Action Memorandum

0063100

Site Name and Location:

U.S. Department of Energy
200 West Area, Plutonium Finishing Plant
232-Z Contaminated Waste Recovery Facility
Hanford Site
Benton County, Washington

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Introduction

This Action Memorandum documents approval of the U.S. Department of Energy's (DOE) proposed removal action to demolish and dispose of the 232-Z Contaminated Waste Recovery Facility (Incinerator), as described herein, to mitigate the potential hazards associated with that facility. The removal plan includes stabilization of building contamination within the structure and remaining equipment, followed by building demolition and removal with disposal at the Environmental Restoration Disposal Facility (ERDF) on the Hanford Site.

A 45-day comment period was held from December 15, 2003 through January 30, 2004 for public review of the Engineering Evaluation/Cost Analysis (EE/CA) that provides an analysis of the alternatives considered for this removal action. The limited comments that were received on the EE/CA do not address the substantive nature of the planned removal action and do not require that DOE revise the EE/CA. The description of the removal action provided in the following sections will provide additional clarification for some of the expressed concerns.

This removal action reduces the potential for a release of hazardous substances that could adversely affect public health or welfare and the environment, and is protective of on-site personnel.

I. Purpose

The purpose of this non-time critical removal action is to mitigate threats to onsite workers and personnel, public health or welfare, and the environment by removing hazardous substances in the form of the contaminated incinerator facility from this site.

II. Background and Facility Description

The 232-Z Waste Incinerator Facility processed contaminated waste to recover residual plutonium through incineration and/or leaching of the scrap material. The building is located within the Plutonium Finishing Plant in the 200 West Area on the Hanford Site. The building is approximately 37 feet wide and 57 feet long. It is single storied over the process and storage areas and two stories over the service areas at the north end. The walls are of cinder block construction and materials such as asbestos, lead paint, and PCBs are believed to have been used in its construction. The building is constructed as slab-on-grade; there is no basement. There are floor penetrations for underground ductwork that formerly conveyed process exhaust to the 291-Z Exhaust Facility. Building exhaust was re-routed to a facility-specific stack in 1990.

Equipment failures, as well as spills, resulted in the release of radionuclide and other contamination. Surveys of the 232-Z Facility have indicated radionuclide contamination in a significant percentage of the building. Since 1994, the 232-Z Facility has been in a safe and stable surveillance and maintenance (S&M) mode with controlled access and a negative pressure. Planning efforts are currently underway to complete the 232-Z deactivation process (i.e., cleanout and equipment removal) in approximately fiscal year 2005, to be followed immediately by dismantlement.

The residual radionuclide inventory poses an ongoing threat to site workers. Construction materials incorporated features to reduce fire danger, including asbestos cement underground ducts and piping, asbestos cement floor filter boxes, glass asbestos fiber frames in HEPA filters, lead alkyd based paints for filter frames, and other regulated substances. A seismic analysis has indicated that the building could collapse from earthquake, snowload, or other uncontrolled events, leading to a release of the radionuclide and other hazardous substance inventory.

The contaminants of concern potentially found in the 232-Z Building include the following materials:

- Radionuclides, including Pu^{238}, Pu^{239}, Pu^{240}, Pu^{241}, Pu^{242}, and Am^{241};
- Process chemicals - nitric acid, sodium hydroxide, and aluminum nitrate nonahydrate;
- Construction materials - asbestos, lead, and polychlorinated biphenyls (PCBs) in paint and light ballasts; and
- Incinerator ash - barium, cadmium, chromium, and lead.

DOE has determined that a non-time critical removal is appropriate for the removal of the risk associated with the 232-Z Facility. This decision is consistent with Hanford Federal Facility Agreement and Compliance Order (HFFACO) Interim Milestone M-83-40, which requires that DOE "Complete Transition and Dismantlement of the 232-Z Building", as well as with the DOE and Environmental Protection Agency (EPA) joint guidance "Policy on Decommissioning Department of Energy Facilities under CERCLA". The Department of Energy is the lead agency for conducting this removal action and the Washington Department of Ecology (Ecology) is the lead regulator.

