U. S. NUCLEAR REGULATORY COMMISSION
FINDING OF NO SIGNIFICANT IMPACT AND
NOTICE OF OPPORTUNITY FOR A HEARING
RENEWAL OF SOURCE MATERIAL LICENSE SMB-920
CABOT PERFORMANCE MATERIALS
BOYERTOWN, PENNSYLVANIA
DOCKET 40-6940

The U.S. Nuclear Regulatory Commission is considering the renewal of source Material License SMB-920 for the continued operation of Cabot Performance Materials (CPM) facility located in Boyertown, Pennsylvania. CPM processes tin slags, tantalite, and columbite ores to extract tantalum and niobium. The ores and slags contain uranium and thorium, and sludges resulting from the slag and ore processing contain in excess of 0.05 percent uranium and thorium. Therefore, the sludges are source material as defined and regulated by 10 CFR Part 40, and their possession by CPM is licensed by the Nuclear Regulatory Commission.

SUMMARY OF THE ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action

The proposed action is the renewal of CPM's source material license for five years. With this renewal, CPM will continue to operate the Boyertown facility to process tin slags, tantalite, and columbite ores, and will revise their process to use the stored sludges as supplemental feedstock in addition to new ores and ore concentrates. CPM is licensed to possess and use up to 400 tons of elemental uranium and thorium in slag, ores, and sludges.

Need for the Proposed Action

CPM performs a necessary service for the commercial electronics industry by extracting tantalum and niobium from slag and ores. Denial of the license renewal application is an alternative available to the NRC, but would require expansion of tantalum and niobium production capacity at an existing facility or transfer of extraction activities to a new facility. Denial of the application to process the sludges would result in their continued storage on site.

Effluent Controls and Monitoring

The continued operation of the CPM facility will result in the continued release of low levels of radioactive constituents and fluorides. Under accident conditions, the facility could release higher concentrations over a short period of time. The facility uses a number of controls to reduce the release of radioactive materials and fluorides to the environment, and performs monitoring of effluents and the environment.

The CPM facility produces gaseous, liquid, and solid effluent streams. Gaseous effluents are controlled by minimizing the amount of airborne radioactive materials within the plant, and by the use of a dust collector, baghouse, and stack scrubber on specific processes. Liquid effluents are controlled by the use of waste water retention lagoons and treatment systems that reduce the concentration of radioactive materials prior to discharge to West Swamp Creek. Solid wastes are managed through a combination of reprocessing, off-site disposal, and recycling.

Stack scrubber performance is monitored by measuring the concentration of fluorine in the scrubber water and the flowrate of the scrubber recycle water. The performance of the gaseous effluent controls is further evaluated by the environmental air sampling program described below. Liquid effluents are sampled at the point of discharge to Swamp Creek, and the samples are analyzed for uranium and other constituents. Solid wastes are surveyed prior to off-site disposal.

CPM has performed and will continue to perform monitoring to detect accumulation of radioactive materials in the environment. This environmental monitoring program samples sediment and surface water in West Swamp Creek; and air and ground water at locations on or near the facility. Forage sampling for fluoride, which was performed under the previous license, will not be performed under the renewed license.

Two new air monitoring stations downwind of the plant were installed in 1995. Air samples will be collected continuously at these two locations, and the samples analyzed for radioactivity. In addition, CPM has committed to perform a temporary air monitoring program using a mobile air sampler at additional

locations near the site boundaries. The purpose of this mobile sampling is to further assure that the most significant pathway for air effluents has been identified.

Environmental Consequences of Proposed License Renewal

Implementation of the proposed action, renewal of the CPM license, involves both beneficial and negative impacts. The beneficial impacts include support for production of economically valuable electrical components and processing of the stored sludge into a more stable form. The associated negative impacts from continued plant operations include releases to air and surface water from plant operation. Implementing either the proposed action or the alternative action, non-renewal of the license, involves decontamination and decommissioning (D&D) of the facility.

For the proposed action, the handling of materials and normal operations of the facility will result in the continued release of low levels of radioactive and non-radioactive constituents. Under accident conditions, the facility could release higher concentrations of materials over a short period of time. The facility will eventually be decontaminated and decommissioned at the end of its useful life, but the impacts of such decontamination and decommissioning are beyond the scope of this Environmental Assessment (EA), which deals only with the potential environmental impact of continued operations.

