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Abstract

This document presents information supporting release of SSFL Building 4019 without radiological restrictions.

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1.0 INTRODUCTION

Building 4019, a former nuclear facility at the Santa Susana Field Laboratory (SSFL) is a 6400 ft^2 building with steel framing, siding and built-up roof on a reinforced concrete slab. The building has a 10-ft height Low Bay containing office areas, a conference room, a restroom and an equipment room. Connected to the Low Bay is a 32-ft height High Bay containing open floor space, a 10-ton bridge crane, an empty storage room with cinder block walls and a below-grade test vault with hydraulic lift.

This report documents the decontamination and dismantlement (D&D) activities conducted in the Building 4019 High Bay, test vault, storage room and equipment room supporting the eventual release of the building for unrestricted use. Section 2 provides background on the facility. Section 3 overviews the D&D activities while Section 4 provides details of the most recent activities. Section 5 and 6 provide waste generation and cost summaries, respectively. Section 7 contains the references.

2.0 BACKGROUND

2.1 LOCATION

Building 4019 is part of Rocketdyne's Santa Susana Field Laboratory (SSFL) in the Simi Hills of southeastern Ventura County, California, adjacent to the Los Angeles County Line and approximately 29 miles northwest of downtown Los Angeles. **Figure 2-1** shows the location of the SSFL relative to the surrounding communities. Building 4019 is located in Area IV, which comprises the western portion of the SSFL in an area known as Burro Flats. This is indicated in **Figure 2-2**, a portion of the 1967 edition of the U.S. Geological Survey Calabasas Quadrangle topographic map. **Figure 2-3** is an aerial photograph of Area IV, showing Building 4019 and the surrounding buildings as they appeared in the mid-1960's. Building 4019 , as were many of the Area IV buildings, was built in the early 1960's to support the Atomic Energy Commission (AEC) Systems for Nuclear Auxiliary Power (SNAP) program.

2.2 FACILITY CHARACTERISTICS

Figures 2-4 through **2-13** are various views of Building 4019 as it appears today. The Low Bay conference room, offices and restroom are currently used to support Boeing employee training courses. The High Bay is being used as an indoor storage area. The test vault has prospects for future simulated space environment tests using the vacuum chamber and equipment currently stored in the backyard. The vacuum chamber and equipment is planned to be lowered into the test vault for storage after the hydraulic lift fluid is changed out with non-PCB containing fluid.

Figures 2-14, 2-15 and **2-16** are the elevation drawing, plan drawing and section drawing, respectively, of Building 4019 as it was built.

