colorado;
- 3) Waste residues from the Allied Chemical Company's Metropolis, Illinois, uranium hexafluoride (UF_6) conversion facility; and
- 4) Waste residues from the Westinghouse Electric Corporation's Bingham Canyon, Utah, uranium secondary recovery ion-exchange facility.

At these facilities, the volume of waste ranged from minimal amounts to less than 1 percent of the annual throughput. The waste materials were radiologically consistent with the existing tailings, and only fluoride was in higher concentration (greater than 1 percent) than the levels typical of the existing tailings. In the first three waste disposals, the Lisbon facility extracted the uranium from the residue. At the UF_6 conversion facility, the uranium concentration in the residue was as high as 6.7 percent.

The residues from the secondary recovery facility (the fourth instance of waste disposal in the list) were buried in a pit excavated in the tailings pond. In this case, a secondary processing operation, licensed by an Agreement State, has been added to the primary circuit. The majority of the waste is returned to the waste circuit of the primary recovery facility. Generally, the NRC or the Agreement States do not license these primary circuits. The Anaconda Copper Mill provides a sidestream to the Bingham Canyon facility. The State licenses the Bingham Canyon facility for the use and possession of source material, but no such AEA-related license is issued to the Anaconda Copper Mill. The waste sidestream is returned to the copper mill following chemical extraction by the Bingham Canyon plant. Waste residues (such as spent resins) from Bingham Canyon are considered source material and must be disposed of as low-level waste. The phosphate fertilizer industry in Florida and Louisiana has a similar situation. In these instances, uranium is extracted in a secondary recovery, and the resulting wastes are combined with primary recovery wastes and disposed of outside of NRC regulatory authority.

In 1987, the NRC authorized the Quivira Mining Company to process residue from the Sequoyah Fuels Corporation's UF_6 conversion plant in Gore, Oklahoma. The Quivira Ambrosia Lake, New Mexico, Uranium Mill will extract uranium from these residues and dispose of these wastes into the tailings pile. The uranium content of this alternate feed material (0.61 percent) is higher than the average uranium content of ore processed in the United States, but the amount of residue processed to date is less than the total quantity of byproduct material produced during 3 days of full production at the Ambrosia Lake facility.

Example 3. Recovery of Uranium from Mine Water (Mine Water Cleanup)

By amending the source and byproduct material license for particular mines, the NRC has extended the mill circuit and has authorized operation of ion-exchange units at mine sites. Instances of this type of extension include the following:

1. Western Nuclear, Inc.'s Split Rock uranium mill in Jeffrey City, Wyoming, processed residues from the Green Mountain mine ion-exchange water purification operations for the uranium content. The mine water was discharged under a National Pollutant Discharge Elimination System (NPDES) permit, and the combined residues were disposed of in the mill tailings pond.
2. Atlas Minerals Corporation's uranium mill in Moab, Utah, processed ion-exchange residues from the dewatering operations at the Velvet mine. The Velvet mine generated these residues to meet the requirements of an NPDES permit issued by EPA. An NRC license was not issued to the Velvet mine until the pregnant residues were brought to the Atlas mill for processing. The stripped residues were discharged to the mill tailings ponds, and the water was released under an NPDES permit from EPA.
3. Sequoyah Fuels Corporation's (now Rio Algom Corporation) research and development solution mining project in the South Powder River Basin, Wyoming, eluted ion-exchange columns from a nearby, company-

owned mine. The residues were discharged to onsite evaporation ponds along with resins from the in-situ operation. The ponds will be eventually cleaned, and the remaining waste will be disposed of at a licensed uranium mill tailings site.

In these cases, the NRC staff interpreted these "alternate feed materials" as being refined or processed ores (See 10 CFR 40.4(k)). The NRC regional counsel had suggested this interpretation of the regulations and the intent of the UMTRCA (See Enclosure D). With this interpretation, the resultant wastes were legitimately classified as 11e.(2) byproduct material.