Normal operations at the CPM facility will involve groundwater withdrawals, discharges of fluoride and radionuclides to surface waters, discharges to the atmosphere, and generation of various solid and liquid waste streams. The impacts of normal operations are both radiological and nonradiological.

The radiological impacts of the continued operation of the CPM facility were assessed by calculating the radiation dose to the maximally exposed individual located at the nearest residence and the collective radiation dose to the local population living within 80 kilometers (50 miles) of the plant site.

The results of the dose assessments are summarized below, and a detailed description of the methodology and results is provided in the appendix to the EA.

Radionuclides which may be released to the environment include potassium-40 (K-40), uranium-238 (U-238), uranium-235 (U-235), thorium-232 (Th-232), and their decay daughters, including radon-222 (Rn-222). The sources of the releases are the main process building (Building 073) stacks, the ore storage pile, the sludge storage mausoleums, and the liquid waste system lagoons.

Potentially exposed individuals for the atmospheric releases are primarily residents along the northeast and north boundaries of the site. Atmospheric dispersion analysis established that the maximally exposed individual would be located on the northeast boundary of the site.

Liquid effluents are released into West Swamp Creek, a tributary of the Schuylkill River. Because of its low and irregular flow, West Swamp Creek is not a drinking water supply for area residents. Therefore, the analysis assumed that an individual along the Schuylkill River, and the surrounding population out to a distance of 80 kilometers (50 miles), used this potentially contaminated water.

The radionuclide doses were estimated using the Hanford Environmental Radiation Dosimetry Software System GENII computer code, except for radon. Atmospheric release exposure pathways included inhalation, ingestion of contaminated crops and resuspended dirt, and external exposure to the airborne plume and contaminated ground. Liquid release exposure pathways included ingestion of contaminated drinking water, fish, and irrigated crops; and external exposure during recreational activities. Because GENII does not simulate radon inhalation impacts, the NRC staff developed independent dose estimates using dose factors specific to radon-222. Details on the method of radiological impact analysis are presented in the appendix to the EA.

Potential radiation doses from releases to the atmosphere from the CPM facility are calculated for the maximally exposed individual and the

population. These doses are expressed in terms of the 50-year committed effective dose equivalent (CEDE) from internal exposure from the intake of radionuclides for a period of one year. For the maximally exposed individual, the CEDEs for combined releases from Building 073 and the ore storage pile were estimated as 6.5×10^{-7} Sv/yr (0.065 mrem/yr), while the CEDE for release from the storage mausoleums was estimated as 2.5×10^{-5} Sv/yr (2.5 mrem/yr). The doses are a small fraction of background doses for both the maximally exposed individual and other members of the population; the external background radiation doses from cosmic and terrestrial sources are approximately 2.6×10^{-4} and 2.8×10^{-4} Sv/yr (26 and 28 mrem/yr), respectively. The doses from atmospheric releases are also a fraction of the 10 mrem/year limit set by 40 CFR 61 Subpart I, National Emissions Standards for Radionuclide Emissions from Facilities Licensed by the Nuclear Regulatory Commission.

Potential impacts for the maximally exposed individual and the population from releases to surface water were also calculated. The largest tissue doses are to the bone surface from ingestion of lead-210 (Pb-210), and external doses are a factor of 10,000 smaller than internal doses. The CEDE for the maximally exposed individual was estimated as 2.8×10^{-6} Sv/yr (0.28 mrem/yr). For both the maximally exposed individual and other members of the population, doses are a small fraction of background sources.

The NRC regulations (10 CFR 20.1301) require that the Total Effective Dose Equivalent (TEDE) for members of the public not exceed 1.0×10^{-3} Sv (100 mrem) per year. The TEDE is the sum of the effective dose equivalent (EDE) from exposure to external radiation for one year and the CEDE defined above. For atmospheric releases of radionuclides other than radon, Environmental Protection Agency (EPA) regulations (40 CFR Part 61, Subpart I) require that the annual effective dose equivalent not exceed 1.0×10^{-4} Sv (10 mrem). Doses from CPM facility operations are dominated by releases to the atmosphere. For the maximally exposed individual, the annual TEDE including dose from radon was estimated as 2.6×10^{-5} Sv (2.6 mrem). The largest annual tissue dose was estimated as 2.1×10^{-4} Sv (21 mrem) to the lung. This tissue dose is entirely due to radon releases from the storage mausoleums, which

would be eliminated by implementing the planned sludge processing modifications. Estimated doses for all other releases are small fractions of applicable limits.

