ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

February 16, 1999

Mr. Anand Gupta
U.S. Department of Energy
EM-43
Cloverleaf Building
Washington, DC 20585-0002

SUBJECT: ADDENDUM TO THE VERIFICATION SURVEY REPORT FOR BUILDINGS T019 AND T024, SANTA SUSANA FIELD LABORATORY, VENTURA COUNTY, CALIFORNIA (ORISE 1996a)

Dear Mr. Gupta:

The Environmental Survey and Site Assessment Program (ESSAP) of the Oak Ridge Institute for Science and Education (ORISE) recently completed the follow-up verification of Building T019 (now known as Building 4019) at the Santa Susana Field (SSFL) Laboratory in Ventura County, California (Figure 1). Rocketdyne/Boeing, formerly known as Rockwell, operates the SSFL. The Energy Technology Engineering Center (ETEC) is that portion of the SSFL operated for the Department of Energy (DOE), where nuclear energy research and development programs were performed. Contract work for the Atomic Energy Commission (AEC) and the Energy Research and Development Administration (ERDA), predecessor agencies to the DOE, began in the early 1950's. Specific programs conducted for AEC/ERDA/DOE involved engineering, developing, testing, and manufacturing operations for nuclear reactor systems and components. Rocketdyne/Boeing is currently decommissioning a number of those facilities that were associated with the various nuclear research programs.

Building 4019 was constructed in 1962 and served as the Systems for Nuclear and Auxiliary Power (SNAP) System Nuclear Qualification Test Facility where SNAP reactors, using fully encapsulated highly enriched uranium, were tested at zero power. Building 4019 is located on B Street in the north-central part of Area IV (Figure 2). Total area of the building is 595 m^2 divided among a high bay area that also includes a below-grade test vault, a low bay office-control center, and a storage vault that was originally built for nuclear fuel element storage (Figure 3). Building construction is of steel framing and siding and a built-up roof.

Subsequent to termination of the SNAP program in 1970, all SNAP components were removed and a facility survey performed. Documentation indicated that there were no releases of the uranium fuel or fission products and that neutron activation of construction materials was negligible (Rockwell 1988). Rockwell/Rocketdyne released the building from radiological controls and redesignated it as the ETEC Construction Staging and Computer Facility.

ESSAP performed verification activities for the facility during September 1995 that included document reviews and independent measurements and sampling. These activities identified deficiencies in the final status survey report and the presence of residual contamination on the floor of the Building 4019 high bay area. In addition, ESSAP was unable to access the test vault for survey at that time. The results of this initial verification were documented in a survey report that was previously submitted to the DOE (ORISE 1996a). Rocketdyne/Boeing has since completed the remediation of the residual contamination that ESSAP identified within the facility and performed additional radiological surveys to address deficiencies noted in their previous final status survey report (Boeing 1998 and ORISE 1996b). This letter report serves as an addendum to the 1996 ESSAP verification report.

On September 29, 1998, ESSAP performed a reverification of Building 4019 that included surveys of both the test vault as well as the previously identified contaminated area in the high bay area. The survey was conducted in accordance with a DOE approved site-specific survey plan (ORISE 1998). Survey procedures included alpha plus beta surface scans using gas proportional detectors coupled to ratemeter-scalers with audible indicators, measurements of total and removable surface activity levels, and exposure rate measurements using a microrem meter. Figures 4 and 5 show measurement locations.

ESSAP's surface scans of the high bay area and the test vault did not identify any locations of elevated direct radiation. Surface activity levels are summarized in Table 1. Total surface activity levels within the test vault ranged from -14 to -7 dpm/100 cm^2 for alpha and -190 to 330 dpm/100 cm^2 for beta. For the previously contaminated high bay area, the activity levels ranged from 0 to 43 dpm/100 cm^2 for alpha and 220 to 550 dpm/100 cm^2 for beta. Removable activity levels were all less than the respective minimum detectable concentration level of 9 dpm/100 cm^2 for alpha and 15 dpm/100 cm^2 for beta. The exposure rate within the test vault averaged 12 μR/h. ESSAP compared these exposure rate levels to the Rocketdyne/Boeing-determined average interior background exposure rate of 8 μR/h.

