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Systems for Nuclear Auxiliary Power (SNAP) Environmental Test Facility (SETF) Building 4024

Engineering Evaluation & Cost Analysis (EE/CA) Community Meeting

February 21, 2007

EM Environmental Management

safety ❖ performance ❖ cleanup ❖ closure

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Agenda

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Introductions	Jeff Smyth, Facilitator
Overview	Thomas Johnson, DOE
Building 4024 Removal	Phil Rutherford, Boeing
Public Comments	All

- Building 4024 Removal
  - History
    - SNAP Program
    - Operations
  - Building 4024 Description
  - Prior Sampling
  - Alternatives
    - Removal Action Objectives
    - EPA and DHS Participation
    - Risk-based Soil Cleanup Goals

Why Are We Here?

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- Discussion of DOE's plans for the removal of Building 4024
- Solicit public comments on the proposed removal action
- This plan has been reviewed by EPA and their comments have been addressed

Overview

- The removal action will be conducted in accordance with the 1995 joint DOE/EPA policy memorandum and is consistent with the Comprehensive Response, Compensation and Liability Act (CERCLA)
- Decontamination and demolition of remaining radiological facilities to be performed using non-time-critical (NTC) removal action
- NTC removal action requires completion of an EE/CA report
- This approach includes EPA oversight and public participation

What is an EE/CA?

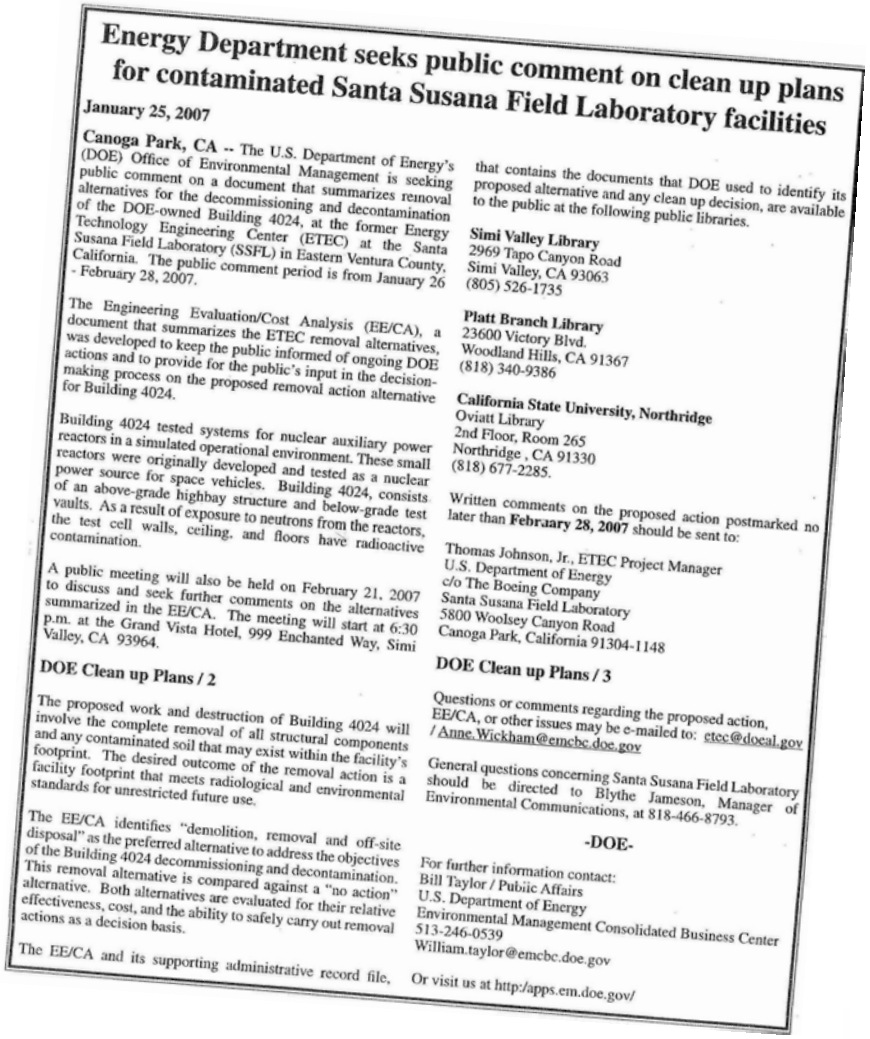
- Engineering Evaluation/Cost Analysis (EE/CA) is a document produced as part of the non-time critical (NTC) removal action process

