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**UTILIZING DAWN MINING COMPANY FOR STORAGE OF FERNALD
WASTE**

09/11/95

DOE-1442-95
DOE-FN CITIZEN
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LETTER



Department of Energy
Fernald Environmental Management Project
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SEP 11 1995
DOE-1442-95

Anthony Sears



Dear Mr. Sears:

UTILIZING DAWN MINING COMPANY FOR STORAGE OF FERNALD WASTE

At the August 8, 1995, Community Meeting you expressed concerns regarding whether the Department of Energy, Fernald Area Office (DOE-FN) had properly investigated a disposal site located in the State of Washington for its possible use in receiving the Fernald Environmental Management Project (FEMP) remediation waste. You felt that the disposal fee (i.e., up to 50 percent less than Envirocare) for the facility would render it more cost effective to ship materials to this facility than place them into an on-site disposal facility at the FEMP. This letter provides a more detailed response to your concerns. We realize that much of the information contained in this letter is of a technical nature, and we will be happy to attend a Morgan Township trustee meeting to discuss this matter with you and respond to any questions you might have.

The reasons Fernald did not select the Dawn Mining Company as a waste disposal site are twofold. First, the facility's license restricts its ability to accept many types of Fernald wastes. Second, transportation costs render it impractical and more costly than on-site storage.

The site you referred to at the Community Meeting is owned by the Dawn Mining Company and is located in Ford, Washington. The Dawn Mining Company was recently issued a license by the State of Washington to receive radioactive materials for disposal at its uranium mill facility. This license contains two key provisions which are relevant to the potential receipt of materials from the FEMP. These provisions identify the classification of materials that may be received at the facility and establish concentration-based waste acceptance criteria.

Under the terms of the current license issued by the State of Washington to Dawn Mining Company the facility may only receive what is termed 11(e)2 byproduct materials. This waste classification, 11(e)2 byproduct, is defined under the Atomic Energy Act as the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content. Under this definition only a

very limited amount of Fernald waste materials could be classified as 11(e)2 byproduct. Only the materials in the K-65 Silos and Silo 3 (Cold Metal Oxides) would meet the definition of 11(e)2 byproduct. However, for reasons outlined herein, the K-65 materials could not be accepted by Dawn Mining.

Present in Fernald uranium feed materials recycled from Hanford and other DOE sites are minute concentrations of transuranic radionuclides (eg. plutonium, etc.) and fission products (eg. technetium). These impurities in the FEMP feed materials carried through, to some extent, in all processes, secondary products, wastes and primary products produced after 1962. The occurrence of these low concentrations of transuranic and fission product impurities has been highly discussed and publicized. Low concentrations of these radionuclides are present in the waste pits, the contaminated construction materials comprising the production buildings and the soil under and adjacent to the production area. Wastes generated at the FEMP through the processing of reactor recycle material would be classified as low-level waste and could not be termed 11(e)2 byproduct materials.

Low-level waste is a separate classification of waste defined within the Atomic Energy Act. Similarly, any existing wastes at the FEMP blended with waste produced from the processing of reactor recycle material, such as the waste pit materials, could not be termed 11(e)2 byproduct materials. Soil contaminated through contact with wastes from the processing of reactor recycle material would be considered low level wastes and could not be termed 11(e)2 byproduct materials. *Thus, as previously stated, the only materials which could be termed 11(e)2 byproduct materials at the FEMP would be the K-65 residues, contained in Silos 1 and 2, and the contents of Silo 3. However, because of radionuclide concentrations, not even the K-65 or Silo 3 materials can be shipped to Dawn Mining.*