Surface activity levels were compared to the appropriate residual radioactive material guidelines specified in DOE Order 5400.5 for uranium and mixed fission and activation products (DOE 1990). The applicable guidelines for uranium are as follows:

<u>Total Activity</u>
5,000 α dpm/100 cm^2, average in a 1 m^2 area
15,000 α dpm/100 cm^2, maximum in a 100 cm^2 area

<u>Removable Activity</u>
1000 α dpm/100 cm^2

and the guidelines for beta-gamma emitters are:

Total Activity
5,000 β-γ dpm/100 cm^2, average in a 1 m^2 area
15,000 β-γ dpm/100 cm^2, maximum in a 100 cm^2 area

Removable Activity
1,000 β-γ dpm/100 cm^2

All surface activity levels satisfied these guidelines. The DOE's exposure rate guideline is 20 μR/h above background, although Rocketdyne/Boeing has elected to use a more restrictive guideline of 5 μR/h above background. Interior exposure rates at one meter above the surface were less than the more restrictive criterion of 5 μR/h above background.

Please contact me at (423) 576-5073 or Eric Abelquist at (423) 576-3740 should you have any questions or we may provide additional information.

Sincerely,

Timothy J. Vitkus
Survey Projects Manager
Environmental Survey and
Site Assessment Program

TJV:dkh

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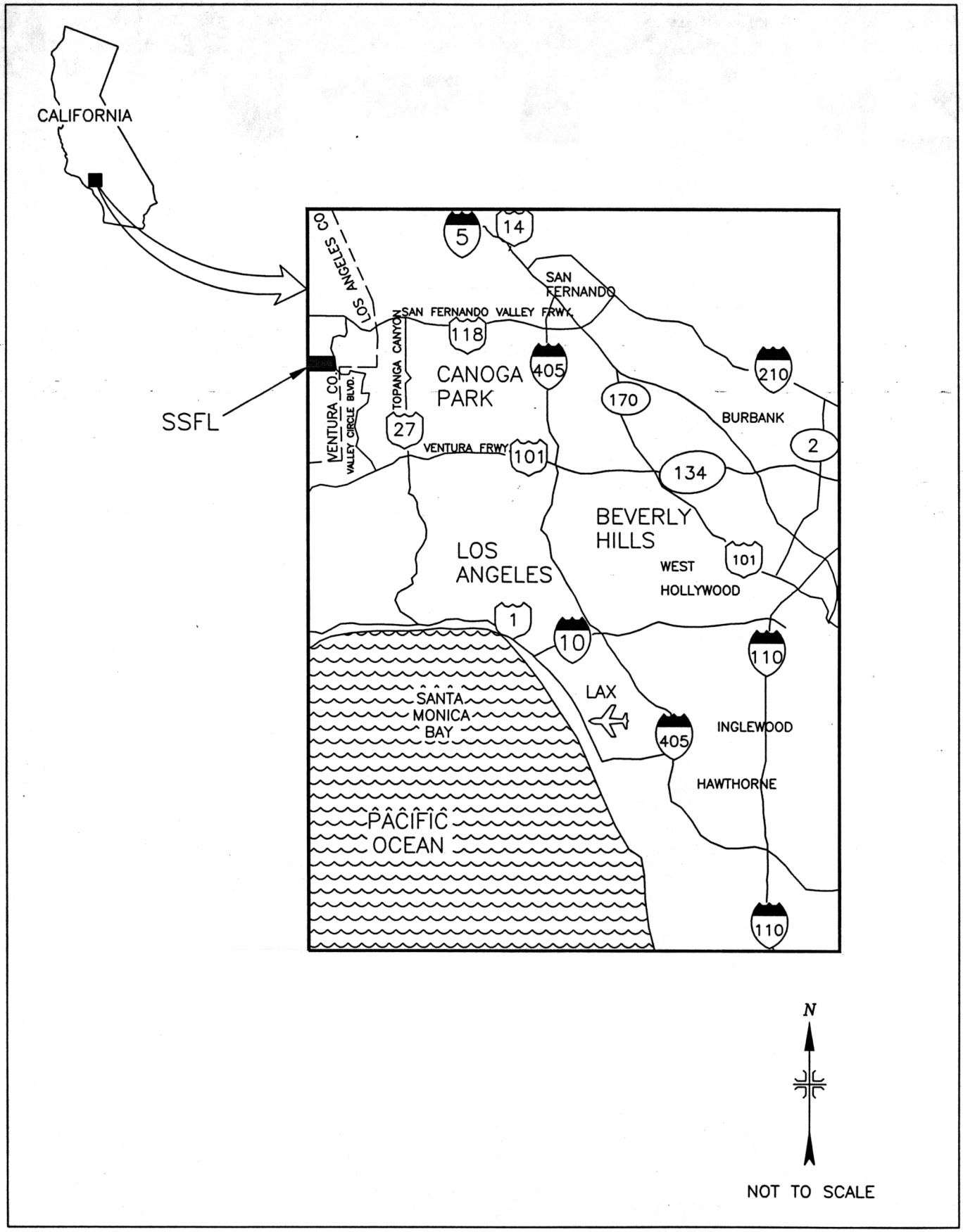

