

POLICY ISSUE
(NEGATIVE CONSENT)

SECY-00-0172

August 10, 2000

FOR: The Commissioners
FROM: William D. Travers
Executive Director for Operations
SUBJECT: REMOVAL OF MINNESOTA MINING AND MANUFACTURING COMPANY'S KERRICK SITE FROM THE SITE
DECOMMISSIONING MANAGEMENT PLAN

- **PURPOSE:**
- **BACKGROUND:**
- **DISCUSSION:**
- **COORDINATION:**
- **RECOMMENDATION:**

PURPOSE:

To inform the Commission that a former burial permitted by the Atomic Energy Commission (AEC) under 10 CFR 20.304 at the Minnesota Mining and Manufacturing Company (3M) site, in Kerrick, Minnesota, meets the radiological criteria for unrestricted use in [10 CFR 20.1402](#). The staff plans to release the site for unrestricted use and remove the site from the Site Decommissioning Management Plan (SDMP).

BACKGROUND:

The 3M site was brought to the attention of the U.S. Nuclear Regulatory Commission (NRC) in 1989 by the Minnesota Pollution Control Agency (MPCA). MPCA inquired about NRC jurisdiction over sites where waste was buried in accordance with 10 CFR 20.304. In August 1990, NRC's Office of the General Counsel concluded that NRC does have jurisdiction over material buried under 10 CFR 20.304, even if the license had been previously terminated. The site was placed on the SDMP because it contains on-site disposals of radioactive material and has previously terminated licenses (SMB-239 and SNM-764) under the AEC.

AEC Source Material License No. SMB-239 was issued on May 9, 1961, and was terminated on May 2, 1967. This license authorized the licensee to use 500 kilograms (kg) [1100 pounds (lbs)] of source materials to conduct research and development into the production of uranium dioxide and thorium dioxide micro-spheres as nuclear fuel.

AEC Special Nuclear Material License No. SNM-764 was issued to 3M on January 17, 1964, and was terminated on October 31, 1967. This license authorized the use of both enriched uranium-235 (93 percent) and 180 grams (0.40 lbs) of plutonium, for research and development of loading fuel into space nuclear auxiliary power systems, and scrap recovery from fuel production activities. All licensed activities involved in this operation were being conducted under a classified government contract.

The site, located about 8 kilometers (km) [5 miles (mi)] east of the city of Kerrick in Pine County, Minnesota, is owned by 3M and was used for disposal of wastes associated with the above activities. This site consists of approximately 2,100,000 square meters (m²) (520 acres). 3M made four burials at this site between December 7, 1966, and November 27, 1968. 3M selected this site based on its meeting the 3M site selection criteria of having: (1) proper geological conditions; (2) accessibility by truck for transport purposes; and (3) isolation from any population center. The nearest resident is located about 2.4 km (1.5 mi) from the site.

Contamination at the site consists of uranium (U)- and thorium (Th)- contaminated scrap materials (lockers, piping, duct work, and other scrap) sealed in steel drums and buried under a minimum of 1.2 meters (4 feet) of soil, conducted in accordance with former 10 CFR 20.304 regulations. The total amount of waste estimated to be buried at the site is 55.9 megaBecquerel (MBq) [1.51 millicuries (mCi)] of Th-232; 115.1 MBq (3.11 mCi) of U-238; and 443.6 MBq (11.99 mCi) of U-235 (93 percent enriched). There is no known off-site contamination from this burial site.

Monitoring of the burial site has occurred irregularly since the waste was emplaced. NRC initiated an environmental sampling program at the site on July 20, 1992, that continued through October 20, 1992. The Minnesota Department of Health (MDH), 3M, and MPCA staff also participated in this environmental sampling program. The program included independent radiological surveys; placement and collection of thermoluminescent dosimeters and radon monitors; collection of surface and groundwater, vegetation, soil, and particulate air samples; and collection of soil bore samples. The program also consisted of a selective examination of representative records from the former license files, including historical environmental sampling results, observations, independent measurements, and interviews with personnel.

A review of all environmental sampling data indicated that the site did not represent a threat to public health and safety or the environment, because the environmental measurements taken were consistent with natural background radiation levels in Minnesota. These findings were confirmed by data acquired and analyzed by 3M and the MDH.

Inspections were also conducted on August 1, 1997, and September 23, 1998, primarily to evaluate access control and general physical conditions of the site. The inspection consisted of a general walk-over tour of the burial site and discussions with 3M's staff regarding its actions to maintain the site. The burial site is approximately 457 m [500 yards (yds)] from the nearest point of vehicle access, and this access point is controlled by a locked gate. Site access is controlled by a fence. Radiation measurements did not identify any radiological levels greater than ambient background levels. No concerns, violations nor deviations were identified during the inspection.