The 232-Z Building was designated as having historical significance and recommended for preservation. A 1994 Memorandum of Agreement resulted in the preparation of a Historic American Engineering Record (HAER), which was approved by the National Park Service in 1995. All of the appropriate steps have been taken to mitigate the effects of building demolition. The satisfactory completion of these steps is documented in a Memorandum of Agreement signed by DOE, the Advisory Council on Historic Preservation, and the Washington State Historic Preservation Office (1994) and affirmed in a letter of concurrence from the Washington State Office of Archaeology and Historic Preservation (September 4, 2002).

III. Threat to Public Health, Welfare, or Environment

The 232-Z Building is contaminated with hazardous substances, primarily radionuclides. A potential threat to public health or welfare and the environment exists through the deterioration

of the facility or its catastrophic collapse. Either of these scenarios could result in a release of hazardous substances to the air or soil.

IV. Endangerment Determination

Actual or threatened releases of hazardous substances from this site may present an imminent and substantial endangerment to the public health or welfare, and the environment.

V. Proposed Action and Estimated Costs

DOE prepared an Engineering Evaluation/Cost Analysis (EE/CA) to evaluate alternatives considered for the removal of the 232-Z Building. These alternatives are described below.

1.0 No Action

Alternative 1, the No Action Alternative, requires that DOE continue routine radiological and hazard monitoring of the 232-Z Building. Activities will be balanced to reduce hazards to workers while reducing the potential for release of contaminants. Over time, major repairs, such as re-roofing and reinforcing structural components may be necessary to contain contaminants within the structure.

In general, as facilities age and deteriorate, S&M must increase and become more aggressive over time. Without an enhanced S&M program, threats associated with an unplanned release and the potential for injuries to workers will increase. Conversely, a more aggressive S&M program would require workers to enter the facility more often, resulting in increased worker exposure.

The building will be removed at some point in the future as part of the overall decommissioning planned for the PFP complex; the 2035 estimated date for completion of Central Plateau activities was used as a worst-case end date. The estimated costs associated with this alternative currently are $400,000 per year for S&M; 32 years of S&M would result in a cost of $12,800,000. This cost is exclusive of any upgrades or other required significant maintenance costs.

2.0 Deactivate, Dismantle, and Dispose to ERDF

Under this alternative, the remaining contaminated equipment will be removed and the building decontaminated, stabilized, and dismantled leaving the building slab. The building slab will be addressed as part of future remedial program activities for underground sites throughout PFP, which is currently in the planning stages. Building debris will be disposed to the ERDF, provided it meets the ERDF waste acceptance criteria. Completion of the removal action will eliminate the risk associated with the residual inventory in the building. Some minor level of exposure risk may remain in contaminated areas of the slab that will remain after building dismantlement. The slab will be characterized to determine the nature and extent of residual contamination and sealed, as appropriate, to prevent exposure to any residual contamination. If a cover is required for the slab, it will extend beyond the building perimeter to reduce the potential for rainwater or snowmelt to transport contaminants that may be present adjacent to or beneath the slab.

The radiological content of the structure will be well characterized and controlled, and the principal hazards associated with D&D will be related to common industrial demolition processes and dust generation. Industrial safety control of airborne hazards will be coordinated with radiological contamination control to ensure that contamination is not spread and that workers are protected.

Approximately 9300 cubic feet of debris are anticipated from this project. The majority of the material is anticipated to designate as low-level waste (LLW)[1]. Some percentage may also contain regulated hazardous or dangerous waste constituents, thus requiring designation as low-level mixed waste (LLMW).

The project scope includes removing an inactive section of a 232-Z duct located inside the 291-Z Exhaust Building. Below ground ductwork between the 232-Z Facility and the 291-Z Exhaust building will be surveyed, characterized for residual contamination and structural integrity, and isolated. Appropriate mitigation actions for the underground ductwork may be applied pending final disposition (e.g., decontamination, in-situ stabilization) as part of the future overall process for PFP closure. Floor penetrations for the ductwork or any utilities that penetrate the slab will be sealed as part of this removal action. Wastes disposed at the ERDF must meet the facility's waste acceptance criteria (WAC) (BHI-00139) and may require treatment and/or size reduction.