- NTC removal action is performed when there is no immediate threat to the public or environment and where sufficient time is available for planning and community involvement

- The scope of EE/CA includes:
  - Identification of removal action objectives
  - Evaluation of removal action alternatives
  - Recommendation of removal action

Timeline

- Public Notice: 1/26/07
  - Daily News
  - Ventura County Star
- Administrative Record Established: 1/26/07
  - Three Repositories
  - DOE/ETEC Website
- Community Meeting: 2/21/07
- Public Comments Due: 2/28/07



Energy Department seeks public comment on clean up plans for contaminated Santa Susana Field Laboratory facilities

January 25, 2007

Canoga Park, CA -- The U.S. Department of Energy's (DOE) Office of Environmental Management is seeking public comment on a document that summarizes removal alternatives for the decommissioning and decontamination of the DOE-owned Building 4024, at the former Energy Technology Engineering Center (ETEC) at the Santa Susana Field Laboratory (SSFL) in Eastern Ventura County, California. The public comment period is from January 26 - February 28, 2007.

The Engineering Evaluation/Cost Analysis (EE/CA), a document that summarizes the ETEC removal alternatives, was developed to keep the public informed of ongoing DOE actions and to provide for the public's input in the decision-making process on the proposed removal action alternative for Building 4024.

Building 4024 tested systems for nuclear auxiliary power reactors in a simulated operational environment. These small reactors were originally developed and tested as a nuclear power source for space vehicles. Building 4024, consists of an above-grade highbay structure and below-grade test vaults. As a result of exposure to neutrons from the reactors, the test cell walls, ceiling, and floors have radioactive contamination.

A public meeting will also be held on February 21, 2007 to discuss and seek further comments on the alternatives summarized in the EE/CA. The meeting will start at 6:30 p.m. at the Grand Vista Hotel, 999 Enchanted Way, Simi Valley, CA 93964.

DOE Clean up Plans / 2

The proposed work and destruction of Building 4024 will involve the complete removal of all structural components and any contaminated soil that may exist within the facility's footprint. The desired outcome of the removal action is a facility footprint that meets radiological and environmental standards for unrestricted future use.

The EE/CA identifies "demolition, removal and off-site disposal" as the preferred alternative to address the objectives of the Building 4024 decommissioning and decontamination. This removal alternative is compared against a "no action" alternative. Both alternatives are evaluated for their relative effectiveness, cost, and the ability to safely carry out removal actions as a decision basis.

The EE/CA and its supporting administrative record file, that contains the documents that DOE used to identify its proposed alternative and any clean up decision, are available to the public at the following public libraries.

Simi Valley Library
2969 Tapo Canyon Road
Simi Valley, CA 93063
(805) 526-1735

Platt Branch Library
23600 Victory Blvd.
Woodland Hills, CA 91367
(818) 340-9386

California State University, Northridge
Oviatt Library
2nd Floor, Room 265
Northridge , CA 91330
(818) 677-2285.

Written comments on the proposed action postmarked no later than **Febraary 28, 2007** should be sent to:

Thomas Johnson, Jr., ETEC Project Manager
U.S. Department of Energy
c/o The Boeing Company
Santa Susana Field Laboratory
5800 Woolsey Canyon Road
Canoga Park, California 91304-1148

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Questions or comments regarding the proposed action, EE/CA, or other issues may be e-mailed to: etec@doeal.gov / Anne.Wickham@emcbc.doe.gov

General questions concerning Santa Susana Field Laboratory should be directed to Blythe Jameson, Manager of Environmental Communications, at 818-466-8793.