During 1992 and 1993, NRC performed dose assessments to determine whether additional remediation would be required to release the 3M site for unrestricted use. On October 14, 1994, NRC provided a copy of the dose assessment to 3M for review and comment. 3M responded to NRC's dose assessment on January 31, 1995, claiming the assessment was flawed. NRC did not respond directly to this contention; however, in May 1995, NRC notified 3M that a decision on the outcome of the issues associated with the site would be deferred, pending promulgation of the rulemaking on "Radiological Criteria for Decommissioning" and completion of the Shieldalloy Draft Environmental Impact Statement (DEIS). On August 20, 1997, NRC notified 3M that the Shieldalloy DEIS did not provide information directly applicable to the 3M site. In addition, NRC requested that 3M provide a schedule for decommissioning the site, considering the available options under 10 CFR Part 20, Subpart E.

On February 25, 1998, 3M submitted a dose assessment (in which the groundwater pathway was excluded as a viable exposure pathway) to demonstrate that site remediation was not necessary. The staff concluded that there was insufficient justification for ruling out the groundwater pathway as a viable exposure pathway. In fact, when the groundwater pathway was included in the dose assessment, it was the dominant exposure pathway. The staff also completed a sensitivity analysis, which showed that, assuming the groundwater pathway is a viable exposure pathway, the calculated dose and arrival time of peak dose, are most sensitive to the distribution coefficient (K_d) for uranium. NRC notified 3M on March 22, 1999, that the dose assessment was inadequate, and that 3M should provide NRC with a remediation plan (RP) and a schedule for decommissioning the site by May 6, 1999.

3M requested, and received, approval to delay submitting its RP until November 1, 1999, so that additional site-specific hydrologic data could be collected. On October 28, 1999, 3M submitted such data, supporting a revised dose assessment. Staff reviewed the submittal and concluded that more information was needed before it could accept the dose assessment as demonstration that the unrestricted release criteria in 10 CFR 20.1402 were met. A meeting was held with 3M representatives on December 14, 1999, to discuss the staff's review of the 3M dose assessment. It was decided at this meeting that, for NRC to accept the dose assessment as demonstration that 10 CFR 20.1402 criteria were met, 3M would provide the following information to NRC: either site-specific uranium K_d values that were greater than those used in the previous dose assessment; or other hydrologic information that supported 3M's claims that the groundwater pathway could be eliminated from the dose assessment.

On May 31, 2000, 3M submitted information on the derivation of a site-specific uranium K_d value. The staff accepted the procedure used in deriving the uranium K_d , and concluded that the value was adequate to demonstrate that the groundwater pathway is not the dominant exposure pathway during the regulatory period of compliance and the dose requirements in 10 CFR 20.1402 will be met.

DISCUSSION:

Based on site-specific information 3M has provided, and review of dose assessments 3M has performed, the staff concludes that the calculated doses are less than the dose limits

in 10 CFR 20.1402 (25 millirems per year including that from groundwater sources, and the residual radioactivity has been reduced to levels that are as low as reasonably achievable), and therefore, the 3M Kerrick site is suitable for release for unrestricted use. NRC staff intends to inform the U.S. Environmental Protection Agency (EPA), MDH, and 3M, of NRC's intent to release the 3M Kerrick site for unrestricted use and remove it from the SDMP. Draft letters are attached (see [Attachments 1, 2, and 3](#)).

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objections.

RECOMMENDATION:

Although we consider this action to be within the delegated authority of the Director of the Office of Nuclear Material Safety and Safeguards, action will not be taken until the staff requirements memorandum is received. The staff requests action within 10 days.

/RA/

William D. Travers
Executive Director for Operations

CONTACT: Kristina L. Banovac, NMSS/DWM

301-415-5114

- Attachments: 1. [Draft letter to EPA](#)
2. [Draft letter to MDH](#)
3. [Draft letter to 3M](#)
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ATTACHMENT 1

Mr. Stephen D. Luftig, Director
Office of Emergency and Remediation Response
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

Dear Mr. Luftig:

This letter is to inform the U.S. Environmental Protection Agency (EPA) that the U.S. Nuclear Regulatory Commission (NRC) is preparing to authorize release of land for unrestricted use at the Minnesota Mining and Manufacturing Company (3M) site in Kerrick, Minnesota.

