

## Site Summary – Building 4019

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### Site Identification:

Building 4019  
SNAP Flight System Critical Facility  
Acceptance Test Facility  
ETEC Construction Staging and Computer Facility  
Includes Building 4719, Substation

### Operational Use/History:

- Constructed in 1962.
- Building 4019 was built to perform criticality acceptance tests of SNAP reactors before they were delivered for launch.<sup>1</sup>
- Three reactors (FS-1, FS-4 and FS-5) were assembled and tested from 1964 to 1965.<sup>2</sup>
- In 1965, all nuclear materials were removed from Building 4019 when the last SNAP reactor was removed.<sup>1</sup>
- Building 4019 was reassigned for non-nuclear use in the 1970s and 1980s.<sup>2</sup>
- In 1998, the small area identified in the 1996 ORISE survey was decontaminated.<sup>2</sup>
- Building 4019 is now inactive.<sup>3</sup>

### Site Description:

- Building 4019 is a steel-framed building with a built-up roof on a concrete slab. The 10-foot tall low bay section is 60 x 28 feet and contains offices, conference room, restrooms and an equipment room. The 36-foot tall high bay section is 60 x 45 feet and contains a cinder block storage room and a below-grade vacuum test vault.<sup>3</sup>
- Serviced by Substation 4719.

### Relevant Site Information:

- All radioactive and nuclear material handled at the facility was fully encapsulated.<sup>3</sup>
- One incident was reported that could have resulted in a release to the environment.
  - On April 10, 1976, a quality assurance inspection personnel was unable to return a source material to the safe directly after use. It was later discovered that the source had detached from its travel cable and the source was reattached and returned to the safe. Release of contamination to the environment as a result of this incident was unlikely (A0304).

### Radiological Surveys:

- In 1988, Rocketdyne performed a radiological survey to determine if any radioactive material had been accidentally left behind to such an extent that further radiological inspection and/or decontamination was warranted.

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- The survey covered Building 4019 along with one other building and two adjacent areas through ambient gamma exposure rate surveys.<sup>4</sup>
  - Ambient gamma exposure rates corrected for background measured in Building 4019 varied from 0.04  $\mu\text{R/hr}$   $\pm$  1.09  $\mu\text{R/hr}$  (limit is 5.0  $\mu\text{R/hr}$  above background).
  - The survey concluded that none of the areas were contaminated with residual radioactivity and that all areas meet the unrestricted use criteria for release.
  - One anomalous measurement was recorded in the high bay but 21 subsequent measurements and a survey for beta activity in the area proved that it was an anomaly.
- ORISE performed a verification survey in 1996 to validate the cleanup procedures and survey methods used by Rockwell/Rocketdyne. The survey conducted surface scans, surface activity level measurements and exposure rate measurements.<sup>5</sup>
  - The survey concluded that the unrestricted use release criteria were exceeded in a small area of Building 4019, the documentation of previous surveys was not adequate, and the vault of Building 4019 was not accessible for survey.
  - The document review found that the documentation did not provide a clear description of the sequence of events necessary for demonstrating that the subject areas meet the requirements for release to unrestricted use.
  - Surface scans found one area of elevated beta radiation in the high bay portion of Building 4019. No other areas had elevated levels of alpha, beta or gamma radiation.
    - Total surface alpha: <55 dpm/100cm<sup>2</sup> (limit is 5,000 dpm/100cm<sup>2</sup>).
    - Total surface beta: <1,400 – 11,000 dpm/100cm<sup>2</sup> (limit is 5,000 dpm/100cm<sup>2</sup>).
    - Removable alpha: <12 dpm/100cm<sup>2</sup> (limit is 1,000 dpm/100cm<sup>2</sup>).
    - Removable beta: <16 dpm/100cm<sup>2</sup> (limit is 1,000 dpm/100cm<sup>2</sup>).
    - Ambient gamma: between 10 and 11  $\mu\text{R/hr}$  compared to a background rate of 8  $\mu\text{R/hr}$  (limit is 5.0  $\mu\text{R/hr}$  above background).
- In 1998, Boeing performed a final status survey. The survey covered the entire facility through direct radiation measurements, removable contamination swipes and an ambient gamma exposure survey.<sup>3</sup>
  - Maximum direct alpha radiation: 11 dpm/100cm<sup>2</sup> (limit is 5,000 dpm/100cm<sup>2</sup>). Maximum direct beta radiation: 961 dpm/100cm<sup>2</sup> (limit is 5,000 dpm/100cm<sup>2</sup>).
  - Maximum removable alpha: 5 dpm/100cm<sup>2</sup> (limit is 1,000 dpm/100cm<sup>2</sup>).
  - Maximum removable beta: 25 dpm/100cm<sup>2</sup> (limit is 1,000 dpm/100cm<sup>2</sup>).
  - Maximum ambient gamma: 15.7  $\mu\text{R/hr}$ .
  - Background: 13.3  $\mu\text{R/hr}$ .
  - Acceptable limit: 5.0  $\mu\text{R/hr}$  above background.
  - The survey concluded that Building 4019 met the unrestricted use criteria approved by DOE and DHS.