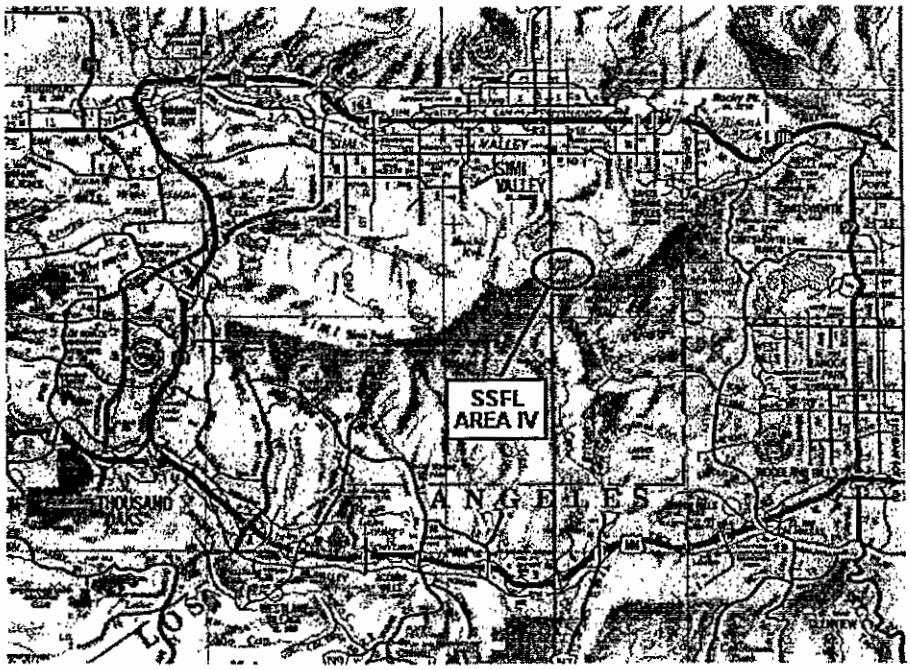

Figure 2-1. Map of Southeastern Ventura County Showing the Location of the SSFL

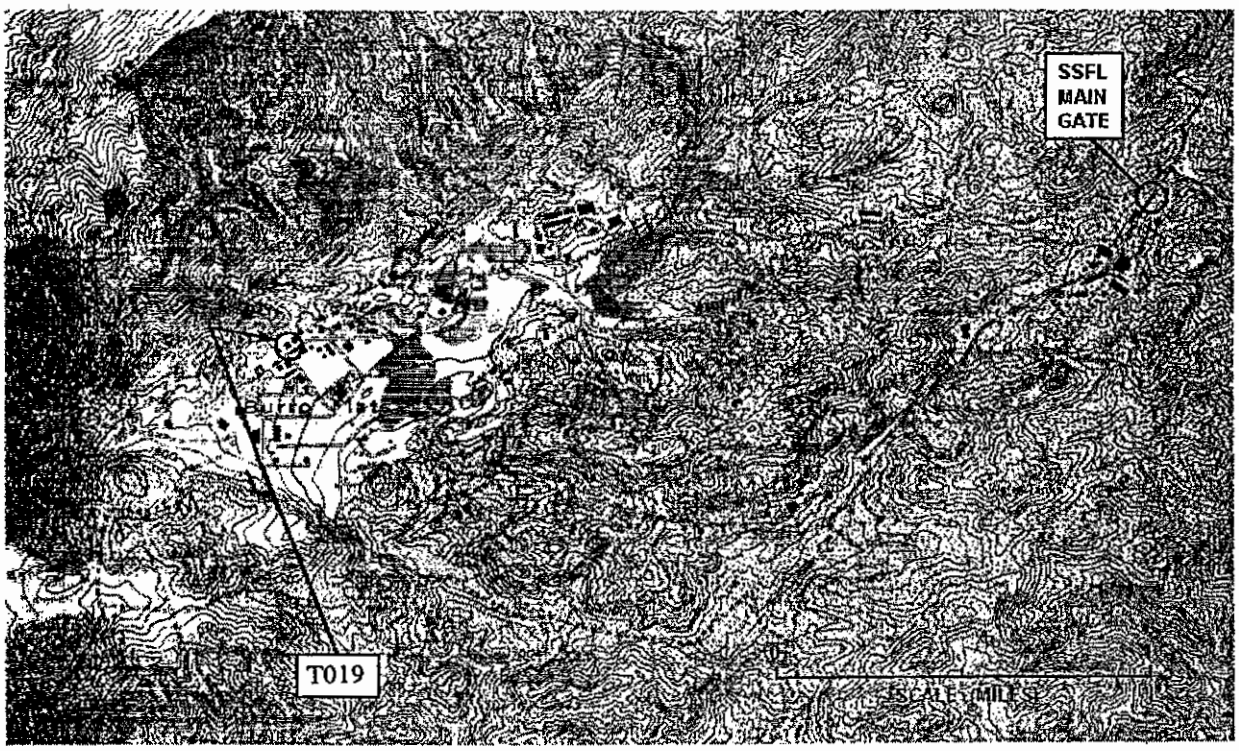

Figure 2-2. Topographic Map for the Area Encompassing the SSFL, Showing the Location of Building 4019