-DOE-

For further information contact:
Bill Taylor / Public Affairs
U.S. Department of Energy
Environmental Management Consolidated Business Center
513-246-0539
William.taylor@emcbc.doe.gov

Or visit us at http:/apps.em.doe.gov/

Santa Susana Field Laboratory (SSFL)

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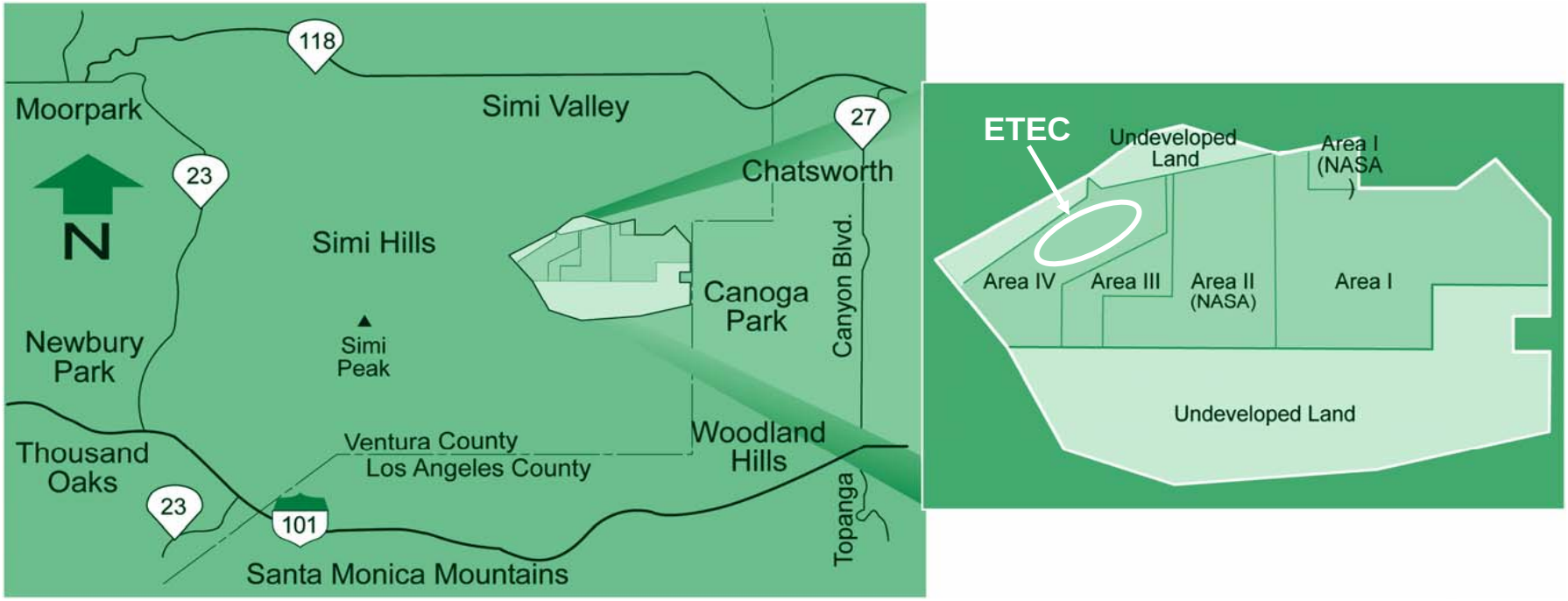

SSFL Looking East

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- Overview — Thomas Johnson, DOE
- Building 4024 EE/CA — Phil Rutherford, Boeing
  - History
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  - Prior Sampling
  - Alternatives
    - Removal Action Objectives
    - EPA and DHS Participation
    - Risk-based Soil Cleanup Goals
- Community Comments — All