Costs for the removal action are budgeted at approximately $5.4 million for "construction" activities and administrative costs to support construction are set at $3.5 million. The total cost for transportation and disposal of waste to ERDF is approximately $32,468. The total cost associated with this alternative is, therefore, estimated at $8,932,468.

3. Deactivate, Dismantle, and Dispose to LLBG

Alternative 3 is the same as Alternative #2, with the exception that waste will be packaged for disposal at the Low Level Burial Grounds (LLBG). Costs for the construction and administrative aspects of the removal action should be equivalent to those described for alternative #2. The cost for transportation and disposal at LLBG will be approximately $116,625. The total cost for this alternative, therefore, is estimated at $9,088,787.

VI. Selected Alternative

DOE and Ecology selected Alternative #2 - deactivate, dismantle, and dispose to ERDF - for the removal of the 232-Z Building. All waste generated from this removal process will be managed and packaged to assure that it meets the waste acceptance criteria for ERDF. All activities will be managed to ensure that airborne contamination does not exceed criteria established in the federal Clean Air Act and the "Washington Clean Air Act" and implementing regulations. All penetrations of the building slab will be sealed and the concrete will be coated with a fixative to prevent any exposure or release from residual contamination, as appropriate. The slab will be remediated as part of the overall remediation of soils and below grade contamination to be conducted at PFP under future CERCLA documentation, currently in the planning stages. The

[1] Low level waste is defined as radioactive waste that is not high-level radioactive waste, spent nuclear fuel, transuranic waste, byproduct material, or naturally occurring radioactive material (DOE 435.1-1).

underground ductwork and any process lines from the building, as well as any adjacent soil contamination, also will be addressed at that time.

This alternative will eliminate any hazards associated with the inventory in the building. In addition, the removal process will include the removal of a section of ductwork in the basement of the 291-Z Exhaust Building and characterization of radionuclide contamination in below grade duct connecting the two buildings. This alternative is the less expensive of the two disposal options with potentially greater overall isolation of the contaminants of concern.

DOE will prepare a removal action work plan (RAWP) and all necessary supporting documentation prior to commencing this removal action and they will be forwarded to Ecology for approval.

VII. Applicable or Relevant and Appropriate Requirements

The EE/CA considered the applicable or relevant and appropriate requirements (ARARs) for the various alternatives evaluated for this removal action. Attachment 1 identifies the ARARs that will be applied for the selected removal alternative.

VIII. Outstanding Policy Issues

Milestone M-83-22 requires that DOE submit an EE/CA(s) for the decommissioning of the remaining structures within the PFP facility, which will evaluate the slab-on-grade endpoint and other below-grade alternatives. Standards for the ultimate remediation of below grade ductwork and final disposition of slab-on-grade conditions for the 232-Z Building will be addressed through this process.

No transuranic waste is expected to be generated during demolition of the 232-Z facility. Any transuranic waste generated during demolition activities will be shipped to WIPP for final disposition in accordance with an approved work plan and a schedule established for remedial actions, no later than September 30, 2024.

IX. Schedule

Milestone M-83-40 requires that DOE complete the removal of the 232-Z Building no later than September 30, 2006. The DOE has established a schedule for process equipment removal, decontamination, and building removal that will accomplish building removal consistent with this due date.

Signature sheet for the Non-Time Critical Removal Action for the removal of the 232-Z Facility at USDOE Hanford Site.

Keith Klein
Manager, Richland Operations Office
United States Department of Energy

11/5/04
Date

Signature sheet for the Non-Time Critical Removal Action for the removal of the 232-Z Facility at USDOE Hanford Site.

Mike Wilson Program Manager, Nuclear Waste Program Washington State Department of Ecology	Date

Attachment 1 – ARARS for the 232-Z Facility Removal Action

Waste Management Standards

Performance objectives for land disposal of low-level radioactive waste are provided in 10 CFR 61, Subpart C, are relevant and appropriate for consideration for disposal of low-level waste generated through the removal action. The relevant requirements are generally incorporated into the waste acceptance criteria for ERDF. Any TRU wastes that are generated through this removal action will be subject to the waste acceptance criteria for the Waste Isolation Pilot Plant.