FIGURE 1: Los Angeles, California Area – Location of the Santa Susana Field Laboratory Site

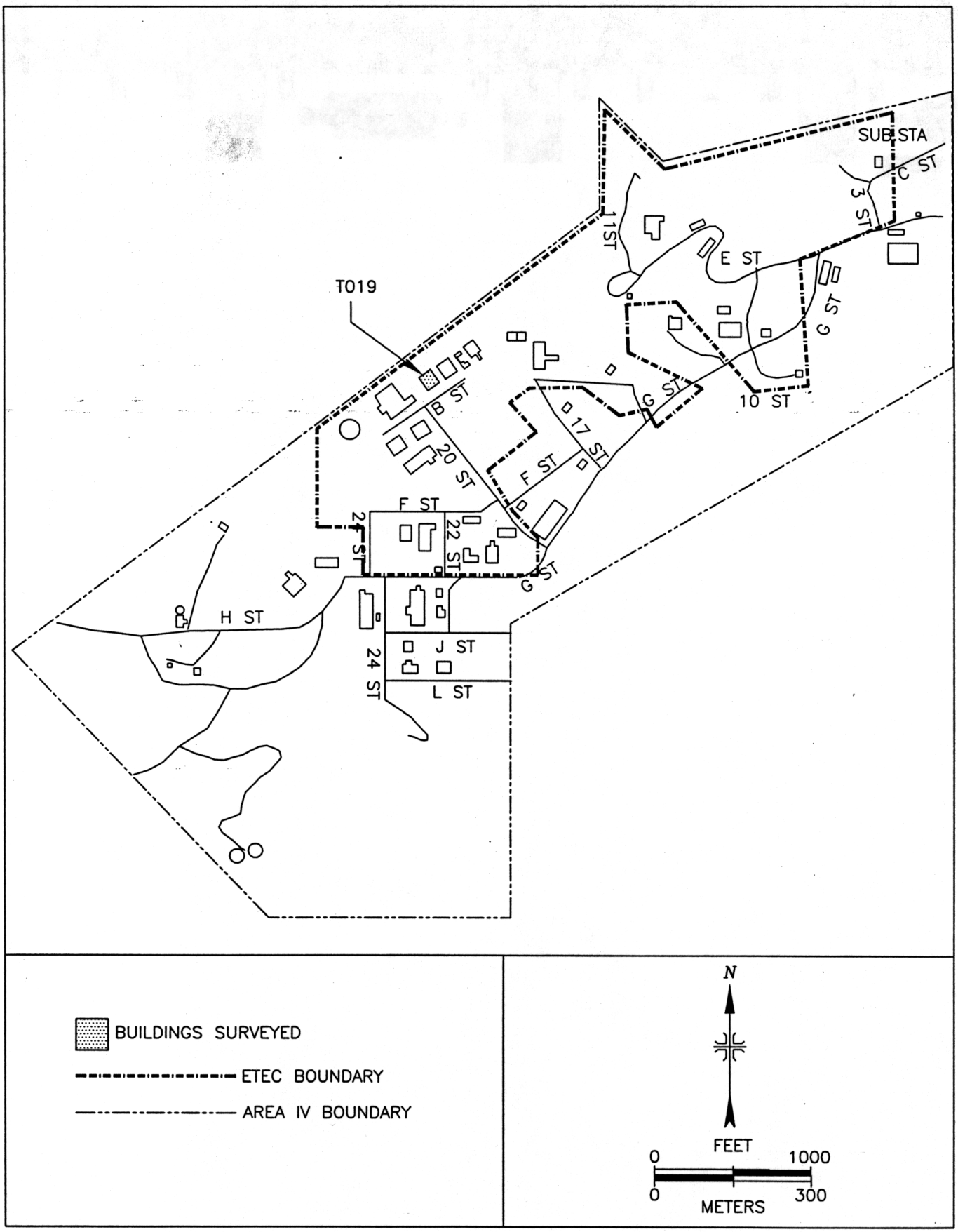

FIGURE 2: Santa Susana