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THE OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

SAFETY EVALUATION RELATED TO APPROVING THE PROJECT PLANS FOR REMEDIAL ACTION (PPRA)

AT THE ELKEM METALS COMPANY, MARIETTA, OHIO

FORMER LICENSE NO. SMB-933

1.0 BACKGROUND

The Elkem site, formally the Union Carbide Corporation (UCC) Metals Division plant, is located approximately 10 miles west of Marietta, Ohio, near the intersection of County Road 10 and State Highway 7. UCC previously processed tin slag at this facility for the production of tantalum and niobium metals. The slag feedstocks contained sufficient quantities of natural uranium and thorium such that licensing by the U.S. Nuclear Regulatory Commission (NRC) was required. During the early 1980s, UCC conducted remedial activities at the facility, and the NRC subsequently released the site for unrestricted use, and terminated the Material License (SMB-933) in 1985. About the same time, the facility was sold to Elkem Metals Company (Elkem).

In the spring of 1992, Elkem identified elevated radiation levels associated with the process equipment in Building 78. NRC and the Ohio Department of Health (ODH) conducted an independent survey that confirmed the presence of contamination. A radiological characterization of the Elkem facility and site was conducted by Chemical Waste Management, Inc. (CWMI), in April of 1992. The characterization confirmed licensable concentrations of natural thorium and elevated concentrations of natural uranium and decay products. Umetco Minerals Corporation (UMC), a subsidiary of UCC, also confirmed the presence of licensable concentrations of natural thorium and elevated concentrations of natural uranium and its decay products.

Building 78 is a one story steel/concrete structure containing approximately 6,000 square feet of floor space. The process equipment occupies approximately 800 square feet of floor space, and extends vertically from below grade to above the roof line. Approximately 90 percent of the contamination in Building 78 was found on the interior surfaces of the process equipment. The contamination on the interior of the process equipment consists of a dry granular to powdery material that is easily removed. The maximum surface area contamination levels are as follows: 2,880 dpm/100 cm^2 for total alpha: and 66,500 dpm/100 cm^2 for total beta-gamma.

Elevated soil contamination levels were identified at two relatively small areas north of Building 78. The contaminated areas are located outside and north of Building 78, between the first set of railroad tracks and the loading dock, and in the previous storage area located approximately 100 feet north of Building 78. The contaminated soil resulted from UCC's prior licensed activities. The estimated total volume of contaminated soil is 6 cubic yards, with a maximum concentration of 24 pCi/g.

2.0 DISCUSSION

2.1 Proposed Action

UCC has committed to remediate the Elkem site so that the site can be released for unrestricted use. UCC proposes to reduce the levels of contamination on the process equipment to acceptable levels, and to excavate and ship the contaminated soil to an authorized disposal site. The remediation actions at Elkem consist of vacuuming, and dismantling as necessary and to survey the remediated areas to ensure the contamination has been reduced to levels that permit unrestricted use of the equipment or to ensure that equipment with unacceptable levels of contamination has been or will be shipped to an authorized disposal site. The mill ventilation ducts, air movers, collector, storage bins, bucket elevator, chutes, hoppers, feeders, and some additional miscellaneous equipment will require partial dismantlement for remediation and for survey access. If necessary, wet-wiping and more aggressive methods to reduce the residual radioactivity will be evaluated.

In the area(s) where contaminated soil exists, prior to excavation, Elkem will identify and disable any underground utilities. The area(s) to be excavated will be identified using gamma scintillation. A small backhoe will be used to excavate the contaminated soil, guided by real-time gamma scintillation measurements. Water spray will be used to control dust, as required.

The staff has reviewed the proposed remediation methods for the contaminated process equipment, and the excavation and disposal method for the contaminated soil. The staff finds the proposed methods acceptable.

2.2 Schedule for Decommissioning

UMC estimates that dismantlement, remediation, and soil excavation will require approximately 6 months. The schedule for remediation is based on the following major activities: mobilization, remediation of the process equipment, excavation of the contaminated soil, and packaging and shipping of the soil and equipment that can not be adequately remediated to an authorized disposal site. Based on its review, the staff concludes that the schedule is reasonable.

2.3 Decommissioning Organization and Responsibilities

The key positions related to safe remediation of the site are: the Umetco Project Manager (UPM) and the Site Safety and Health Officer (SSHO). The UPM has overall responsibility for all remediation activities conducted on the site. UPM reports to both the UCC Program Manager and the UMC Manager of Engineering. The SSHO has responsibility for all onsite radiological health and safety activities. The SSHO reports to the UPM, and also has access to report health and safety concerns to higher management.

The staff concludes that UMC's proposed organizational structure is acceptable because it has identified the key personnel responsible for remediation, clearly defined the lines of authority to the corporate level, and demonstrates that the organization has the technical competence to conduct the required activities.

2.4 Training Program

UMC has committed to focus the training program on the inherent risks of exposure to radiation, and the fundamentals of protection against exposure to thorium, uranium, and their decay products. The staff concludes that UMC's training program is acceptable and meets the applicable provisions of 10 CFR 19.12 and applicable sections of 10 CFR Part 20.