SNAP Program History

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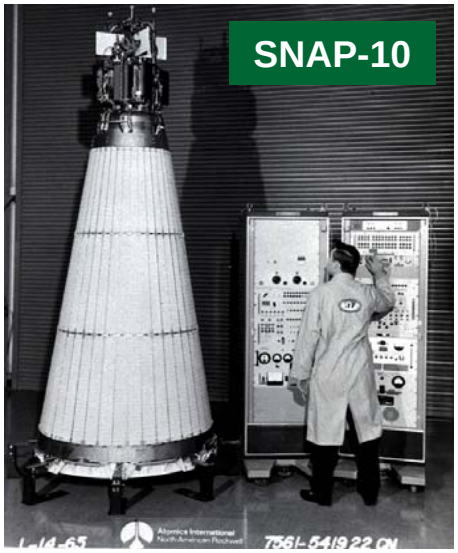
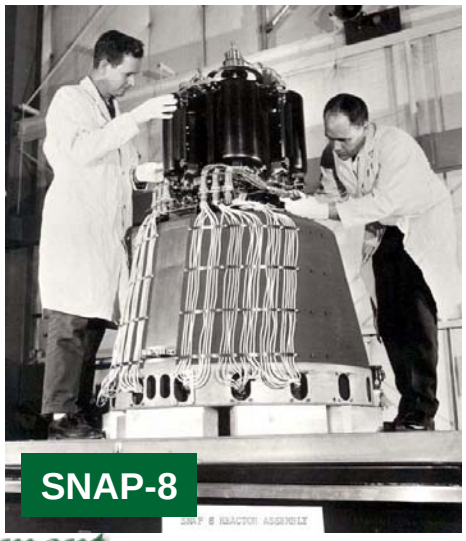
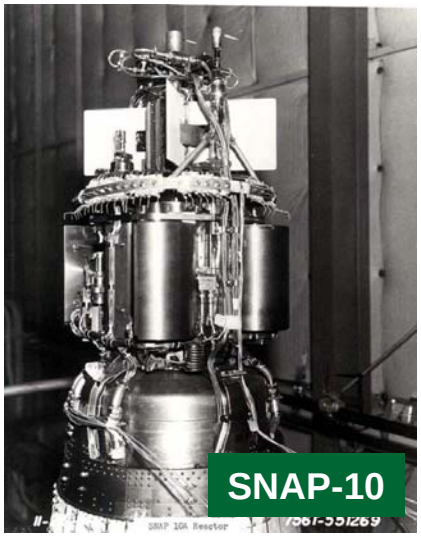
- Systems for Nuclear Auxiliary Power (SNAP)
- Nuclear power for satellites in the 1960s
- Atomics International designed, manufactured and tested many SNAP reactor evolutions including SNAP 2, SNAP 4, SNAP 8 and SNAP 10
- SNAP 10 was the first and only nuclear reactor launched into space by the United States







SNAP Environmental Test Facility

Building 4024

Building 4024 Operational Use/History

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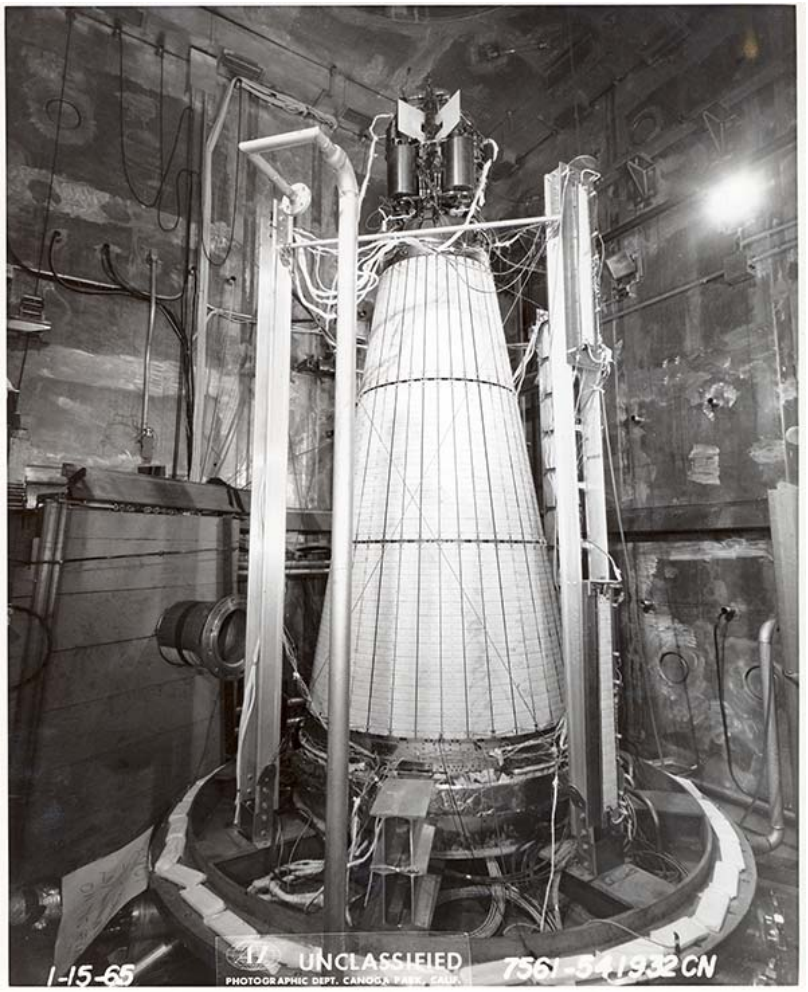
- Constructed in 1960
- Used for testing SNAP reactors in a simulated operational environment of space
- Several SNAP prototype reactors tested for short periods of time during the 1960s
- Reactors were low power – approximately 0.001% of the power level of a commercial electricity plant



