Site Summary – Building 4029

Site Identification:

Building 4029
Radioactive Measurement Facility
Old Calibration Facility
Hazardous Waste Storage Facility
Hazardous Waste Management Facility

Operational Use/History:

- Constructed in 1959.
- Originally constructed to store radioactive source materials (i.e., Ra-266, Co-60, PoBe, PuBe and Cs-137) (which were checked annually to ensure no leakage occurred) for instrument calibration.[1]
- All radioactive source materials were removed on April 29, 1974 and the facility was partially decommissioned.[2]
- Following source materials removal, the building became a non-radioactive hazardous materials storage building for alkali metals (Na, NaK, Li, LiH_2) and alkali metal contaminated components.[3]
- In 1988, all below-grade enclosures were removed and disposed of as low level waste, the exhaust system was removed for reuse, and the excavations were backfilled to allow for continued use of the facility.[1]
- DOE released the site without radiological restrictions February 5, 1993.[4]

Site Description

- Building 4029 is a single open bay, Butler-type building with a steel frame, corrugated metal siding and roofing. The building measures 20 x 40 feet with a 12-foot eave height and the ceilings and walls are insulated with fiberglass mat. Three below-grade enclosures were constructed to hold radioactive calibration sources: a 10-foot deep concrete well with three separate galvanized pipe casings for source storage, a 10-foot deep concrete and lead well with a 4-foot above-grade section (14 feet total) with galvanized pipe casing for instrument calibration, and a 3 x 3 feet concrete pit 2 feet deep for source storage.[1, 3]

Relevant Site Information:

- Some barrels with unknown contents (assumed to be non-radioactive) were stored outside the building for a short period of time in the early 1960s. Later surveys found no detectable activity at the storage area.[3]
- Two reported incidents may have resulted in potential releases to the environment:

- On March 24, 1964, a leaking calibration source contaminated the building and personnel with 24.8 mCi Ra-226; the contamination was primarily confined to the source storage well and the source thimble. The area outside the source holder was decontaminated and surveyed, and the damaged source was removed and sealed to prevent further leakage (A0032).
- On January 20, 1970, the encapsulation of a 4.6 Ci Cs-137 calibration source failed during use, resulting in the source getting stuck in the storage well. It was estimated that external radiation level of the source was 16 R/hr one foot away from the source (A0577).

Radiological Surveys:

- Rocketdyne performed a Radiological Survey in 1988 measuring the gamma exposure rate of the building, surrounding area and entrance road to clarify and identify areas needing further radiological inspection or requiring remedial action.[3]
  - Average gamma: 14.4 ± 1.55 µR/hr. (–0.84 ± 1.55 µR/hr corrected for background)
    - DOE limit: 20 µR/h above background.
    - Nuclear Regulatory Commission (NRC) limit: 5 µR/hr above background.
    - Survey results were below the acceptable limits.
  - Source wells were contaminated (2,800 α-dpm/100 cm^2) and it was recommended that they be remediated during the final decommissioning and demolition (D&D) of the facility.
  - The survey concluded that with the exception of the wells, the facility is clean of any residual radioactive contamination.
- DHS performed verification sampling in 1995.
- Rocketdyne took soil samples as part of the D&D effort and the survey results are documented in the 1996 Final D&D Report.[1]
  - The survey found all radiation to be in acceptable ranges around background levels:
    - Excavation results for Pb-214 were 0.28 and 0.27 pCi/g compared to a background measurement of 0.84 pCi/g.
    - Excavation results for K-40 were 23.1 and 23.6 pCi/g compared to a background measurement of 22.2 pCi/g.
  - Based on these measurements and the 1988 radiological survey, the facility was released for unrestricted use.
- ORISE performed an Independent Verification Survey in 1993.[4]
  - The survey consisted of surface scans for elevated direct radiation. Results of the survey did not indicate any locations of elevated direct radiation using the NRC limit of 5 µR/hr (DOE limit is 20 µR/hr above background).[4]
  - Based on these findings ORISE recommended that the facility be released without radiological restrictions.

- EPA conducted an oversight verification survey in 2001 for alpha and beta contamination.[5] The survey included scans for alpha and beta and fixed point measurements for alpha and beta. Six swipe samples were collected and dust samples were collected from two ventilation ducts. Swipe samples were analyzed for removable contamination and dust samples were analyzed for the presence of radium daughter products. The contaminant of concern (COC) for Building 4029 was Ra-226 on the floors and walls.
    - Acceptable limits for the survey were consistent with NRC Regulatory Guide 1.86 (Ra-226 levels of 100 dpm/100 cm^2 average, 300 dpm/100 cm^2. maximum and 20 dpm/100 cm^2 removable) and the proposed sitewide release criteria in accordance with Area IV survey.[6]
    - None of the field measurements indicated the presence of radionuclides above acceptable limits.
    - The Environmental Protection Agency (EPA) field measurements confirmed the conclusions reached by both Rocketdyne and ORISE.