2.5 Industrial Safety

The proposed remediation activities involve a number of routine industrial safety hazards that are subject to regulation by other Federal agencies. In these areas, the NRC staff has not reviewed the licensee's remediation plan for regulatory compliance, limiting the review to radiological aspects only.

2.6 Radiation Protection Program

The UMC radiation protection program to be used during remediation of the Elkem site will incorporate the requirements of the 1991 revision of 10 CFR Part 20. UMC will provide appropriate caution signs and labels in accordance with 10 CFR Part 20. In addition, the radiation protection program will implement administrative controls to control access of all project workers entering radiologically controlled areas, and establish work zones for transition between any restricted or controlled areas and unrestricted areas. The radiation protection program also defined the radiation monitoring devices to be used by all workers, i.e., thermoluminescent dosimeters (TLDs) and self-reading or digital alarming dosimeters. In addition, bioassay measurements will be made as necessary to access the intake of radioactive materials, in accordance with 10 CFR Part 20.

The radiation protection program also addresses environmental monitoring for airborne particulates. Monitoring locations will be located both upwind, and downwind in areas having the highest predicted airborne concentrations. UMC will investigate any air sample exceeding 1E-14 uC/ml, i.e., 50 percent of the allowable limit in 10 CFR Part 20, Appendix B, Table 2.

The primary responsibility for implementation of the radiation protection program is assigned to the SSHO. The SSHO will have direct communication with the UPM, and maintain overall responsibility for the radiation protection program. The UMC has also committed to train and qualify the SSHO in accordance with Sections 2.4 and 2.5 of Regulatory Guide 8.31, "Information Relevant to Ensuring that Occupational Exposure at Uranium Mills will be As Low As Reasonably Achievable." A detailed description of the radiation protection program is provided in Section 3.2, Part II of the PPRA. In addition, the administrative organization and functional responsibilities for implementation of the radiation protection program are described in detail in Section 2.0 of Part II of the PPRA.

The staff reviewed the UMC's radiation protection program and evaluated the tasks and activities that would be required to support remediation. The staff finds that the radiation protection program provides sufficient control of radioactive materials during remediation, and meets the requirements of 10 CFR Part 20.

2.7 Occupational Radiation Exposures

UMC has estimated that the total radiation exposures to personnel conducting remediation tasks will be less than one-quarter of the allowable 10 CFR 20.1201 limits. The staff finds that the estimated occupation exposure estimates are reasonable, based on the limited contamination at the site, the remediation tasks to be conducted, and the administrative controls UMC has committed to implement.

2.8 Radioactive Waste Disposal

UMC is proposing to remediate the process equipment, and does not anticipate having to ship the equipment to an authorized disposal facility. However, UCC has committed to ship any equipment that cannot be adequately remediated to an authorized disposal site. The solid radioactive waste will include the dusts and mineral solids removed from the equipment, and the contaminated soils excavated. The estimated total volume of soil requiring disposal is 6 cubic yards, and UCC has also committed to ship any additional contaminated soil discovered during remediation to an authorized disposal site.

Contaminated materials will be packaged and removed from the site as low specific activity (LSA) waste in accordance with 49 CFR 173.403. The material will be transported as exclusive use and packaged in accordance with 49 CFR 172.310 and 173.425(b) and 10 CFR Part 71. The staff finds the waste disposal methods acceptable.

2.9 Final Survey

UMC has developed a proposed final radiation survey to demonstrate the effectiveness of the remediation. UMC will provide documentation that will show that all necessary contaminated materials, structures, areas, and components have been successfully remediated to levels that would permit release of the site and equipment for unrestricted use.

UMC has committed to use the recommended criteria in the following documents:

1) U.S. Nuclear Regulatory Commission, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted use or Termination of Licenses for Byproduct or Source Material," August 1987;

2) U.S. Environmental Protection Agency, 40 CFR Part 192, "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings;"

3) Oak Ridge Associated Universities, NUREG/CR-5849, "Manual for Conducting Radiological Surveys in Support of License Termination," June, 1992; and

4) Federal Register Vol. 46, No. 205, 52061, "Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations," October, 1981.

Upon completion of the facility and soil remediation, UMC will implement its final survey based on the criteria provided in the references listed above. The NRC will perform an independent confirmatory survey to verify UMC's survey results.

The staff finds the survey methodology acceptable, based on UMC's commitment to follow the guidance provided in the references listed above.

3.0 ENVIRONMENTAL CONSIDERATIONS

The remediation activities at the Elkem site meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(11). Pursuant to 10 CFR 51.22(b), no environmental assessment need to be prepared in connection with the approval of this activity.

4.0 REGIONAL INTERACTIONS

Regional review of the Elkem PPRA was provided. The Region III staff reviewed the PPRA and provided comments.

5.0 FINDINGS

The NRC staff has concluded, based on the following considerations that: (1) there is reasonable assurance that the health and safety of the public and workers will not be endangered by operations described in UMC's PPRA; (2) the activities will be conducted in compliance with the Commission's regulations and guidance; (3) the remediation of the Elkem Metal facility will not be inimical to the common defense and security; and 4) the Elkem Metals Site can be safely remediated.

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