Continued operation of the facility is expected to have minor impacts on air quality, surface water, ground water, land use, and biota. Surface water, sediment, and groundwater monitoring during previous operations have indicated no significant impact from non-radiological constitutents, including fluoride. It is expected to have little or no impact on cultural resources, and to have a positive socioeconomic impact.

Normal operation of the CPM facility is not expected to have a significant effect on off-site nonradiological air quality, although fluoride concentrations measured in air have exceeded the State of Pennsylvania 24-hour maximum of 5 $\mu g/m^3$ on occasion. State-issued operating permits for processing activities include release limits for compounds of fluorides, and the State's compliance and enforcement program addresses any exceedence of the limits.

The primary potential impact on terrestrial resources is from fluoride released to the environment from the ore digestion process. Biannual monitoring of both corn and grasses since 1988 indicates that operation of the facility has resulted in elevated fluoride concentrations in forage crops growing adjacent to the plant.

There are no state or federal standards for fluoride concentration in forage. While there has been research in this area, as reported in the EA, no specific regulatory limits are currently applied to this aspect of the environment. Additionally, there are no federal ambient air quality standards for fluoride. There has been no increased degradation in off-site vegetation from fluoride since the previous assessment, and the expected releases will be the same as or less than those from previous operations. Therefore, no adverse impacts to the off-site environment are expected from the continued operation of the facility.

The handling, processing, and storage of material containing radioactive constituents at the CPM facility could result in uncontrolled release of radioactive material to the environment in the event of an accident. The

relatively small quantities and low concentrations of the radioactive constituents constrain the radiological impacts of potential accidents. Use of hazardous chemicals in operations at the facility could also result in uncontrolled releases, posing a potential risk to workers and public health and safety.

The accident analysis identified potential hazards, reviewed potential accident initiators and release mechanisms, developed accident scenarios, and estimated consequences for a set of potential accident scenarios. The hazard review identified the primary hazards as radionuclides in the feed material, process equipment, and sludge storage mausoleums, and the hazardous chemicals stored on site. For radioactive material in solid form, the primary release mechanisms would be drop and resuspension during transfer, and failure of the filtration systems during processing. For radioactive material in liquid solution, the primary release mechanism would be equipment failure during processing and transfer. For hazardous chemicals, the failure of storage equipment is the scenario with the largest potential impact. Based on the above considerations, a feed ore spill during transfer, a large-scale leak of treated liquid radioactive waste, and release of anhydrous ammonia from tank storage were selected as representative accidents.

Feed ore is transferred to process equipment from a storage pile located near building 073. Equipment failure or improper operation could lead to inadvertent dumping of the load, resulting in an airborne release of 0.066 and 0.009 μCi of U-238 and Th-232, respectively. Based on dispersion analysis, the maximally exposed individual would be 205 meters (673 feet) northeast of building 073, and the CEDE for this release was estimated as 4.0×10^{-7} Sv (0.04 mrem), indicating insignificant risk to public health and safety.

Approximately 30,280 liters (8,000 gallons) of liquid radioactive waste are processed daily at the CPM facility. Radionuclides are removed as filtered solids during processing, and the resulting liquid is mixed with other liquid streams to generate an overall average daily flow of approximately 378,500 liters (100,000 gallons). The largest capacity tank in the system is a 378,500-liter (100,000 gallon) tank for storing treated liquid. Failure of

this tank with release to surface water bounds potential accidents associated with the waste treatment system. The released liquid would be diluted in West Swamp Creek and the Schuylkill River, and the maximally exposed individual could receive a CEDE of 5.8×10^{-9} Sv (5.8×10^{-4} mrem). This dose is a very small fraction of normal background radiation, indicating insignificant risk to public health and safety.