- In 1998, ORISE performed a supplementary verification survey to evaluate the shortcomings found in 1996. The survey covered Buildings 4019 and 4024 through surface scans, surface activity level measurements, and exposure rate measurements.<sup>6</sup>
  - Total surface activity levels ranged from 14 to 43 dpm/100cm<sup>2</sup> alpha (limit is 5,000 dpm/100cm<sup>2</sup>) and -190 to 550 dpm/100cm<sup>2</sup> beta (limit is 5,000 dpm/100cm<sup>2</sup>).
  - Removable activity levels were all less than the minimum detection concentration levels of 9 dpm/100cm<sup>2</sup> alpha and 12 beta dpm/100cm<sup>2</sup>.
  - The ambient gamma exposure rate measured within the vault was 12 µR/hr compared to a background level of 8 µR/hr (limit is 5.0 µR/hr above background).
  - The survey concluded that the facilities met the criteria for release to unrestricted use.
- DHS performed verification sampling in 1998.
- In 2001, EPA conducted an oversight verification survey for alpha, beta, beta-gamma radiation (total and removable) and gamma radiation.<sup>7</sup> Surveys were performed to a quality level equal to a final status survey as defined by the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM). The contaminants of concern were: mixed fission products, uranium, transuranic compounds, and activation and corrosion products. EPA also collected concrete core samples, which were analyzed for photon-emitting isotopes.
  - Acceptable limits for the survey were consistent with NRC regulatory guide 1.86 and the proposed site-wide release criteria as defined in the 1996 Area IV survey.<sup>8</sup>
  - None of the field measurements indicated the presence of radionuclides above acceptable limits.
  - EPA field measurements confirmed the conclusions reached by both Rocketdyne and ORISE.

**Status:**

- In February, 2005 DOE provided a letter to Boeing declaring that Boeing and ORISE surveys had confirmed that DOE and DHS approved cleanup limits had been met, and that Building 4019 was suitable for release for unrestricted use.<sup>9</sup>
- Building 4019 is now inactive.<sup>3</sup>

**References:**

- 1- Phil Rutherford Website, <http://rdweb/shea/radiationsafety/>, accessed August 2003.
- 2- Boeing Document, EID-04374 "Final Report, Decontamination and Dismantlement Operations at SSFL Building 4019 for Release Without Radiological Restrictions," September 11, 1999.
- 3- Boeing Report, RS-00009, "Building 4019, Final Status Survey Report," June 10, 1999.

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- 4- Rocketdyne Report, GEN-ZR-0010, "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," August 26, 1988.
- 5- ORISE Report, 96/C-5, "Verification Survey of Buildings T019 and T024, Santa Susana Field Laboratory, Rockwell International, Ventura County, California," February 1996.
- 6- ORISE Letter, "Addendum to the Verification Survey Report for Buildings T019 and T024, Santa Susana Field Laboratory, Ventura County, California," February 16, 1999.
- 7- U.S. EPA, Contract Number 68-W-02-021, "Final Oversight Verification and Confirmation Radiological Survey Report for Buildings T-011, T-019, T-055, and T-100," December 20, 2002.
- 8- Rocketdyne Document, A4CM-ZR-0011, Rev. A, Area IV Radiological Characterization Survey, August 15, 1996.
- 9- DOE Letter, "Release of Building 4019," from M. Lopez (DOE) to M. Lee (Boeing), February 1, 2005.
- 10- Historical Site Photographs from Boeing Database.
- 11- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4019