Field Laboratory Area IV, Plot Plan – Location of Surveyed Areas

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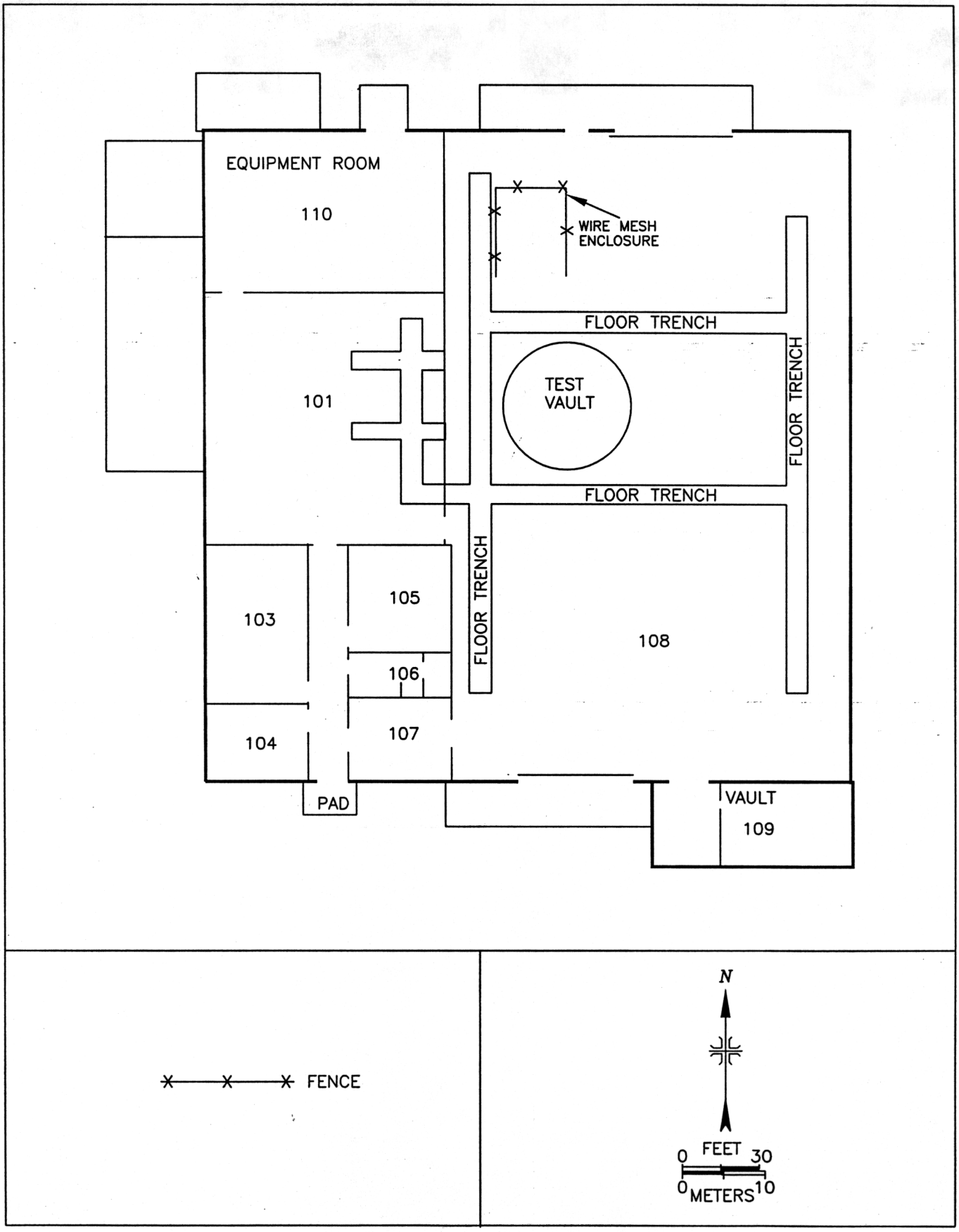