The Dawn Mining Company, like all other commercial disposal facilities licensed for radioactive material, established concentration-based waste acceptance criteria. These criteria establish the maximum concentration of a given radionuclide that could be received at the facility for disposal under the terms of their license. For the Dawn Mining Company, these criteria are limited to those radionuclides that would be found in 11(e)2 byproduct materials. Other radionuclides not traditionally found in 11(e)2 byproduct materials, such as transuranic and fission products, are not considered within the Dawn Mining Company license and cannot be received for disposal. The average concentration in wastes received at Dawn mining Company site cannot contain greater than 570 picoCuries per gram (pCi/g) of radium-226 and 650 pCi/g of thorium-230. The K-65 residues contain in excess of 470,000 pCi/g of radium-226 and thus could not be received at Dawn Mining Company for disposal. This concentration would not change substantially following vitrification of the residues. The wastes within Silo 3 (Cold Metal Oxides) contain in excess of 3800 pCi/g of radium-226 and in excess of 60,000 pCi/g of thorium-230. Therefore, the contents of Silo 3 could not be received at the Dawn Mining Company site for disposal under the terms of their existing license. *No other material at the FEMP, by Atomic Energy Act definition, could be received at the Dawn Mining Company under the terms of their existing license.*

In summary, the Dawn Mining Company license restricts the facility to the receipt of 11(e)2 byproduct materials within a limited range of concentration for a number of radionuclides within the uranium decay series. The FEMP site has limited material which meet the definition of 11(e)2 byproduct. The materials which do meet this definition, the K-65 residues and Silo 3 wastes, exceed the concentration-based waste acceptance criteria for the Dawn Mining site by up to three orders of magnitude and thus could not be received at this facility for disposal. Several additions and improvements to transportation infrastructure would be required to transport waste currently anticipated to be disposed of on-site to the Dawn Mining Company. Waste meeting the current on site Waste Acceptance Criteria would be loaded into intermodal shipping containers and transported from the FEMP to Spokane, Washington. The waste would then be transported by truck to the Dawn Mining Company for disposal. This hypothetical evaluation assumes that Dawn Mining Company has received an amendment to the current license and is now able to accept low level waste, and that license conditions and waste acceptance criteria are equivalent to the Envirocare site.

When compared to on-site disposal the logistics of transporting the large volumes of waste that will be generated during the cleanup are extremely complex. The following information is based on our calculations regarding transport of waste to the Dawn Mining facility.

The total volume of FEMP waste which has a potential to be shipped is in excess of 2,359,600 cubic yards. The time frame for transport under a 10-year plan (mid FY 96 through FY 06) is about 500 weeks. Eighteen yards of waste material can be placed in an intermodal container and still meet the criteria for over the road weight limits. This will generate approximately 131,100 intermodal containers. Over the period an average of 262.2 containers would be generated per week. It is assumed that unit trains would be used to transport waste to Dawn Mining Company. Each unit train would consist of 40 spline cars carrying six intermodal containers. This yields the shipment of 1.1 train per week or a total of 550 trains. The average trip time for the round trip to Spokane is approximately 24 days. The FEMP would need a supply of cars and containers during this period for loading and to support continuous operations. During operations, FEMP would need a supply of 900 intermodal containers, over the operational life about 5% of the containers will become damaged or need replacement. So the entire operation would require 1260 (900x.05x8) containers, and approximately 150 spline cars for container transport. To meet the increased rail demand, the rail infrastructure would need to be upgraded on the FEMP to handle larger and heavier rail cars. Spline cars are much longer than gondola cars and several curves on the site would require upgrades. Also, sufficient facility space does not exist on the site for storage of empty or full cars so outside upgrades would be necessary as well. Spline cars and intermodal containers are high demand items and would require purchase orders. The expected cost per cubic yard for transport and disposal to Dawn Mining would be \$317.26. This cost compares to an average of \$160.00 per cubic yard for disposal on-site. This cost estimate does not include the cost for upgrade of internal facilities upgrade and refit of the Shandon switchyard or construction of new rail lines to support additional railcars needed by this project.

If you have any questions, please contact me at (513) 648-3101.

Sincerely,



Jack R. Craig
Director

FN:Stegner

cc:

- J. Applegate, FCTF
- R. Janke, DOE-FN
- D. Rast, DOE-FN
- D. Carr, FERMCO/52-5
- J. Jackson, FERMCO/52-5
- M. Jewett, FERMCO/52-5
- P. Richardson, FERMCO/82-3
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114