



UNITED STATES  
**NUCLEAR REGULATORY COMMISSION**  
REGION IV  
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ARLINGTON, TEXAS 76011-4005

April 18, 2006

MEMORANDUM TO: Jack E. Whitten, Chief  
Nuclear Materials Licensing Branch  
Division of Nuclear Material Safety

FROM: D. Blair Spitzberg, Chief */RA/*  
Fuel Cycle & Decommissioning Branch  
Division of Nuclear Material Safety

SUBJECT: SAFETY EVALUATION REPORT FOR U.S. ENVIRONMENTAL  
PROTECTION AGENCY - DENVER FEDERAL CENTER

Enclosed is the Safety Evaluation Report for U.S. Environmental Protection Agency (EPA) - Denver Federal Center, Materials License No. 05-14892-01. By letter dated August 9, 2004, the EPA requested a license amendment to remove Building 53, as a location of use, for unrestricted use in accordance with 10 CFR 20.1402. Enclosed to the licensee's letter was a final status survey report dated June 2004.

The enclosed Safety Evaluation Report is FCDB staff's evaluation of the radiological consequences of the proposed licensing action. This Safety Evaluation Report was prepared using the guidance provided in NUREG-1757, Volume 1, Revision 1, Appendix G, "Template for a Safety Evaluation Report."

The facility meets the criteria of a Group 2 decommissioning site. Group 2 refers to a site that is not required to submit a decommissioning plan and uses the NRC's screening criteria to demonstrate compliance with 10 CFR Part 20, Subpart E requirements. Table 1.2 of NUREG-1757, Volume 1, provides the principle regulatory features of the seven decommissioning groups. Provided below is a status of each of the principle regulatory features for a Group 2 project:

Principle Regulatory Feature	Status
NEPA Compliance - completion of an Environmental Assessment	EA & FONSI were published in the Federal Register on April 18, 2006 (71 FR 19907)
Restricted or Unrestricted Use	Licensee requested unrestricted use
DP Required - Yes or No	No
DP Review Documentation	Not Applicable

Radioactive Material Disposition Documentation	All radioactive material was transferred to another building at the Denver Federal Center campus
Method for Demonstrating Site is Suitable for Release - Survey or Demonstration	Final status survey report was submitted by letter dated August 9, 2004
Confirmatory or Side-by-Side Survey	A confirmatory survey was conducted in October 2005 (Report 030-08219/05-001)
Closeout Inspection	Final inspection of Building 53 conducted in conjunction with the October 2005 confirmatory survey
FRN Used to Inform the Public of Staff Actions	FONSI announcement, with no opportunity for hearing, is the only publicly required notification per NUREG-1757
Documentation Used to Support License Termination	License is not being terminated; amend license to remove Bldg 53 from License Condition 10

The NRC staff considered whether a consultation with EPA is required per the EPA-NRC Memorandum of Understanding dated October 9, 2002. An EPA consultation was not required because the contamination was limited to internal building surfaces only; there was no groundwater or outdoor soil contamination resulting from previous licensed operations.

In summary, the review of the final status survey report is complete. The results of the final survey meet the criteria of NUREG-1757 and similar guidance documents; therefore, FCDB approves the final status survey report. Please issue a license amendment to License No. 05-14892-01 authorizing the removal of Building 53 from License Condition 10 for unrestricted use as requested by the licensee in its August 9, 2004, letter.

Docket No.: 030-08219  
License No.: 05-14892-01  
Control No.: 470094

Enclosure: Safety Evaluation Report

bcc w/enclosure (via ADAMS e-mail distribution):

LDWert

CLCain

DBSpitzberg

JEWhitten

RSBrowder

BASchlapper

RJEvans

RIV Nuclear Materials File - 5<sup>th</sup> Floor

SUNSI Review Completed: RJE ADAMS:  Yes  No Initials: RJE

Publicly Available  Non-Publicly Available  Sensitive  Non-Sensitive

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# **SAFETY EVALUATION REPORT**

## **U.S. ENVIRONMENTAL PROTECTION AGENCY, DENVER FEDERAL CENTER**

### **1.0 Executive Summary**

By letter dated August 9, 2004, the U.S. Environmental Protection Agency (EPA) requested amendment of Materials License No. 05-14892-01 to remove Building 53 as a location of use. This Safety Evaluation Report is the NRC staff's evaluation of the radiological consequences of the proposed request. Based on the results of this evaluation, NRC staff recommends approval of the licensee's request to release Building 53 for unrestricted use and to remove the building from License Condition 10.