FIGURE 3: Building 4019 – Floor Plan

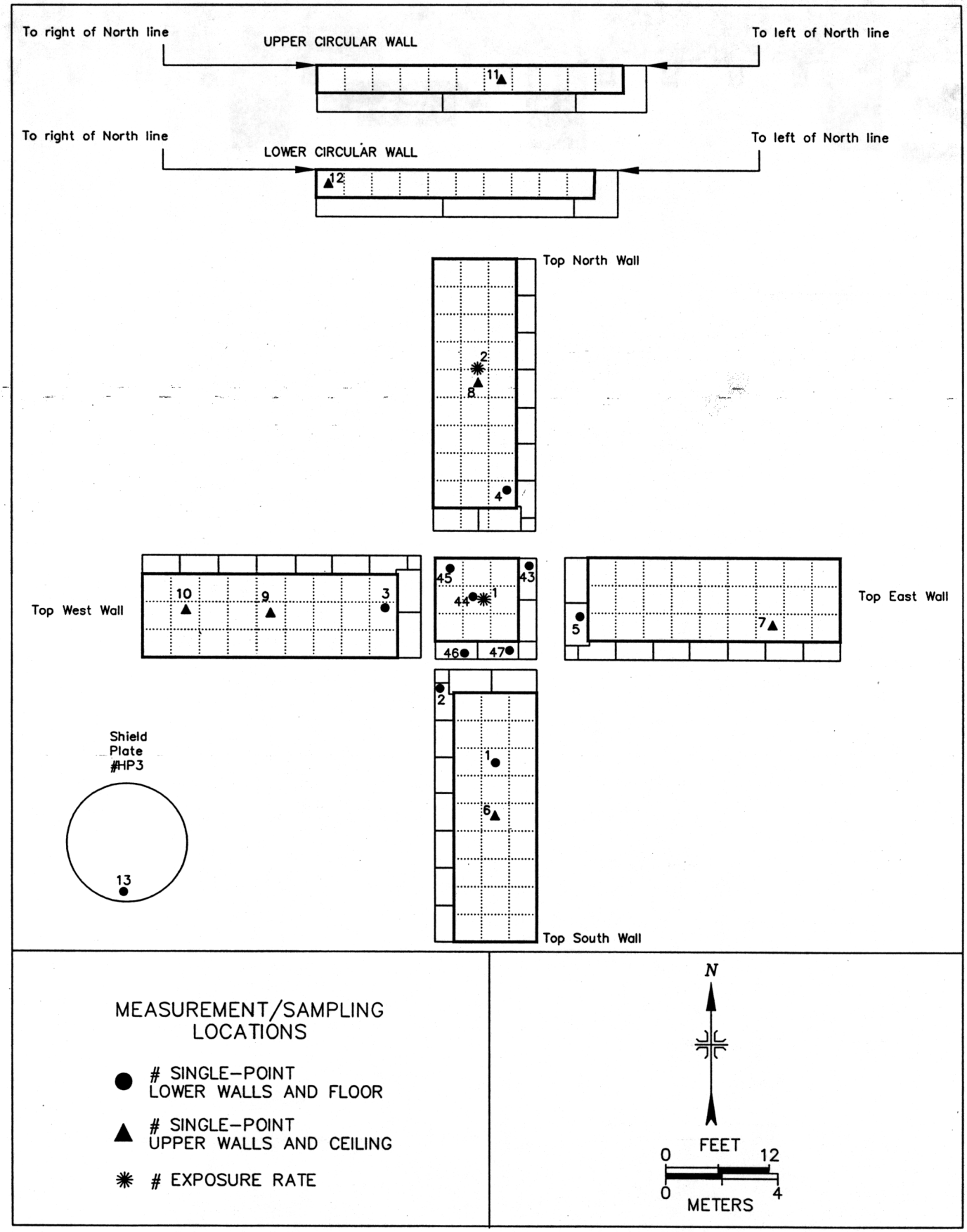

FIGURE 4: 4019 Test Vault – Measurement