

STATE OF MICHIGAN



WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF PUBLIC HEALTH

3500 N. LOGAN
P.O. BOX 30035, LANSING, MICHIGAN 48909
BAILUS WALKER, JR., Ph.D., M.P.H., Director

November 2, 1982

40-17

Mr. Paul F. Oreffice, President
Dow Chemical Company
2030 Dow Center
Midland, Michigan 48640

Dear Mr. Oreffice:

This letter concerns the planned movement of thorium-contaminated soil from the Dow Chemical Company Midland Plant to the Dow Chemical Company Bay City Plant as described in a letter with enclosures of October 21, 1982 from R. A. Olson, Dow Chemical Company, to R. G. Page, U. S. Nuclear Regulatory Commission (NRC).

A detailed evaluation of the Dow information has been prepared by the Radiological Health Services Division and is attached. We are concerned about the public health aspects associated with the proposed plan to move the radioactively contaminated material to another site, rather than disposing of the material in an approved, licensed disposal site. Further, the proposed movement of the contaminated soil from Midland to Bay City may be a violation of Act 113 of the Public Acts of 1978.

The only apparent advantage of the proposed movement would be the deletion of the Midland site from NRC Source Material License STB-527. A disadvantage would be the exacerbation of the problem that has existed at Bay City since 1970 by the addition of material which has not been thoroughly evaluated. Since 1970 this Department has received repeated specific assurances by Dow that the storage at Bay City was only a temporary expedient and that it would be permanently disposed in accordance with NRC regulations and State law. The proposal to deposit additional radioactive material at the same site represents a departure by Dow from this position.

In addition, in an October 9, 1979 letter from NRC to Dow, the NRC requested that Dow submit a "comprehensive plan for removal and disposal of all magnesium-thorium wastes now in your [Dow's] possession including soils containing thorium contamination". The NRC position as stated in the 1979 letter clearly supports removal and permanent disposal.

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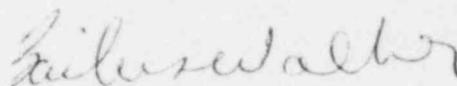
Mr. Paul F. Oreffice, President
November 2, 1982
Page 2

Although Department and joint Department-NRC analyses of samples from the Bay City site during the 1970s revealed no imminent migration of the material into the environs, we are concerned that such migration may occur in the future.

The Michigan Department of Public Health believes that, in the interest of public health protection, a permanent solution should be sought. In this regard, both the thorium sludge at Bay City and the contaminated soil at Midland should be disposed in a licensed radioactive material disposal facility.

Therefore, I am requesting Dow Chemical Company to halt the proposed excavation and shipment of thorium-contaminated soil from Midland to Bay City until a method of disposal can be developed which does not worsen the situation. We also ask that Dow submit a plan to accomplish the disposal of the subject radioactive material at Midland and Bay City.

Sincerely,



Bailus Walker, Jr., Ph.D., M.P.H.
Director

Radiological Health Services Division
Dow Thorium Problem

Review of Dow Chemical Company Letter of October 21, 1982
with Enclosures

Our review of the letter and enclosures revealed several problems.

On page 1 of the "Plan for Decommissioning the Midland, Michigan Thorium Slag Storage Site for License STB-527" in the "Transportation" paragraph; "0.00009 Ci/gram" should be "0.00009 μ Ci/gram", "0.002 Ci/gram" should be "0.002 μ Ci/gram", and "49 CFR 173.39" should be "49 CFR 173.389".

On Appendix 1, page 2, "Total Thorium Activity (Ci)" at the end of the 3rd line, " $\frac{x \text{ Ci}}{10} \text{ }_{-12} \text{ pCi}$ " should be " $\frac{x \text{ }_{-12} \text{ Ci}}{\text{pCi}}$ " or " $\frac{\text{Ci}}{10^{12} \text{ pCi}}$ ". On the next line there is an extra " $\times 10^{-12}$ " at the end of the line.

In the "Storage" paragraph of page 1 the Bay City storage site is estimated to contain 75,500 pounds of thorium. Our records show, in a letter of December 3, 1970 from Joel Charm, Dow Chemical Company, to Donald E. Van Farowe, Michigan Department of Health, that there was a total of 4,640,000 pounds of sludge of which about 66,000 pounds was thorium (1.4% of sludge) at a concentration of $1.7 \times 10^{-3} \mu\text{Ci}$ of thorium per gram of sludge (1700 pCi/gram). The volume was estimated at 3,260 cubic yards (88,200 cubic feet). If these estimates have been changed and are not current, the current figures and the basis for the change are needed.

On page 2 the "Monitoring" section seems to indicate that the Micro R Meter readings would be used to express equipment contamination in terms of pCi/g m. A conversion factor as indicated may be applicable for soil monitoring, but is not applicable for equipment contamination, which is a surface phenomenon. Equipment contamination should be monitored as near the surface as possible rather than at a distance of a meter.

On page 1 of Appendix 1 the "Background" section is misleading. The first paragraph seems to indicate that NRC Source Material License STB-527 was originally granted on March 9, 1973. Our files indicate that the thorium sludge was accumulated starting in the 1950s, and we have a copy of a renewal of NRC Source Material License STB-527 dated March 26, 1965, indicating that the original license was granted in 1962. When Dow proposed to the Department in 1970 that the sludge be disposed in a land-fill not licensed for radioactive material disposal, our investigation revealed that Dow was not licensed to possess the sludge. As a result, Dow applied for an amendment to the license, and STB-527 was amended in a letter of January 14, 1971 from the AEC (now NRC), allowing the possession of up to 200,000 pounds of metal or process sludge. The March 9, 1973 STB-527 license (Amendment No. 05) also incorporated this change.

Appendix 2 quotes soil concentration measurements by the NRC (letter from M. Oestman to Dow dated June 18, 1982) and by Dow. The basis of the measurements is not included. In the Appendix 2, page 2, "Volume of Soil (FT3)" section the average depth is estimated at one foot. No basis is given for the one foot assumption. If the soil concentration measurements did not involve a complete profile down to and beyond the one foot depth, the "Volume of Soil" assumption could be either high or low by a factor of ten (10) or more. There is no justification in the Decommissioning Plan for not assuming that the thorium contamination is merely a surface condition or, conversely, that the contamination extends to a depth of several feet.

The foregoing review of the technical and historical aspects of the Dow Decommissioning Plan reveals certain inaccuracies and errors which warrant resolution. Dow has repeatedly assured this Department of its intention to use the Bay City site as a temporary storage location, pending removal and permanent disposal. The NRC has also expressed support for removal and permanent disposal. According to current NRC regulations, the Bay City storage site can not be designated as a permanent disposal site. In addition, the proposed movement of radioactive material from Midland to Bay City may be a violation of Act 113, P. A. 1978. Although previous analyses by this Division and the NRC of the Bay City site revealed no imminent environmental or public health hazard, there is a potential adverse public health impact associated with the long-term storage of radioactive material at the site.

Therefore, it would be in the public health interest to request that the Decommissioning Plan not be approved or implemented until the technical, regulatory, legal, and public health concerns have been resolved.