Cut-away of Building 4024 Reactor Cells

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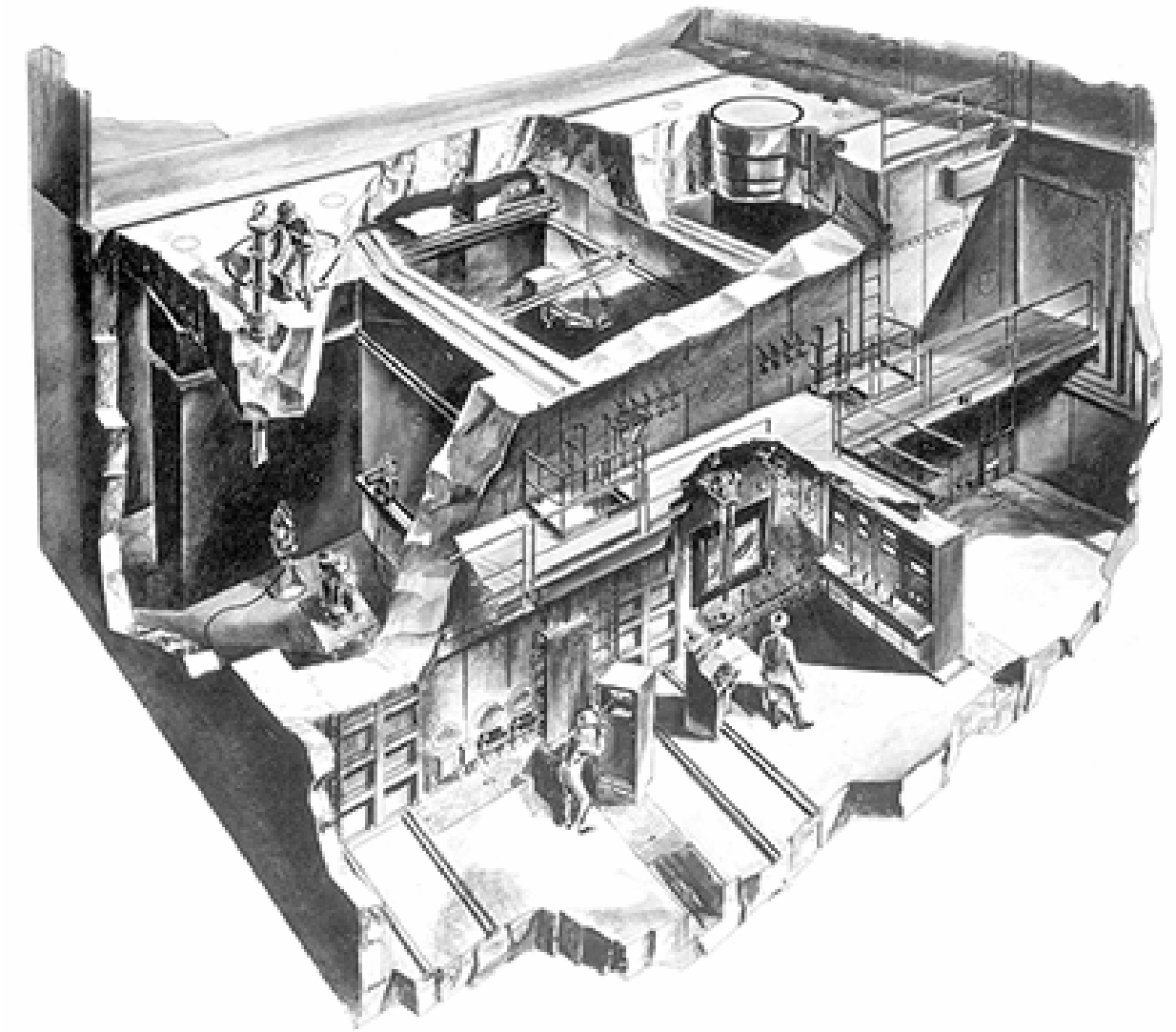

Aluminum-sheathed Reactor Vault

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Exposure Levels ≤ 10 times background