and Sampling Locations

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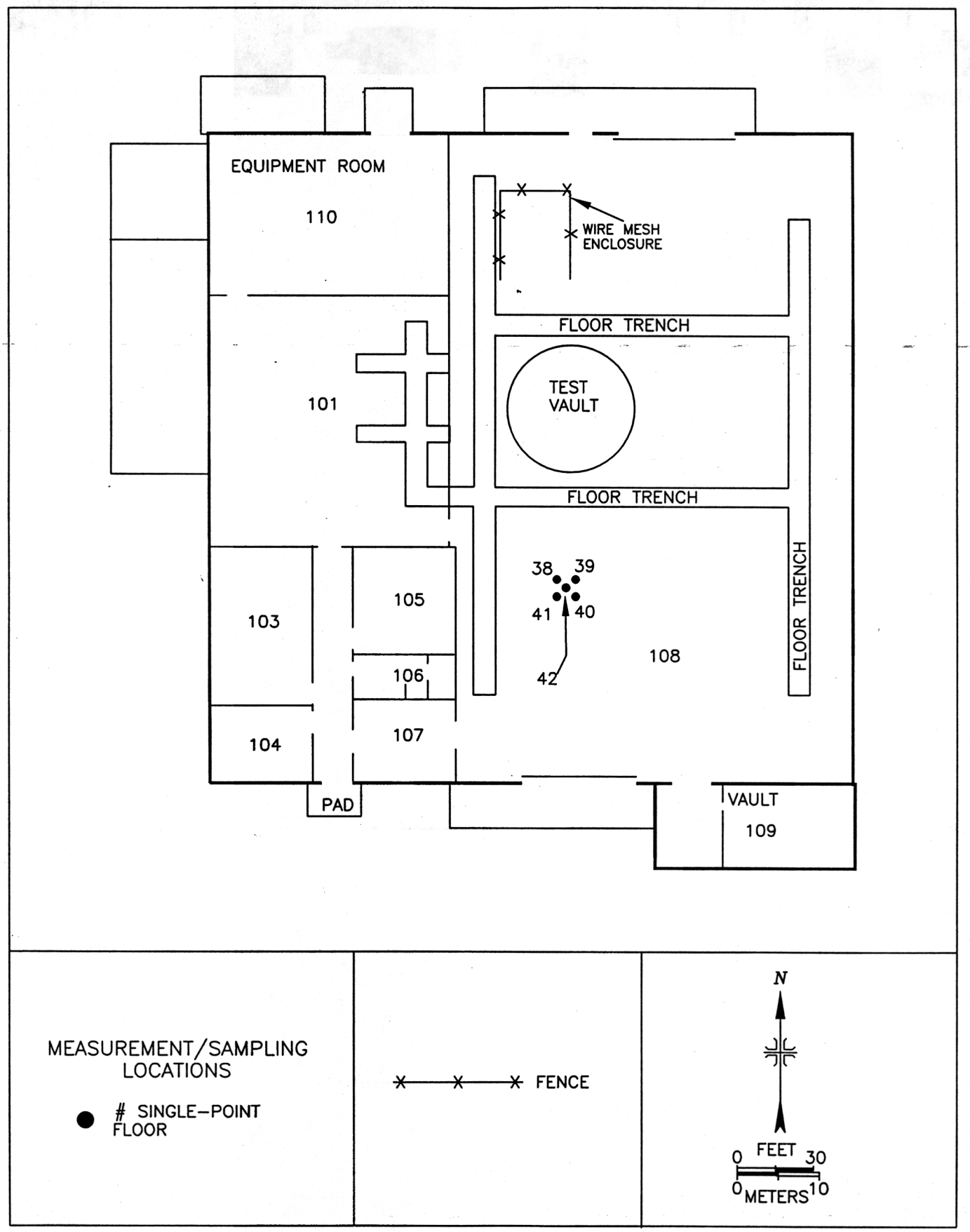