The RCRA regulations (40 CFR 260 et seq.), as implemented by the State of Washington Dangerous Waste regulations (WAC 173-303), are applicable for the identification, storage, treatment, and disposal of hazardous waste and the hazardous component of mixed waste. All wastes will be treated to comply with applicable land disposal requirements (40 CFR 268) and the waste acceptance criteria for the relevant disposal facility.

The *Toxic Substances Control Act of 1976* (TSCA) regulates the management and disposal of PCBs and PCB waste through regulations found at 40 CFR 761. The ERDF is authorized to accept PCB waste solids for disposal. The LLBG can accept bulk remediation waste with PCB concentrations greater than 50 ppm in the Lined Mixed Waste Unit, and less than 50 ppm in the unlined unit.

Wastes generated under the removal action must conform to the appropriate waste acceptance criteria for the specific disposal site, i.e., ERDF Waste Acceptance Criteria (BHI 00139, 1999) and Hanford Waste Acceptance Criteria (HNF 0063, 2002) for waste that does not meet the ERDF WAC.

Air Emissions

The federal Clean Air Act of 1990 and Amendments (42 United States Code 7401 et seq.), and the Washington Clean Air Act (RCW 70.94) require regulation of air pollutants. Under federal implementing regulations, the Title 40 CFR Part 61, Subpart H requires that radionuclide airborne emissions from the facility shall be controlled so as not to exceed amounts that would cause an exposure to any member of the public of greater than 10 millirem per year effective dose equivalent. The same regulation addresses point sources (i.e., stacks or vents) emitting radioactive airborne emissions, requiring monitoring of such sources with a major potential for radioactive airborne emissions, and requiring periodic confirmatory measurement of such sources sufficient to verify low emissions. Under state implementing regulations, the federal regulations are paralleled by adoption, and in addition require added control of radioactive airborne emissions where economically and technologically feasible [WAC 246-247-040(3) and –040(4) and associated definitions]. In order to address the substantive aspect of these requirements, best or reasonable control technology will be addressed by ensuring that applicable emission control technologies (those reasonably operated in similar applications) will be utilized when economically and technologically feasible (i.e., based upon cost/benefit). Additionally, the substantive aspect of the requirements for monitoring of fugitive or non-point sources emitting radioactive airborne emissions [WAC 246-247-075(8)] will be addressed by sampling the effluent streams and/or ambient air as appropriate using reasonable and effective methods.

The federal implementing regulations also contain requirements for managing asbestos material associated with demolition and waste disposal (Title 40 CFR Part 61, Subpart M).

Cultural and Ecological Resource Protection

The National Historic Preservation Act of 1966 and its implementing regulations (36 CFR 800) require federal agencies to take into account the effect of any activity on any significant cultural resource. The Archeological and Historical Preservation Act of 1974, implemented through regulations at 36 CFR 65, requires action to recover and preserve artifacts in areas where activity may cause irreparable harm, loss, or destruction of significant artifacts. The Endangered Species Act of 1973 and implementing regulations (50 CFR 502) along with WAC 232-12-297 prohibit activities that threaten the continued existence of listed species or that destroy critical habitat. There is no remaining cultural or ecological resource protection issues associated with the removal action.

Surface and Ground Water Impacts

The Washington State Waste Discharge Program (WAC 173-216) requires the use of all known available and reasonable methods to prevent and control the discharge of wastes into the waters of the state. Building dismantlement will likely involve the use of water sprays to limit the amount of dust generated. Water volumes and run off controls will be managed consistent with site-wide discharge and surface water control plans. Water use will be evaluated against the provisions of WAC 173-216 as they apply to site activities.

The following requirements, identified in the EE/CA as potential ARARs or TBCs, are not considered to be of significance for this removal action because all demolition waste is anticipated to be appropriate for disposal to ERDF:

- The Hazardous Materials Transportation Act (49 USC 1801, et seq.) and its implementing regulations identify requirements for packaging and transportation of hazardous materials and wastes offsite.
- Because the LLBG are "offsite" disposal facilities under the CERCLA (40 CFR 300.440), the EPA must authorize their use if waste is sent to that location. If there is a need to transfer any CERCLA wastes to the CWC, that facility also must be determined to be acceptable for offsite shipment of waste.