Vault Door

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Concrete Coring Surveys

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- Boeing Report, RS-00025, “Building 4024 Concrete Core Sampling,” 12/15/2004
- Concrete core data from the reactor vaults taken in 2004 indicates neutron activiation with a maximum of 9.3 pCi/g of Co-60 and a maximum of 105 pCi/g of Eu-152
- Measurable activation exists only within the inner 15 inches of concrete
- No H-3, Eu-154, Fe-55 or Ni-63 was detected
- Soil and bedrock under the reactor vaults were not contaminated

Alternatives Examined in the EE/CA

- Alternatives evaluated for effectiveness, implementability and cost:
- No Action
  - Required by CERCLA
  - Highly implementable
  - Ineffective … no radiological constituents of concern removed
  - Buildings and structures remain on-site under surveillance and maintenance
  - $15 million cost over 30 years
- Demolition/Removal and Offsite Disposal (Preferred alternative)
  - Demolition technically achievable
  - Effective in removing radiological constituents of concerns
  - $5 million approximate cost

Removal Action Objectives (RAOs)

- Removal of all above- and below-grade buildings, foundations, utilities and physical components associated with Building 4024
- Removal of radiologically impacted soils within the Building 4024 footprint
- Conduct a survey of the facility footprint using MARSSIM* protocols
  - Oak Ridge Institute of Science and Education (ORISE) and the Department of Health Services** will perform verification surveys

* *MARSSIM is the Multi-Agency Radiation Survey and Site Investigation Manual written by the EPA, NRC, DOE and DOD*

*** Based on comments received at the 2/21/07 meeting, DHS has not made a decision concerning the extent of their participation in verification surveys (This footnote was added after the 2/21/07 meeting)*

Health-based Risk Criteria

- 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

Regulatory Agencies' Role

- EPA
  - EPA participation and oversight as described in the 1995 joint DOE/EPA policy memorandum on decommissioning
  - EPA reviewed and commented on the draft EE/CA, including refinement of the removal action objectives
  - EPA would continue to participate in the proposed project including review of the final status survey (FSS) sampling and analysis plan (SAP)
- DHS – Radiologic Health Branch
  - DHS would perform verification surveys and sampling of the building footprint following the demolition and FSS*

** Based on comments received at the 2/21/07 meeting, DHS has not made a decision concerning the extent of their participation in verification surveys (This footnote was added after the 2/21/07 meeting)*

Constituents of Concern
(Radiological)

- Soil/bedrock will be sampled for the following constituents of concern (COCs)
- Primary COCs:
  - Eu-152
  - Co-60
- Secondary COCs:
  - Cs-137, Sr-90 (fission products)
  - H-3, Eu-154, Fe-55, Ni-59, Ni-63, Mn-54, K-40, Na-22 (neutron activation products)
  - U-234, U-235, U-238 (nuclear fuel material)
  - Am-241, Pu-238, Pu-239, Pu-240, Pu241, Pu-242 (transuranic elements)

Residual Soil Concentration Goals

Radionuclide	Soil Concentration (pCi/g)	
	EPA 10^{-6} Risk Goal	EPA 10^{-4} Risk Level
Am-241	1.87	187
Co-60	0.0361	3.61
Cs-134	0.157	15.7
Cs-137	0.0597	5.97
Eu-152	0.0416	4.16
Eu-154	0.0499	4.99
Fe-55	2,690	269,000
H-3	2.28	228
K-40	0.108	10.8
Mn-54	0.692	69.2
Na-22	0.0865	8.65
Ni-59	208	20,800
Ni-63	94.8	9,480
Pu-238	2.97	297
Pu-239	2.59	259
Pu-240	2.60	260
Pu-241	406	40,600
Pu-242	2.73	273
Ra-226	0.193	19.3
Sr-90	0.231	23.1
Th-228	0.154	15.4
Th-232	3.10	310
U-234	4.01	401
U-235	0.195	19.5
U-238	0.742	74.2

