Action Memorandum for the Decommissioning of the System for Nuclear Auxiliary Power Environmental Test Facility, Building 4024, at the Energy Technology Engineering Center at Santa Susana Field Laboratory, California

May 1, 2007

1. Purpose

This action memorandum documents the Department of Energy's (DOE) selection of the non-time critical removal action alternative recommended in the Building 4024 Decontamination and Decommissioning Engineering Evaluation and Cost Analysis, Santa Susana Field Laboratory (SSFL), California. The EE/CA is included with this Action Memorandum as an attachment.

2. Site description and contaminant evaluation

As the former Systems for Nuclear Auxiliary Power (SNAP) Environmental Test Facility (SETF), Building 4024 tested SNAP reactors in a simulated operational environment. SNAP reactors were originally developed and tested as a nuclear power source for space vehicles. Building 4024 currently consists of an above-grade high-bay and below-grade test vaults. As a result of exposure to neutrons from the reactors, the walls, ceiling, floor and remote handling equipment of the test cells have become radioactive.

Physical location

Figure 1-1 shows the perimeter of ETEC within SSFL. Figure 1-2 is a location map of Building 4024 at the Energy Technology Engineering Center (ETEC). The SSFL is located in Ventura County and borders Los Angeles County. Building 4024 is located in Area IV (ETEC) of the SSFL.

Site characteristics

Building 4024 is a 13,972 square-foot facility constructed with a steel frame, metal siding, and roofing. The above-grade structure consists of a high bay area, which has been cleaned, surveyed, and designated as decommissioned material (DM). The above-grade structures and equipment associated with the general support/operating area and the mechanical/electrical support area were removed in 2005. The two concrete foundations for these buildings remain.

The below-grade structure consists of a concrete vault beneath the high bay area that is separated into three cells. Two cells were used to contain the reactors during testing, with a transfer cell separating the two. Following the end of testing in the mid-1970s, the reactor systems and their associated radioactive test equipment were removed.

The vault is constructed of concrete walls ranging from two feet to nine feet thick, penetrated by various through-tubes, conduits and cooling pipes and lined with aluminum shielding.

A paved yard surrounds the main building. Three radioactive gas holdup tanks and two liquid radioactive waste holdup tanks beneath the paved yard were removed in 1979. Eight empty vaults previously used for the storage of solid radioactive waste remain below the paved yard.

Contamination

Exposure to neutrons from the two operating reactors activated the walls, ceiling, floor and remote handling equipment of the below-grade vault test cells. As a result, radiological contamination in the concrete of the underground test vault is known to be present above surface exposure limits established in DOE Order 5400.5 “Radiation protection of the public and the environment.” The primary radiological constituents of concern (RCOCs) in the activated concrete and piping are Cobalt-60 (Co-60) and Europium-152 (Eu-152).

Concrete cores were removed from the facility test cells and analyzed to determine the location and amount of radioactive materials present. The radioactivity within the cores indicates that induced radioactivity is present to a maximum depth of fifteen inches within the walls and floors; however, as the concrete floors are roughly seventy-two inches (six feet) thick, it is assumed that the underlying bedrock does not contain induced radioactivity. Analysis of the bedrock beneath the vault confirmed no contamination. In addition, eight below-grade vaults under the paved yard to the east of Building 4024 previously used for the storage of solid radioactive wastes may have leaked into the subsurface soil.

Shallow groundwater periodically wells upward through the core holes in the vault base, but no tritium or induced radioactive materials have been detected within collected water samples. This finding indicates that there are no impacts to the groundwater resulting from the SNAP Environmental Test Facility (SETF).

Justification for action

The DOE is undertaking this action as the lead agency pursuant to its Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 104 authority, under Executive Order 12580. Additionally, the U.S. Environmental Protection Agency (EPA) and DOE agreed in a joint policy statement (May 22, 1995) that DOE will decommission its own facilities as non-time critical removal actions consistent with CERCLA. SSFL is not on the National Priorities List.

3. Previous actions

Previous decommissioning activities cleaned, surveyed, and designated the above-grade structure and adjacent building foundations as decommissioned material, so no radiological contamination is expected to exist in the high bay area of Building 4024.

4. State, local and federal authority involvement

DOE will comply with all Applicable or Relevant and Appropriate Requirements (ARARs) related to the decommissioning of Building 4024. The ARARs are listed in Appendix A of the Building 4024 Decontamination and Decommissioning (D&D) EE/CA and will be updated as needed.

The EPA's comments were incorporated into the EE/CA before it was released to the public for comment. EPA will also be consulted on the Sampling and Analysis plan (to be approved by DOE before the final status survey of the Building 4024 site occurs).

5. Chosen action and estimated cost

The scope of the Building 4024 decommissioning involves the complete removal of all above- and below-grade structural components and soil above removal action objectives. The removal action objectives for the remaining site footprint are:

1) Lower the excess cumulative cancer risk to an individual from exposure to site radiological contaminants in soil to a nominal range of 10^{-4} to 10^{-6}, using 10^{-6} as the point of departure;
2) Reduce the non-cancer hazard indices of radiological constituents below a value of 1; and
3) Mitigate potential ecological impacts during and after the removal action.

The desired outcome of the removal action is a Building 4024 footprint that meets radiological standards of protectiveness for unrestricted use.

The EE/CA's preferred alternative, "demolition/removal and off-site disposal," is the action DOE has chosen. This alternative involves the removal of Building 4024 in its entirety and any soil in the project area that fails to achieve the removal action objectives. A MARSSIM-guided final status survey in the excavated areas will be performed to ensure that the objectives have been met.