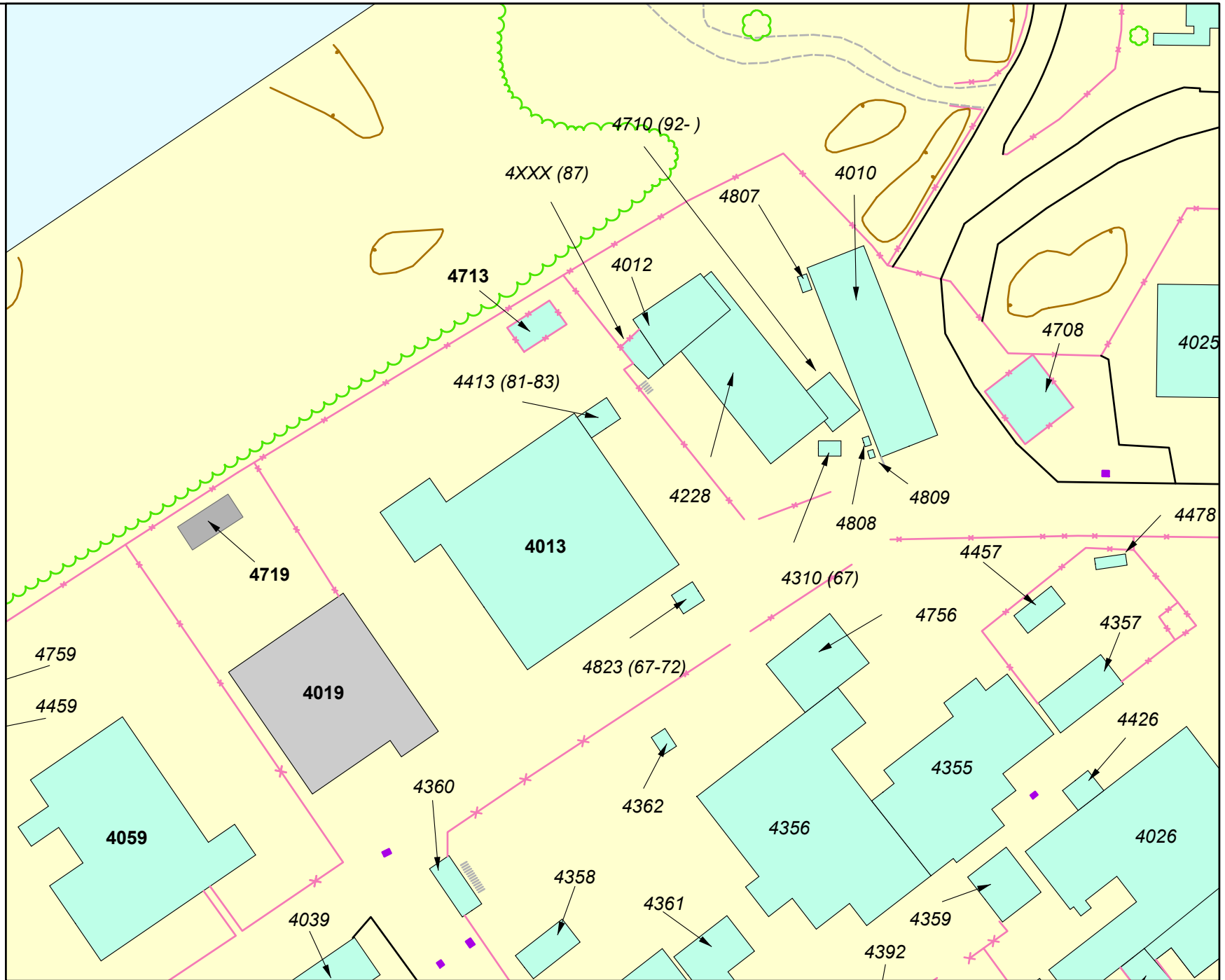
**Legend**

**Labeled Features:**  
(Based on SSFL Documents as of October 2004)

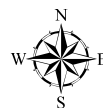
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-  Buildings/Sites: "Demolished"

**Unlabeled Features:**

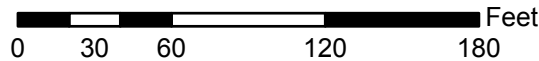
-  Leachfield (Removed)
-  Tree
-  Rock
-  Concrete Curb
-  Gutter
-  Asphalt/Concrete Berm & Paving
-  Sidewalk
-  Dirt Road
-  Fence
-  Stream/Pond
-  Drain
-  Area IV Boundary



DRAWN BY:



1 inch equals 75 feet



DATE:

May 2005

Site Summary Group L

AREA IV

Santa Susana Field Laboratory, CA