Point of Departure

CERCLA Risk Range

Theoretical Risk* Map of Area IV

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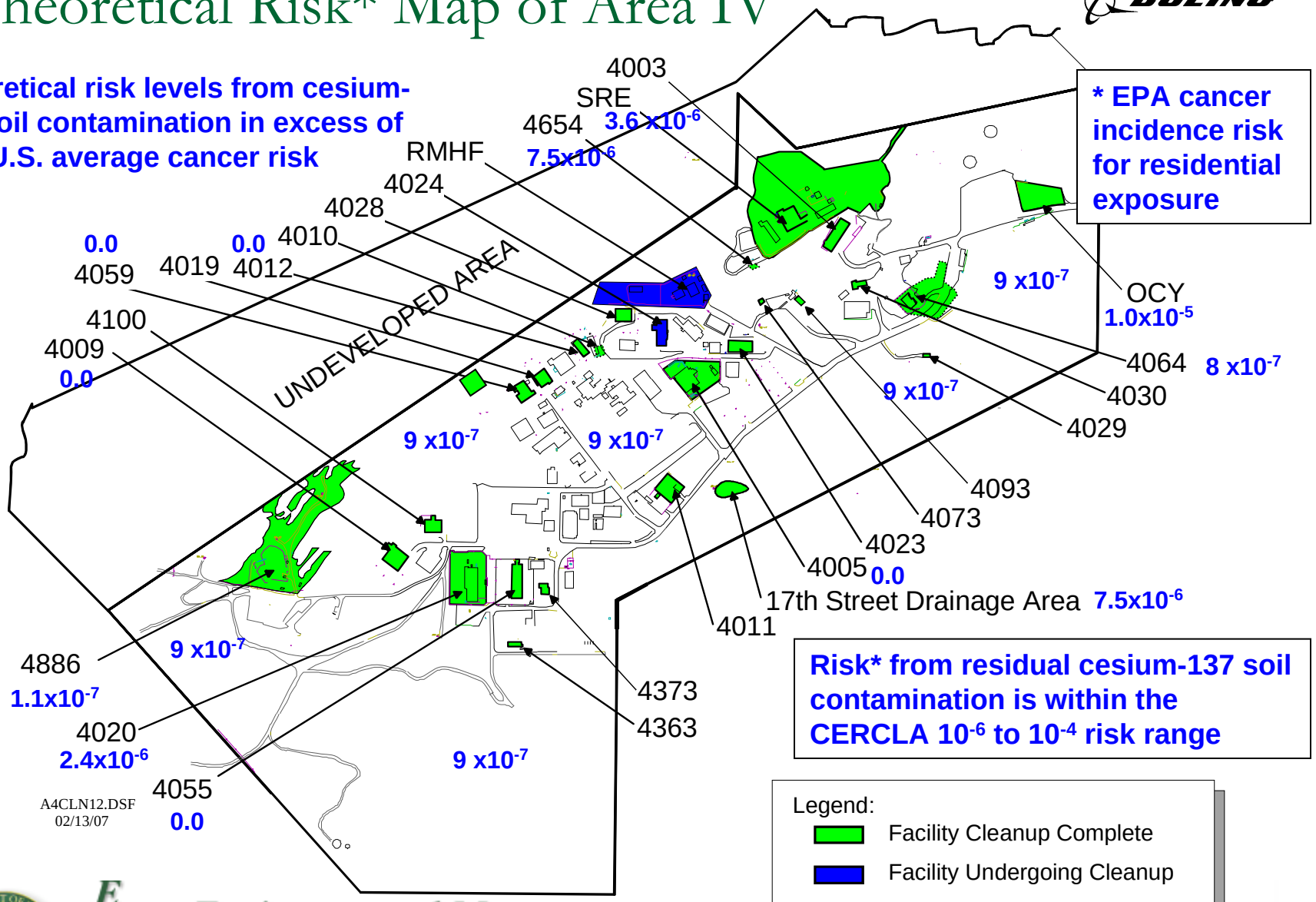
Theoretical risk levels from cesium-137 soil contamination in excess of 0.23 U.S. average cancer risk



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*** EPA cancer incidence risk for residential exposure**

Risk* from residual cesium-137 soil contamination is within the CERCLA 10^{-6} to 10^{-4} risk range

Legend:
- Facility Cleanup Complete
- Facility Undergoing Cleanup

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Summary

- Process consistent with CERCLA and includes EPA's participation and oversight
- Two alternatives evaluated in the EE/CA
  - No action
  - Demolition/removal and off-site disposal (preferred)
- Additional information regarding the EE/CA is available in the Administrative Record file in the local library repositories and on the DOE ETEC website
- Public comments requested
- Response to comments regarding the EE/CA will be made part of the Administrative Record file in the local library repositories and on the DOE ETEC website

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Community Comments

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