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Environmental Assessment and Finding of No Significant Impact for the General Services Administration Watertown, Massachusetts Property

The U.S. Nuclear Regulatory Commission (NRC) is authorizing the release of the General Services Administration (GSA) property in Watertown, MA, for unrestricted use, and has prepared an Environmental Assessment (EA), resulting in a Finding of No Significant Impact (FONSI), in support of this decision.

SUMMARY

NRC reviewed the results of the decommissioning of the GSA facility in Watertown, MA. The site was a parcel of the former Watertown Arsenal which the U.S. Army used for depleted uranium (DU) munition operations authorized under Atomic Energy Commission (AEC) License No. SUB-238. From 1955-1966, an area northeast of the Arsenal site (now identified as the GSA property) was designated for stabilization of DU scrap from Arsenal activities.

The U.S. Army Corps of Engineers, New England District, (USACE) currently manages the property for the GSA. The USACE proposed unrestricted site release without further remediation. The proposal is based on an examination of radiological data from previous site surveys. A site-specific dose analysis was conducted using RESRAD version 6.0 dose-modeling software. Based on the measured concentrations of total uranium remaining at the GSA site, and the physical characteristics of depleted uranium, the USACE has demonstrated that the facility meets the license termination criteria in Subpart E of 10 CFR Part 20, (the License Termination Rule, or LTR). The annual total effective dose equivalent to the average member of the critical group is significantly less than 0.25 millisieverts per year (mSv/yr) (25 millirem per yr (25 mrem/yr)), and the dose is as low as is reasonably achievable. The NRC staff has evaluated the USACE's request and the results of the surveys, and has developed this EA in accordance with the requirements of 10 CFR Part 51. Based on the staff's evaluation, the conclusion of the EA is that the proposed action will not have a significant impact on human health and the environment, and, with respect to residual radioactivity, the site is acceptable for unrestricted release.

INTRODUCTION

The GSA property is located in Watertown, Middlesex County, MA, approximately 13 kilometers (eight miles) west of Boston. It was a parcel of the former Watertown Arsenal used by the U.S. Army for DU munition operations authorized under AEC License No. SUB-238. From 1955-1966, an area northeast of the Arsenal site (now identified as the GSA property) was designated for stabilization of DU scrap from Arsenal activities. Operations involved igniting DU fragments at a specific site location ("burn pit") to reduce volume, packaging the material in waste containers, and preparing shipments for offsite disposal. Contamination of soil resulted from spillage of the DU fragments and burned material during transport to and from the burn staging area.

In 1968, the parcel of property was transferred conditionally to the GSA, with the stipulation that the Army would remain responsible for site remediation of radiological contamination. In 1973, the Army performed site cleanup of outdoor concrete surfaces to AEC unrestricted use guidelines in effect at that time, then conducted the final radiation survey. Those standards were 10,000 disintegrations per minute per 100 square centimeters-alpha (dpm-alpha/100 cm^2) (total) and 1000 dpm-alpha/100cm^2 (removable) ("Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licensing for Byproduct, Source, or Special Nuclear Materials," April 22, 1970). Based on results of the survey, the AEC determined that the property was suitable for release for unrestricted use in January 1974. The GSA has maintained control of the site, keeping it fenced and locked.

In 1981, under the U.S. Department of Energy Formerly Utilized Site Remedial Action Program, Argonne National Laboratory (ANL) performed a review of previous site decontamination efforts, and found that file documentation that led to release of the property for unrestricted use was insufficient. ANL conducted a follow-up radiological survey of the property that identified residual contamination in soil at the GSA site which exceeded the concentration-based guidelines published in the October 1981, Branch Technical Position ("Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations," 46 FR 52601, October 23, 1981). Additional chemical and radiological characterization surveys were conducted by Chem-Nuclear Systems Inc. (CNSI) (CNSI, 1988) and Morrison-Knudsen and Scientific Ecology Group, Inc. (MK/SEG) (MK/SEG, 1996). Those surveys also confirmed DU, in soil, that exceeded the guideline limit (1.3 Becquerels per gram (Bq/gm) (35 picocuries per gram (pCi/g)) of the Branch Technical Position.