### **2.0 Facility Operating History**

#### **2.1 License Number/Status/Authorized Activities**

Materials License No. 05-14892-01 authorizes EPA to possess small quantities of radioactive material, in both sealed and unsealed form, for instrument calibration and sample analysis. Condition 10 states that licensed material may be used only in Buildings 25 and 53 at the Denver Federal Center, Denver, Colorado.

#### **2.2 License History**

Radioactive material was used by EPA at Building 53 from 1973-2003. The licensee conducted a historical review and concluded that the radionuclides of concern included americium-241, strontium-90, natural uranium, radium-226, and radium-228. All radioactive materials were relocated to Building 25 by August 2003.

At the time of the October 17-19, 2005, confirmatory survey (NRC Inspection Report 030-08219/05-001), the EPA's former offices in Building 53 were vacant. Most furniture, equipment, sinks, countertops and fixtures had been removed. A property custodian speculated that this wing of the building may be demolished in the near future.

#### **2.3 Previous Decommissioning Activities**

By early 2004, ventilation hoods, sinks and furniture had been radiologically surveyed and free-released by the licensee. A final status survey of the building was conducted during February-March 2004. A Final Status Survey Report (FSSR) was completed by the licensee, and a copy of the FSSR was attached to the licensee's August 9, 2004 letter. Based on the final status survey results, no decommissioning was necessary.

#### **2.4 Spills**

In the FSSR, the licensee states that no incidents involving spills or releases of radioactive material occurred during the 30-year operational history of Building 53. A review of the docket file was conducted by the NRC staff, and no record of a spill or other radiological incident was identified in the file.

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## 2.5 Prior Onsite Burials

There is no evidence that the licensee buried radioactive material at the facility.

## 3.0 Facility Description

### 3.1 Site Location and Description

Building 53 is located in the Denver Federal Center, Denver, Colorado. The building consisted of both laboratories and administrative offices. The licensee's historical review determined that radioactive material had been used or stored in eight rooms. Only sealed sources were used or stored in two of the eight rooms. There was no evidence that any sealed source leaked; therefore, these two rooms were excluded from the final survey. A third room was excluded because the radioactivity of the material possessed in this location did not exceed background levels.

### 3.2 Population Distribution

The building is located in a security controlled office complex. Other office buildings are located adjacent to Building 53. There are no homes in the immediate vicinity of the property. The area is only populated during normal business hours.

### 3.3 Current/Future Land Use

The licensee plans to return the property to the General Services Administration following NRC approval of the free release. The General Services Administration is considering the demolition of the property, although the building may be reused as office space. The Denver Federal Center will continue to be an office complex for the foreseeable future.

### 3.4 Meteorology and Climatology

A review of the meteorology and climatology for the Denver Federal Center is not necessary because all licensed operations occurred inside of Building 53.

### 3.5 Geology and Seismology

A review of the geology and seismology for the Denver Federal Center is not necessary because all licensed operations occurred inside of Building 53.

### 3.6 Surface Water and Groundwater Hydrology

A review of the surface water and groundwater hydrology for the Denver Federal Center is not necessary because all licensed operations occurred inside of Building 53.

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### 3.7 Natural Resources

A review of the natural resources for the Denver Federal Center is not necessary because all licensed operations occurred inside of Building 53.

### 3.8 Ecology/Endangered Species

A consultation with the U.S. Fish and Wildlife Service was not conducted because all licensed operations occurred inside of Building 53. There were no incidents or spills that resulted in the release of radioactive material to the environs of the building.

## 4.0 Radiological Status of Facility

### 4.1 Contaminated Structures

Historically, only environmental-level radiochemical screenings and measurements were performed in Building 53, with few exceptions. As part of the final status survey, surface sampling was conducted on equipment, fixtures, floors, and walls. All sample points were found to be less than the licensee's proposed release criteria. No contaminated structures were identified during the final status survey.

### 4.2 Contaminated Systems and Equipment

There were no contaminated systems or equipment in Building 53 at the time of the final status survey. Radiological surveys were performed on equipment and fixtures. All items surveyed met the release criteria established by the licensee. The material was subsequently disposed or recycled as appropriate.

### 4.3 Surface and Subsurface Soil Contamination

Since licensed material was used only within Building 53 and there were no spills or releases, no surface or subsurface soil contamination could have occurred outside of Building 53.