Ammonia is stored under pressure as a liquified gas in a 37,850-liter (10,000 gallon) tank located on the southeast side of County Line Road. Failure of a transfer or relief line could cause an uncontrolled release with potential health and safety impacts. This event was represented as development of a 2.5-centimeter (1 inch) diameter hole in the tank vapor space, with isentropic escape through the hole. Under the assumed conditions, the release rate was estimated as 930 grams per second (2.05 pounds per second). The release time with no operator response could be as long as 6 hours. Dispersion analysis established that the maximally exposed individual would be located 330 meters (1,083 feet) north-northeast of the release point. Ambient ammonia concentrations were estimated as 1.3 grams per cubic meter (930 parts per million) at the location of the maximally exposed individual. Ammonia concentrations above 1,000 parts per million for an extended period of time can be lethal, while concentrations between 25 and 200 parts per million produce transient irritation. The potential for this release to occur for an extended period of time is low because CPM would take response actions in accordance with their Preparedness, Prevention, and Contingency Plan.

Alternative to the Proposed Action

An alternative to the proposed action is non-renewal of the license. In this case, CPM would shut down the processes that involve source material, and would decontaminate and decommission (D&D) the site in accordance with an approved plan. Cabot would do a thorough survey of the site grounds and buildings and prepare a detailed D&D Plan. The environmental impacts of the D&D activities would be assessed during NRC review of the detailed D&D Plan.

Agencies and Persons Consulted

During the preparation of the EA, various state and local agencies were contacted for gathering information. These contacts included the Tri-County Area Chamber of Commerce for employment information, the Pennsylvania Department of Conservation and Natural Resources for threatened and endangered species information, the Pennsylvania Department of Environmental Protection for air quality information, and the Pennsylvania Registry of Historic Places for cultural resources information.

Conclusion

The staff concludes that the impact to the environment and to human health and safety from operations at this facility has been and is expected to remain minimal. Results of the environmental monitoring program conducted during the previous license period indicate no significant impact to the environment as a result of site operations. Radioactive materials in effluents released to the environment are well below regulatory limits. The total whole body dose received by the maximally exposed individual is below federal regulatory limits.

FINDING OF NO SIGNIFICANT IMPACT

The NRC has prepared an EA related to the renewal of source Material License SMB-920. On the basis of this assessment, the NRC has concluded that environmental impacts that would be created by the proposed licensing action would not be significant and do not warrant the preparation of an Environmental Impact Statement. Accordingly, it has been determined that a finding of no significant impact is appropriate.

OPPORTUNITY FOR A HEARING

Any person whose interest may be affected by the renewal of this license may file a request for a hearing. Any request for hearing must be filed with the Office of the Secretary, U.S. Nuclear Regulatory Commission, Washington, D.C.

20555, within 30 days of the publication of this notice in the Federal Register; must be served on the NRC staff (Executive Director for Operations, One White Flint North, 11555 Rockville Pike, Rockville, MD 20852) and on the licensee (Cabot Performance Materials, County Line Road, Boyertown, PA 19512); and must comply with the requirements for requesting a hearing set forth in the Commission's regulation 10 CFR Part 2, Subpart L, "Informal Hearings Procedures for Adjudications in Materials Licensing Proceedings."

These requirements, which the requestor must address in detail, are:

1. The interest of the requestor in the proceeding;
2. How that interest may be affected by the results of the proceeding, including the reasons why the requestor should be permitted a hearing;
3. The requestor's area of concern about the licensing activity that is the subject matter of the proceeding; and
4. The circumstances establishing that the request for hearing is timely, that is, filed within 30 days of the date of this notice.

In addressing how the requestor's interest may be affected by the proceeding, the request should describe the nature of the requestor's right under the Atomic Energy Act of 1954, as amended, to be made a party to the proceeding; the nature and extent of the requestor's property, financial, or other (e.g., health, safety) interest in the proceeding; and the possible effect of any order that may be entered in the proceeding upon the requestor's interest.

Dated at Rockville, Maryland, this 25 day of September 1996.

FOR THE NUCLEAR REGULATORY COMMISSION
Original signed by:
Robert C. Pierson, Chief
Licensing Branch
Division of Fuel Cycle Safety
and Safeguards, NMSS

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*See previous concurrence

OFC	FCLB*	FCLB*	FCLB*	FCLB*	FCLB
NAME	MAdams:	PShea	MLamastra	MTokar	RPierson
DATE	9/05/96	9/05/96	9/13/96	9/20/96	9/25/96

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