When NRC developed the Site Decommissioning Management Plan (SDMP), this site, although unlicensed, was placed on the list because of the levels of residual contamination found, during the ANL survey, which remained on the property. The site was also listed under the Massachusetts Contingency Plan (MCP) because of the presence of detectable quantities of residual hazardous materials, including chemicals, heavy metals, and DU. Highest concentrations of DU in surface and subsurface soil were found in the area where uranium wastes were burned. Remediation efforts at the site have included a site-wide excavation by the Army in 1967, and remediations of the burn pit area after the 1981, 1988, and 1996 surveys. As a result of these efforts, large amounts of DU-contaminated soil were removed and disposed of.

PURPOSE AND NEED FOR PROPOSED ACTION

The proposed action is to release the GSA site in Watertown, MA, for unrestricted use, and remove it from the SDMP. Under this proposed action, no further remediation will be needed and radiological controls will not be maintained.

The USACE, New England District, currently manages the GSA property. The USACE has requested unrestricted site release without further remediation, based on an examination of radiological data documented in the ANL, CNSI, and MK/SEG survey reports. The information was consolidated and presented in the report entitled, "Evaluation of the Final Radiological Status (EFRS) of the Watertown GSA Site," (Harding ESE, USACE contractor), dated April 2003. The USACE submitted the EFRS as the final radiological survey report, supported by statistical analysis of data reliability.

EVALUATION OF DERIVED CONCENTRATION GUIDELINE LEVELS

The development of Derived Concentration Guideline Levels (DCGLs) for a specific site starts by identifying appropriate public health limits and standards. Environmental transport and dose modeling is then used to derive allowable residual concentrations of radionuclides, or DCGLs, that will meet those standards, considering a range of potential land uses. The following paragraphs describe how those DCGLs were established for the GSA Watertown site.

The USACE submitted DCGLs for DU in the soil to satisfy the NRC's LTR dose criterion for unrestricted release in September 2001 (Final Derived Concentration Guideline Level Report). The USACE also considered Commonwealth of Massachusetts' criteria applicable to the site because of a contingency in the deed which would have the site revert to the Commonwealth at a future date (Note that this contingency is not a deed restriction, and was not used in the selection of the future land use scenarios). These criteria include the Massachusetts Department of Environmental Protection (MADEP) human health risk criterion of excess cancer risk of $< 1 \times 10^{-5}$, as well as the Massachusetts Department of Public Health (MADPH) dose-based radiation standard of 0.1 mSv/yr (10 mrem/year). Of the three release criteria -- MADEP's excess lifetime cancer risk of $< 1 \times 10^{-5}$, MADPH's radiation standard of 0.1 mSv/yr (10 mrem/y), and NRC's 0.25 mSv/yr (25 mrem/yr) dose criterion in 10 CFR 20.1402 -- the MADEP risk criterion proved to be the most restrictive.

To establish a suite of credible future land-use scenarios, a panel of government officials and local stakeholders was convened. This panel included representatives of USACE, the Army Research Laboratory, GSA, MADPH, MADEP, the Massachusetts Metropolitan District Commission (MAMDC) as the local township development authority, and the town of Watertown. The panel concluded that the most credible future uses for the site fall within the broad categories of public or recreational use. More specifically, the panel concluded that, within these broad categories, the following scenarios should be considered: construction worker, occupational worker, recreational facility user, and community gardener. The panel considered other scenarios, such as full-time residency or exclusive use of the site for farming, to be either not consistent with the location of the property in a high population density area, or with the future development plans of the MAMDC and the municipality of Watertown.