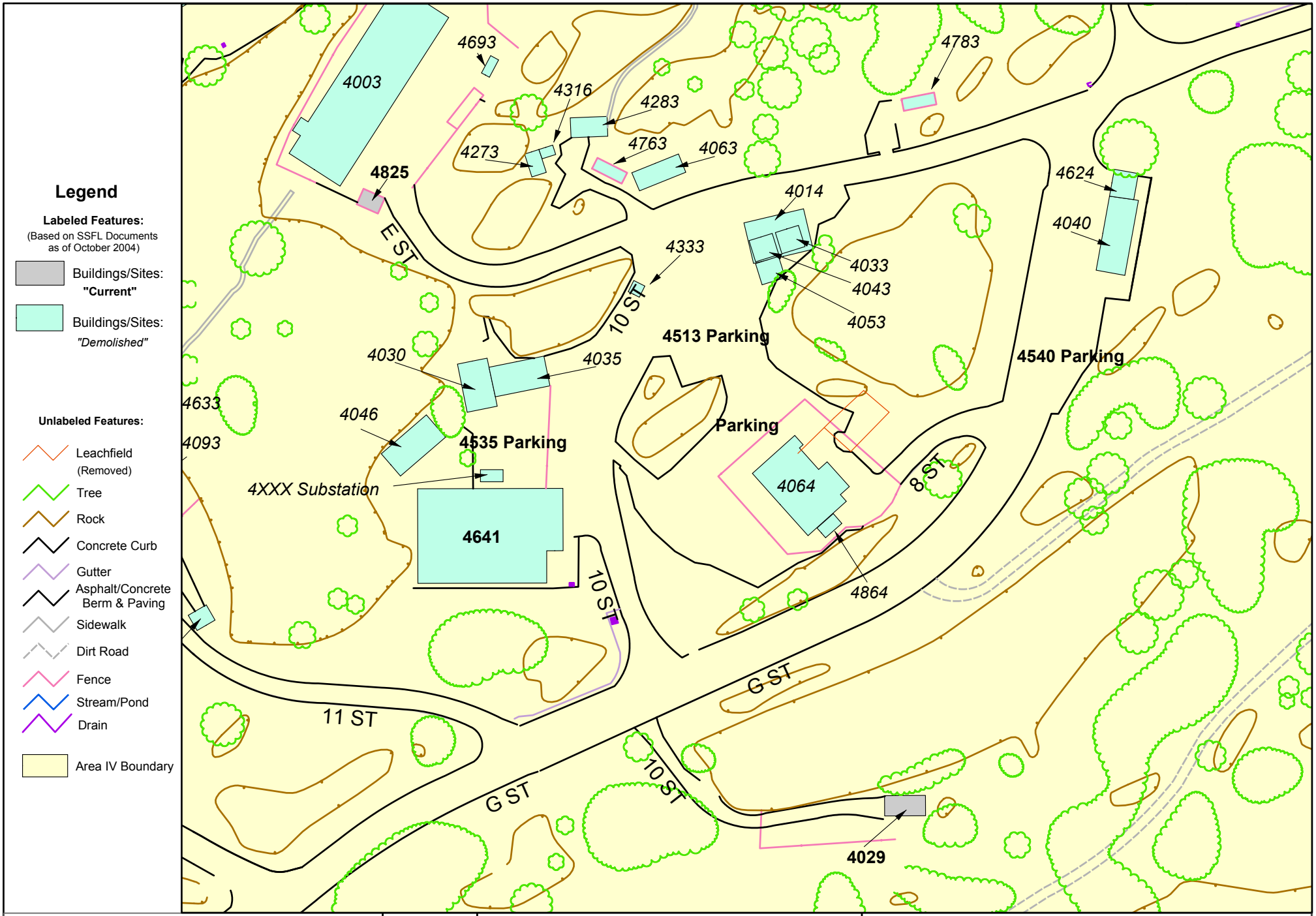
Status:

- DHS concurred that Building 4029 met the approved standards for unrestricted release on December 21, 1995.
- DOE released Building 4029 without radiological restrictions on April 21, 1997.[4]
- Building 4029 is currently used to store non-radioactive hazardous materials prior to disposal.[4]

References:

1- ETEC Document, 029-AR-0001, “Final D&D Report for Building T029,” March 28, 1996.
2- Rockwell Health and Safety, Letter, “Transfer of Radioactive Sources from T029,” from J. D. Moore (Rockwell Health and Safety) to W. F. Heine, May 1, 1974.
3- ETEC Document, GEN-ZR-0006, “Radiological Survey of the Old Calibration Facility – Building T029,” August 19, 1988.
4- ORISE, Letter, “Type A Verification of Building T029, Santa Susana Field Laboratory, Rockwell International, Canoga Park, California,” from T. Vitkus (ORISE) to A. Kluk, February 5, 1993.
5- U.S. EPA Report, no document number, “Final Oversight Verification and Confirmation Radiological Survey Report for Buildings T-012, T-029, and T-363,” December 20, 2002.
6- Rocketdyne Document, A4CM-ZR-0011, Rev. A, “Area IV Radiological Characterization Survey,” August 15, 1996.
7- Historical Site Photographs from Boeing Database.
8- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4029


Legend
Labeled Features:
(Based on SSFL Documents as of October 2004)
Buildings/Sites: "Current"
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
4003
4693
4316
4283
4783
4273
4763
4063
4825
4624
4014
4040
4333
4033
4043
4053
4513 Parking
4540 Parking
4030
4035
4633
4046
4093
4535 Parking
Parking
4064
4XXX Substation
4641
4864
4029
E ST
10 ST
8 ST
11 ST
G ST
DRAWN BY:
Sapere CONSULTING INC
DATE:
May 2005
N
W
E
S
1 inch equals 125 feet
0 50 100 200 300
Feet
Site Summary Group E
AREA IV
Santa Susana Field Laboratory, CA