FIGURE 5: Building 4019 – Measurement and Sampling Locations

TABLE 1

SUMMARY OF SURFACE ACTIVITY LEVELS
BUILDING T019
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Location[a]	Surface Activity Level dpm/100 cm²		Removable Activity Level dpm/100 cm²	
	Alpha	Beta	Alpha	Beta
Building T019 Test Vault				
43	-14	-88	0	-3
44	-14	-170	0	5
45	-14	3	0	-6
46	-14	11	0	5
47	-7	-96	0	-2
1	-14	-104	0	2
2	-7	36	0	-5
3	-14	-148	0	-2
4	-14	-186	0	-3
5	-14	49	0	-3
6	-7	-115	0	4
7	-14	109	0	1
8	-14	-82	0	-5
9	-14	-131	2	1
10	-14	30	2	-3
11	-14	118	0	-1
12	-14	11	0	-1
13	-14	328	0	-1

TABLE 1 (continued)

SUMMARY OF SURFACE ACTIVITY LEVELS
BUILDING T019
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Location[a]	Surface Activity Level dpm/100 cm²		Removable Activity Level dpm/100 cm²	
	Alpha	Beta	Alpha	Beta
Building T019 High Bay Post-Remedial Action				
38	43	545	0	3
39	36	219	0	1
40	0	271	0	5
41	7	454	0	1
42	36	490	0	-1

[a]Refer to Figures 4 and 5.

REFERENCES

Boeing North American, Inc./Rocketdyne Division (Boeing). SNAP Test Chamber, Building 4019, Final Survey Procedure. Canago Park, California; August 24, 1998.

Oak Ridge Institute for Science and Education (ORISE). Verification Survey of Buildings T019 and T024, Santa Susana Field Laboratory, Rockwell International, Ventura County, California. Oak Ridge, TN; February, 1996a.

Oak Ridge Institute for Science and Education. Comments on the Final Status Survey Documentation for the Interim Storage Facility; Buildings T013, T019, T024, T030, and T641; The Storage Yard West of Buildings T626 and T038; and The NW Area; Santa Susana Field Laboratory, Ventura County, CA. Oak Ridge, TN; January 11, 1996b.

Oak Ridge Institute for Science and Education. Proposed Verification Survey Plan for the Desoto Mass Spectrometry Laboratory (104), the Building 4019 Test Vault, and the T064 Side Yard, Santa Susana Field Laboratory, Boeing North America, Inc., Ventura County, California. Oak Ridge, TN; September 23, 1998.

Rockwell International (Rockwell). Radiological Survey of Buildings T019 and T013; An Area Northwest of T059, T019, T013, and T012; and A Storage Yard West of Buildings T626 and T038. Ventura County, CA; August 26, 1988.

U.S. Department of Energy (DOE). Radiation Protection of the Public and the Environment. Washington, DC: DOE Order 5400.5; February 1990.