The USACE used the probabilistic RESRAD dose modeling code, version 6.0, to generate DCGLs for each of these scenarios. External dose was the controlling pathway for all of the scenarios. The calculated DCGLs for total uranium for the various public and recreational scenarios ranged from 12.6 Bq/g (340 pCi/g) to 192 Bq/g (5175 pCi/g). The USACE proposed the most restrictive DCGL of 12.6 Bq/g (340 pCi/g) as the cleanup criterion for the site.

NRC staff reviewed the scenarios presented by the USACE, and the resulting DCGLs. Given the uncertainties about future land uses for the site, particularly as they relate to future residential use, NRC required the USACE to assess an alternate scenario, to understand the robustness of the analysis. Specifically, an "urban resident" scenario was evaluated to assure that the proposed DCGLs would satisfy the NRC LTR dose criterion over a full range of potential land uses. Using the NRC dose criterion of 0.25 mSv/yr (25 mrem/yr), this urban resident scenario resulted in a DCGL of 37.5 Bq/g (1010 pCi/g).

Because the DCGL proposed by the USACE was more restrictive than the DCGL to satisfy the NRC criterion for unrestricted release of the site, and after coordination with MADEP and MADPH, NRC approved the use of a DCGL of 12.6 Bq/g (340 pCi/g) in a letter dated May 10, 2001.

DCGL Summary and Conclusion

The staff has reviewed the dose modeling analyses for the GSA Watertown site using Chapter 5.2 of NUREG-1727, "NMSS Decommissioning Standard Review Plan." The NRC staff agrees that a DCGL of 12.6 Bq/g (340 pCi/g) total uranium (based on the assumptions on the isotopic ratio of the depleted uranium) is conservative for the site, considering reasonable scenarios of future land use and that it provides reasonable assurance that the dose to a member of the public is not likely to exceed the 0.25 mSv (25 mrem) annual dose criterion in 10 CFR 20.1402. This conclusion is based on the modeling effort performed by the USACE and the independent analyses performed by the NRC staff.

CONFIRMATORY MEASUREMENTS

The USACE sample results reported after the final excavation and survey (MK/SEG) showed maximum soil concentrations throughout the site were below the approved DCGL, with low concentrations of residual DU-contaminated soil remaining on or near the surface. Detectable total uranium concentrations from groundwater samples were at or near background levels.

NRC staff conducted a confirmatory radiological survey at the site in May 2003. The survey included exterior area scans and direct measurements, followed by measurements of DU concentrations in soil and groundwater. A total of 26 soil samples were taken, concentrated in the area of greatest concern (i.e., the burn pit area). Five groundwater samples were also taken, both up gradient and down gradient of the burn pit. Selected soil and water samples were split for analysis with the MADPH. Results of NRC measurements found no contamination in groundwater and confirmed that all samples taken throughout the site showed residual soil contamination significantly below the approved DCGL. Sample results in the burn pit area ranged from 0.2 to 1.6 Bq/g (5 to 43 pCi/g), total uranium (1 to 12 percent of the DCGL), while results of samples taken throughout the site outside the burn area were less than 1 percent of the DCGL. MADPH sample analysis agreed with the NRC analysis. From isotopic analyses of soil and groundwater samples taken during NRC confirmatory measurements, the NRC staff determined that the radiological material remaining at the GSA site is below the approved DCGL.

ALTERNATIVE TO THE PROPOSED ACTION

The NRC considered the no-action alternative to the proposed action. The alternative would not release the GSA property for unrestricted use, and would leave the GSA property on the SDMP list. Since the site is not currently licensed by the NRC, and the site satisfies the NRC criteria for release for unrestricted use, this is not a reasonable alternative to the proposed action.

THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

The NRC staff has reviewed the final survey report the USACE developed to demonstrate compliance with the 10 CFR 20.1402 license termination criteria. Based on its review, the staff has identified no significant environmental impacts resulting from the proposed action. The action, which is primarily administrative in nature, will release the GSA property for unrestricted use. As a result, approximately 4.9 hectares (12 acres) of land will be available for future use. Accordingly, the staff has determined that the affected environment and environmental impacts associated with the release for unrestricted use of the GSA Watertown property are bounded by the impacts evaluated by the "Generic Environmental Impact Statement in Support of Rulemaking on Radiological Criteria for License Termination of NRC-Licensed Nuclear Facilities" (NUREG-1496). The staff also finds that the release for unrestricted use of the GSA Watertown property is in compliance with 10 CFR 20.1402, "Radiological Criteria for Unrestricted Use."

MITIGATION AND MONITORING MEASURES

The result of this action will be to release the site without restrictions on future site use, therefore no mitigation nor monitoring measures are warranted.

AGENCIES AND PERSONS CONSULTED AND SOURCES USED

This Environmental Assessment was prepared entirely by the NRC staff. NRC staff coordinated the radiological assessment with MADPH and MADEP staff. MADPH and MADEP separately performed reviews, and both agencies agreed with the USACE proposed land-use scenarios. For residual radionuclides remaining on the site, the Commonwealth follows different release requirements for unrestricted use. The USACE's dose assessment proposal correlates with the Commonwealth's requirements. The MADPH uses a dose-based radiation standard 0.1 Bq/yr (10 mrem/yr) which is more restrictive than NRC's standard. MADEP, as administrator of the MCP, determined that the human health risk criteria of the MCP should be applied. The NRC staff assessment in view of the Commonwealth requirements determined USACE's dose modeling completed for the proposed action was conservative and appropriate. The staff also provided the Commonwealth with an opportunity to review this EA.

The U.S. Fish and Wildlife Service (FWS) was contacted to ensure that release of the GSA Watertown property for unrestricted use will not have an adverse impact on threatened or endangered species. The FWS informed NRC on June 25, 2003, that the proposed action will have no impact on threatened or endangered species. No other sources were used beyond those referenced in this EA.

CONCLUSION AND FINDING OF NO SIGNIFICANT IMPACT

Based on its review, the NRC staff has concluded that the action--a decision to release the GSA, Watertown property for unrestricted use-- complies with 10 CFR Part 20. In accordance with 10 CFR 51.30, NRC has prepared this EA to support its decision on this site. The staff has reviewed the "Evaluation of the Final Radiological Status of the Watertown GSA Site" report and concludes that, with respect to residual radioactivity, the site meets NRC's requirements for release for unrestricted use. Release of this site will not have a significant impact on the environment. On the basis of the EA, NRC has concluded that the environmental impacts from

the decision are expected to be insignificant, and thus has determined not to prepare an environmental impact statement for the proposed action.

LIST OF PREPARERS

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LIST OF REFERENCES

1. NRC Docket No. 040-02253 inspection and licensing records.

2. "Evaluation of the Final Radiological Status of the Watertown GSA Site," April 2003 ADAMS Accession No. ML031220319

3. "Historical Site Assessment, GSA Property," October 2000. ADAMS Accession No. ML003726993

4. "Comprehensive Site Assessment and Focused Uranium Tailings Investigation, GSA Property," August 2002. ADAMS Accession No. 023610571

5. "Final Derived Concentration Guideline Report, GSA Property," September 2001. ADAMS Accession No. ML 010730064

6. Federal Register Notice, Volume 65, No. 114, page 37186, dated Tuesday, June 13, 2000, "Use of Screening Values to Demonstrate Compliance with the Federal Rule on Radiological Criteria for License Termination."

7. USNRC "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licensing for Byproduct, Source, or Special Nuclear Materials," April 22, 1970."

8. USNRC "Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operation," 46 FR 52001, October 23, 1981.

9. Title 10 Code of Federal Regulations, Part 20, Subpart E, "Radiological Criteria for License Termination."

10. Title 10, Code of Federal Regulations, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."