Cost and schedule

Total implementation costs for this alternative were determined based on standard unit costs from R.S. Means and estimated quantities of materials, professional judgment, previous experience of performing work at ETEC, and vendor estimates. The estimated cost for D&D of Building 4024 under this alternative is approximately $5 million, which includes demolition of the physical structures, excavation of soil, packaging, transportation, and offsite disposal of waste, verification surveys, and site restoration.

Actual demolition time is expected to be three months. At-depth surveying, as well as site restoration, will follow and are expected to last one month each. Four months are required to perform a final survey, which will be conducted after site restoration. Total project duration is expected to be nine months. Off-site disposal will be ongoing during the project.

6. Public participation

Public comments were solicited for the proposed alternative in the Building 4024 D&D EE/CA. Initial EE/CA notification was published in the Los Angeles Daily News on January 26th, 2007 and the Ventura County Star on January 27th, 2007. The Building 4024 D&D EE/CA was presented on February 21, 2007, at a public comment meeting. As a result of public request, DOE extended the public comment period to April 9th, 2007. Comments have also been received via e-mail and letter form.

The Building 4024 D&D EE/CA has been revised based on public feedback during the comment period. Comment responses are noted in the Building 4024 Decontamination and Decommissioning Responsiveness Summary located in the Administrative Record.

This document has been reviewed, accepted, and approved for implementation by:

Thomas Johnson Date 5/1/07

Thomas Johnson
Deputy Federal Project Director
US Department of Energy
Oakland Projects Office

Figure 1-1. Location of ETEC at SSFL

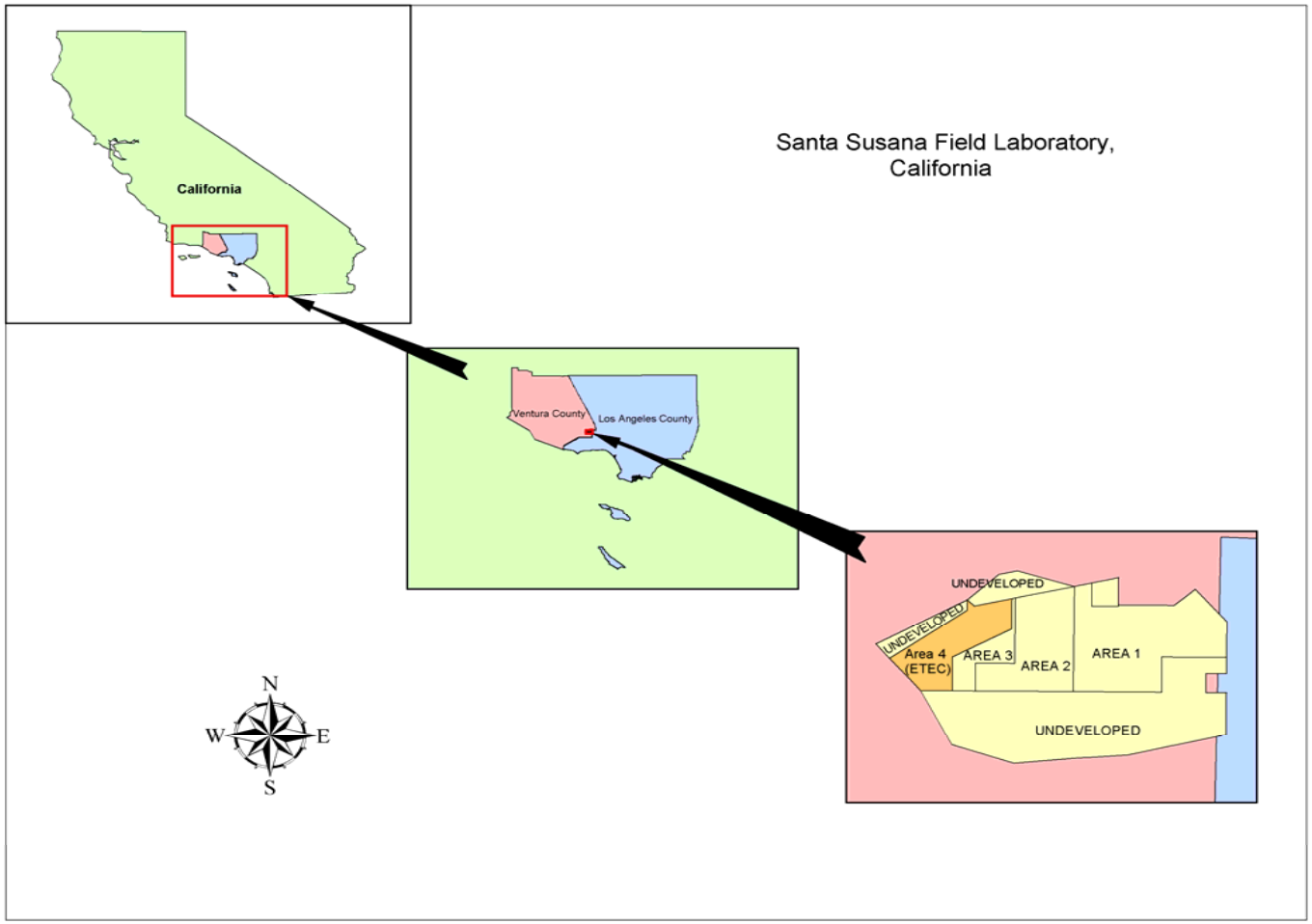

Figure 1-2. Location Map of Building 4024 at ETEC