The staff is providing this information to EPA in accordance with NRC policy contained in the "Action Plan to Ensure Timely Cleanup of Site Decommissioning Management Plan Sites" (57 FR 13389), which states that NRC will inform EPA about specific decommissioning actions at Site Decommissioning Management Plan (SDMP) sites.

In 1961, the Atomic Energy Commission (AEC) issued a license, to 3M, which authorized the use of source materials to conduct research and development into the production of uranium dioxide and thorium dioxide micro-spheres as nuclear fuel. AEC also issued 3M a license that authorized the use of enriched uranium and plutonium for research and development of loading fuel into space nuclear auxiliary power systems, and scrap recovery from fuel production activities. Both licenses were terminated in 1967.

The 3M site was brought to the attention of the NRC in 1989 by the Minnesota Pollution Control Agency (MPCA). MPCA inquired about NRC-licensed sites where waste was buried in accordance with 10 CFR 20.304. The site was placed on the SDMP list because it contains on-site disposals of radioactive material and has previously terminated licenses (SMB-239 and SNM-764) under the AEC.

Since the site was placed on the SDMP, 3M has supplied, and NRC has reviewed, site characterization and dose assessment information. A conservative dose assessment, which incorporates site-specific data recently supplied by 3M and reviewed by NRC, demonstrates that the unrestricted release criteria in 10 CFR 20.1402 have been met. Based on NRC's review of the dose assessment, NRC concludes that the site is suitable for release for unrestricted use, and the site will be removed from the SDMP.

The project manager for the 3M site is Kristina L. Banovac. If you have any questions on this matter, please contact her at (301) 415-5114.

Sincerely,

Larry W. Camper, Chief
Decommissioning Branch
Division of Waste Management
Office of Nuclear Material Safety and Safeguards

Docket Nos. 040-01020 and 070-00832
Former License No. SMB-239 and SNM-764

ATTACHMENT 2

Ms. Susan McClanahan
Minnesota Department of Health
Section of Radiation Control
121 E. Seventh Place, Suite 220
P.O. Box 64975
Minneapolis, MN 55164-0975

Dear Ms. McClanahan:

This letter is to inform the Minnesota Department of Health that the U.S. Nuclear Regulatory Commission (NRC) is preparing to authorize release of land for unrestricted use at the Minnesota Mining and Manufacturing Company (3M) site in Kerrick, Minnesota.

On May 31, 2000, 3M submitted site-specific data for use in a conservative dose assessment that demonstrated that the unrestricted release criteria in 10 CFR 20.1402 were met. Based on NRC's review of the dose assessment, NRC concludes that the site is suitable for release for unrestricted use, and the site will be removed from the Site Decommissioning Management Plan.

The project manager for the 3M site is Kristina L. Banovac. If you have any questions on this matter, please contact her at (301) 415-5114.

Sincerely,

Larry W. Camper, Chief
Decommissioning Branch
Division of Waste Management
Office of Nuclear Material Safety and Safeguards

Docket Nos. 040-01020 and 070-00832
Former License No. SMB-239 and SNM-764

cc: Mr. Dale J. Trippler
Minnesota Pollution Control Agency

ATTACHMENT 3

Mr. Frederick B. Entwistle, Manager
Ionizing Radiation, Health Physics Services
Minnesota Mining and Manufacturing Company
3M Center, Building 220-3W-06
P.O. Box 33283
St. Paul, MN 55133-3283

Dear Mr. Entwistle:

This letter is to inform the Minnesota Mining and Manufacturing Company (3M) that the U.S. Nuclear Regulatory Commission (NRC) is authorizing release of land for unrestricted use at the 3M site in Kerrick, Minnesota.

3M performed dose assessments, in February 1998 and October 1999, to demonstrate that remediation at the site was not necessary, and that the calculated dose was below the limits in 10 CFR 20.1402 for unrestricted use of the site. NRC reviewed each dose assessment and found each inadequate.

In December 1999, NRC requested 3M to submit site-specific data that were found to have a significant impact on the time that the peak dose occurred. On May 31, 2000, 3M submitted these site-specific data. A conservative dose assessment, which incorporates these data, demonstrates that the unrestricted release criteria in 10 CFR 20.1402 are met. Based on NRC's review of the dose assessment, NRC concludes that the site is suitable for release for unrestricted use, and the site is being removed from the Site Decommissioning Management Plan.

The project manager for the 3M site is Kristina L. Banovac. If you have any questions on this matter, please contact her at (301) 415-5114.

Sincerely,

Larry W. Camper, Chief
Decommissioning Branch
Division of Waste Management
Office of Nuclear Material Safety and Safeguards

Docket Nos. 040-01020 and 070-00832
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