### 4.4 Surface Water and Groundwater

Since licensed material was used only within Building 53 and since there were no documented releases of radioactive material to the sewer, no surface or groundwater contamination could have occurred.

## 5.0 Dose Modeling Evaluations

### 5.1 Unrestricted Release using Screening Criteria

Section 2.5 of NUREG-1757, Volume 2, "Consolidated NMSS Decommissioning Guidance," provides two general approaches for demonstrating compliance with

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10 CFR Part 20, Subpart E dose criteria. The two major approaches include the dose modeling approach or the FSSR and derived concentration guideline levels (DCGLs) approach. The licensee chose to use the second approach by submittal of an FSSR with proposed DCGLs.

By NRC letter dated October 27, 2003, EPA was informed that Building 53 would remain on the license until EPA submitted a FSSR to the NRC. The NRC also stated that EPA should use the guidance provided in the NRC's "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material" dated August 1987 and the Simplified Procedure for Certain Users of Sealed Sources, Short Half-Life Materials, and Small Quantities provided in Appendix B to NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)."

By letter dated August 9, 2004, EPA submitted a FSSR to the NRC for Building 53. The licensee elected to use the surface contamination limits provided in Table 1, "Acceptable Surface Contamination Levels," provided in the NRC's August 1987 guidance document as the proposed DCGLs for free-release of Building 53. Since multiple radionuclides were used at the facility, the licensee conservatively chose to use strontium-90 as the surrogate beta emitting radionuclide and americium-241 as the surrogate alpha emitting radionuclide.

The proposed beta activity DCGLs are 1000 dpm/100 cm<sup>2</sup> average, 3000 dpm/100 cm<sup>2</sup> maximum, and 200 dpm/100 cm<sup>2</sup> removable surface contamination. Similarly, the proposed alpha activity DCGLs are 100 dpm/100 cm<sup>2</sup> average, 300 dpm/100 cm<sup>2</sup> maximum, and 20 dpm/100 cm<sup>2</sup> removable surface contamination. Any measurement location with both alpha and beta radiation would be evaluated using the unity rule. The licensee also developed action levels, equal to or less than the above DCGLs, for use during performance of the final status survey. Comparison of the proposed DCGLs to the final and confirmatory sample results is provided in Section 12.3 of this Safety Evaluation Report.

## 5.2 Unrestricted Release using Site-Specific Information

The licensee did not request a building release using site-specific information as allowed by NUREG-1757.

## 5.3 Restricted Release using Site-Specific Information

The licensee did not request a restricted release of the building as allowed by 10 CFR 20.1403.

## 5.4 Release Involving Alternate Criteria

The licensee did not request a building release using alternate criteria as allowed by 10 CFR 20.1404.

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## **6.0 Decommissioning Activities**

### **6.1 Contaminated Structures**

Contaminated structures were not identified during the final status survey. All floors and walls were surveyed by the licensee, and none of the surfaces exceeded the respective DCGLs.

### **6.2 Contaminated Systems and Equipment**

Contaminated systems and equipment were not identified during the final status survey. Equipment and fixtures were surveyed by the licensee, and none of these items exceeded the respective DCGLs.

### **6.3 Soil**

Since the soil was not impacted by previous operations involving radioactive material in Building 53, the site soil was not remediated or sampled.

### **6.4 Surface and Groundwater**

Since the surface and groundwater were not impacted by previous operations involving radioactive material, the surface and groundwater sources were not sampled.

### **6.5 Schedules**

The radioactive material was removed from Building 53 during 2003. The final status survey was conducted during February-March 2004, and the FSSR was completed in June 2004. The FSSR was submitted to the NRC for review and approval during August 2004. A confirmatory survey was conducted during October 2005. Additional radiological surveys are not anticipated.

## **7.0 Project Management and Organization**

Details of the licensee's proposed organization are provided in the FSSR. The methods and techniques employed during the final status survey, including responsibilities, were provided in Appendix C, Field Protocol. The work was conducted by a contractor under the oversight of the EPA's radiation safety officer. The laboratory protocols were provided in Appendix D to the FSSR. The NRC staff concluded that the project management and organization were acceptable based on the scope of work.

## **8.0 Radiation Safety and Health Program**

The FSSR discusses radiation safety and health program attributes; although, the workers were also required to adhere to the conditions of the EPA's radiation protection

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program. The EPA's radiation safety program is reviewed as part of the NRC's routine licensing and inspection program.

The NRC confirmed that the instrumentation used to measure the radioactivity was appropriate for the type of radiation present. The licensee also provided detailed records of instrument calibrations and functional tests.

