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# Site Decommissioning Management Plan

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**Division of Low-Level Waste Management and Decommissioning  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001**



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# NUCLEAR METALS, INC.

## 1. Site Identification

Nuclear Metals, Inc.  
Concord, MA

License Nos.: SMB-179, SUB-1452  
Docket Nos.: 040-00672, 040-08866  
License Status: Active  
Project Manager: M. Roberts, Region I  
LLWM Monitor: W. Lahs

## 2. Site and Operations

Nuclear Metals, Inc. (NMI) has manufactured products from depleted uranium (DU) for military, industrial, and medical applications since 1958. The licensee plans to continue operations at the site indefinitely.

The source of uranium in the area to be decommissioned at the NMI site was the discharge of neutralized pickling liquor (nitric acid) containing oxidized copper and depleted uranium (DU) to an unlined holding basin between 1958 and 1985. The discharge to the holding basin ceased when the licensee began using an acid recycling process in 1985. The basin was covered with a synthetic cover in 1986 to prevent water infiltration.

The facility consists of five major buildings and the holding basin on a 12-hectare (29.5-acre) site in the West Concord Industrial Park, Concord, Massachusetts. The area is partially wooded and includes a number of natural ponds and bogs. The adjacent lands to the east and south of the site are residential. The nearest residence is approximately 300 meters (981 feet) from the facility.

## 3. Radioactive Wastes

The holding basin contains about 2,750 m<sup>3</sup> (3,500 yd<sup>3</sup>) of material containing approximately 115,000 kg (250,000 pounds) DU and over 225,000 kg (500,000 pounds) non-radioactive copper.

Current manufacturing activities produce a steadily decreasing amount of radioactive waste per year for disposal at licensed disposal sites.

## 4. Description of Radiological Hazard

There is no immediate threat to the public health and safety. The holding basin is completely fenced and access is controlled through gates.

The licensee has had a contractor perform ground water monitoring since 1981. This monitoring program has documented the movement of non-radioactive nitrate compounds to a nearby stream, but has not given clear evidence of offsite migration of DU through the ground water. The semi-annual monitoring program includes sampling of the water supply used by the licensee, the licensee's discharges, ground water from more than 19 wells, and surface waters at about 24 locations on and off the NMI site. Soil and sediment samples also are collected and analyzed. The highest concentrations of DU measured have been in wells HB-7 and HB-8, which are located within a few feet of the holding basin. NMI believes these wells actually penetrate material discharged early in the use of the basin and, therefore, that the sampling results obtained from them do not indicate migration of uranium. DU concentrations in these wells peaked in 1983 at about 1,500 parts per billion (ppb), but have dropped and stabilized (at around 100 ppb) for the last four to five years. The contractor also has conducted various studies to determine the hydrogeology of the site.

In 1980 elevated levels of volatile organic compounds (VOCs) were measured in two wells. On the basis of an apparent ground water contamination with VOCs and presence of the unlined holding basin containing DU, the Commonwealth of Massachusetts, Department of Environmental Protection (DEP) classified Nuclear Metals as a "priority disposal site." This classification requires that DEP review and approve all remedial actions at the site. On the basis of corrective actions taken and current measurements, NMI believes that VOCs are no longer a problem. However, in accordance with commitments made as part of the Massachusetts

Contingency Plan Phase II comprehensive site assessment process, the licensee has installed several new monitoring wells and will perform additional soil and sediment sampling to more fully characterize the site.

In 1982 ORISE conducted an environmental survey at the site, and in 1985 EG&G conducted an aerial radiological survey over the site. The results of these surveys were in agreement with the results of the licensee's environmental and effluent monitoring programs. Offsite radiation measurements were in the background baseline range.

## 5. Financial Assurance/Viable Responsible Organization

NMI has stated that it is totally committed to complete remediation and decommissioning of the holding basin and its contents. It has provided an irrevocable letter of credit for \$750,000 as decommissioning funding. The licenses require submission of a decommissioning funding plan, including an actual cost estimate, on or before July 1, 1993.

## 6. Status of Decommissioning Activities

Since 1985, when the holding basin was closed, the licensee has been working to develop a plan to decommission the holding basin and remove its contents. This activity has resulted in periodic discussions between the NRC, the Commonwealth of Massachusetts, the Concord Board of Health, and NMI.

Presently, NMI is exploring two options for treatment of the holding basin: (1) recycling the material in the basin for resource recovery (a pilot project to determine economic feasibility of recycling is in progress, this included sampling of the contents of the basin) or (2) sending the basin contents to a licensed burial site for disposal.

The licensee submitted a brief description of a decommissioning plan as part of its request to renew the license in 1989. In December 1991 the licensee met with NRC to discuss a tentative removal and disposal plan it is developing. Implementation of this plan, which involves recovery and recycling of the copper and uranium, is dependent on the acceptability of the plan by a number of regulatory groups. NRC staff met with the licensee and representatives of the Commonwealth of Massachusetts several times in 1992 to negotiate a schedule for submission of a site characterization report and a decommissioning plan. These discussions are continuing. On October 20, 1992, NMI submitted a draft outline for the holding basin site characterization report. The site characterization report was submitted February 12, 1993.

## 7. Other Involved Parties

A factor in the process is that the Massachusetts DEP has classified NMI as a "priority disposal site." The licensee states that this requires that a detailed process must be followed for developing the decommissioning plan and that DEP must approve all remedial actions at the site.

There is significant interest in the site by local citizens and the Concord Board of Health.

## 8. NRC Actions and Schedule

- NRC meets with NMI to discuss schedule for submittal of decommissioning plan May 1993
- NRC reviews holding basin characterization report and requests additional information September 1993
- NMI submits revised characterization report October 1993
- NRC approves characterization report December 1993
- NMI submits decommissioning plan and schedule June 1994
- NRC reviews decommissioning plan and schedule requests additional information September 1994
- NRC approves plan and schedule December 1994

## 9. Problems/Issues

- NMI continues to explore options for treatment of the contents of the holding basin. NMI indicates that to make reprocessing and recycling of material in holding basin economically viable, it must be accomplished over an extended time (5 to 7 years).
- Massachusetts DEP has classified NMI as a "priority disposal site." NRC has been in communication with DEP and does not anticipate significant delays caused by DEP; however, NMI believes this process will significantly increase the time necessary to complete the project.
- The copper claimed by reprocessing may be slightly contaminated, raising the issue of recycling.