## **9.0 Environmental Monitoring Program**

This program attribute was not reviewed because the work was conducted entirely within Building 53.

## **10.0 Radioactive Waste Management Program**

This program attribute was not reviewed. The remaining radioactive materials were transferred from Building 53 to Building 25 during 2003. Any residual wastes generated from licensed activities and removed from Building 53 will be stored or disposed as stipulated by the EPA's active license. The EPA's control of radioactive wastes is reviewed as part of the routine NRC inspection program.

## **11.0 Quality Assurance Program**

Quality assurance requirements are provided in Appendix B to the FSSR. Quality assurance controls included split and replicate sampling.

## **12.0 Facility Radiation Surveys**

### **12.1 Release Criteria**

Discussion of the release criteria is provided in Section 5.1 of this Safety Evaluation Report.

### **12.2 Characterization and Remedial Action Support Surveys**

This program area was not reviewed. The NRC staff concentrated on the final status survey results presented in the FSSR.

### **12.3 Final Status Survey Design/Report**

The NRC staff compared the guidance provided in MARSSIM to the design of the final status survey. The survey consisted of two major portions, survey of equipment and survey of building surfaces. Direct, fixed-point measurements and swipe samples were collected on equipment and fixtures in each room. The survey results for the equipment and fixtures met the release criteria, and the licensee free-released the materials for disposal or recycling.

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When designing and conducting the final status survey of the building surfaces, the licensee used the simplified procedures provided in Appendix B to MARSSIM as recommended by the NRC in its letter dated October 27, 2003. Five of eight laboratories were surveyed as MARSSIM Class 2 survey units. Three of eight rooms were excluded because only sealed sources were used in two rooms and only radioactivity sources at background levels were used in the third room. The NRC's confirmatory survey included all eight rooms.

A minimum of 10 biased samples and 30 systematic samples were collected by the licensee in each survey unit. Direct measurements for alpha and beta radioactivity were conducted at each survey point. In addition, a swipe sample was collected at each survey point. The NRC staff determined that the sampling grid system used and the number of sample points per survey unit were in agreement with MARSSIM recommendations for Class 2 structural surfaces.

The NRC staff conducted a comparison of the proposed DCGLs to the final status survey and confirmatory survey sample results. The FSSR Tables 2-4 and 2-5 provided summaries of the beta and alpha results, respectively. The results were compared to the licensee's proposed DCGLs. All of the licensee's sample results were below its proposed DCGLs. During the confirmatory survey, the inspector collected 82 fixed point measurements of beta and alpha particle activity on floor and wall surfaces in the eight rooms. The NRC's confirmatory sample results are presented in NRC Inspection Report 030-08219/05-001. None of the confirmatory sample results exceeded the DCGLs provided in the FSSR.

Using dose modeling, the NRC compared the licensee's final status survey results to the 25-millirem limit specified in 10 CFR 20.1402. The NRC staff conducted dose modeling using the RESRAD-BUILD computer code, Version 3.3. Using the default values for the building occupancy scenario, obtained from Table 3.1 of the "User's Manual for RESRAD-BUILD Version 3," ANL/EAD/03-1 dated June 2003, the staff conducted dose modeling using the highest alpha (84 dpm/100 cm<sup>2</sup>) and highest beta (1239 dpm/100 cm<sup>2</sup>) sample result. Even with these maximum values, the receptor dose per year remains below the 25-millirem limit specified in 10 CFR 20.1402. Therefore, the as-left radiological conditions in Building 53 are in compliance with the radiological criteria for unrestricted use of the facility.

The licensee collected ambient gamma exposure rate measurements during the final status survey. The licensee did not propose a DCGL for ambient gamma exposure rates; although, the inspector noted that the exposure rates in the eight laboratories were comparable to background exposures. The NRC inspector also measured ambient gamma exposure rates during the confirmatory survey, and all measurements were at background levels.

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**13.0 Financial Assurance**

License Condition 20 of License 05-14892-01 discusses the possession limits for maintaining compliance with the decommissioning financial assurance requirements of 10 CFR 30.35(d). Since the licensee is not requesting termination of the license, the requirements of License Condition 20 continue to remain in effect.

**14.0 Restricted Use/Alternate Criteria**

The licensee did not request a restricted site release as allowed by 10 CFR 20.1403 or use of alternate criteria as allowed by 10 CFR 20.1404. Therefore, this subject area was not reviewed.

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