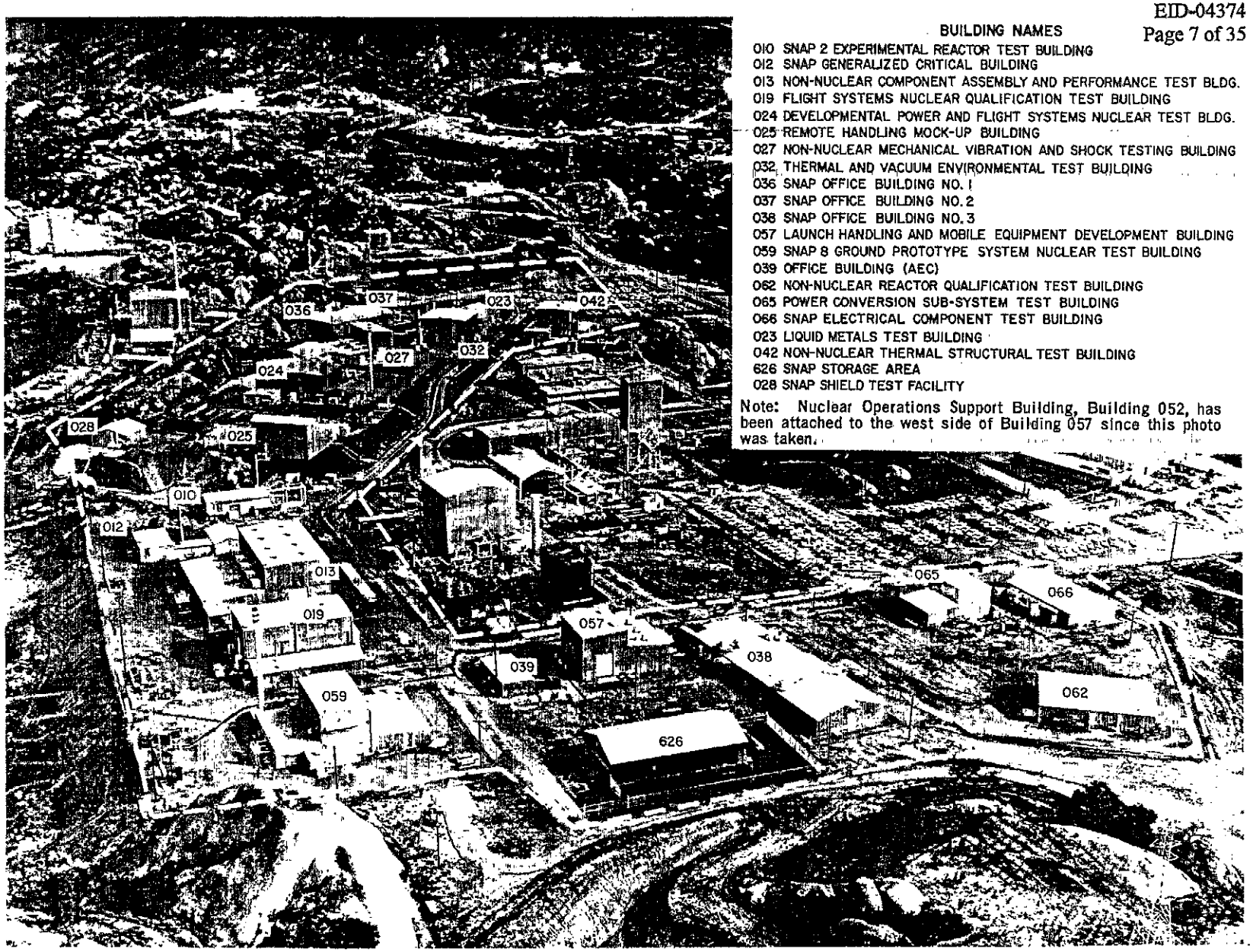

Figure 2-3. Mid-1960's SNAP Building Complex, Looking East

Figure 2-4. Building 4019 Exterior, Looking North

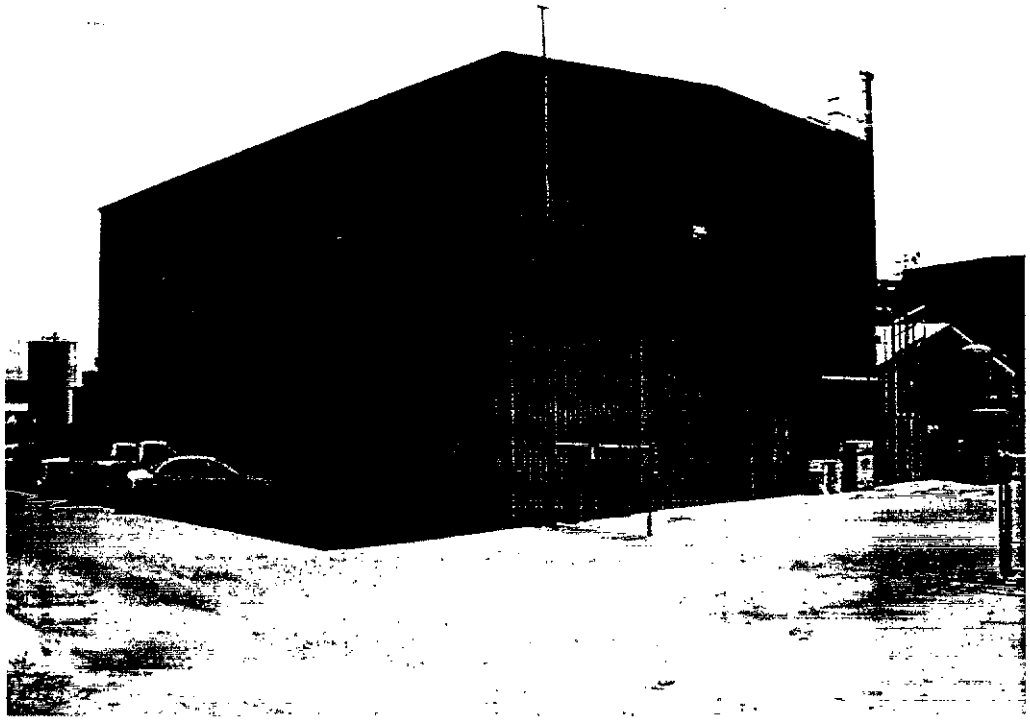

Figure 2-5. Building 4019 Exterior, Looking Southwest

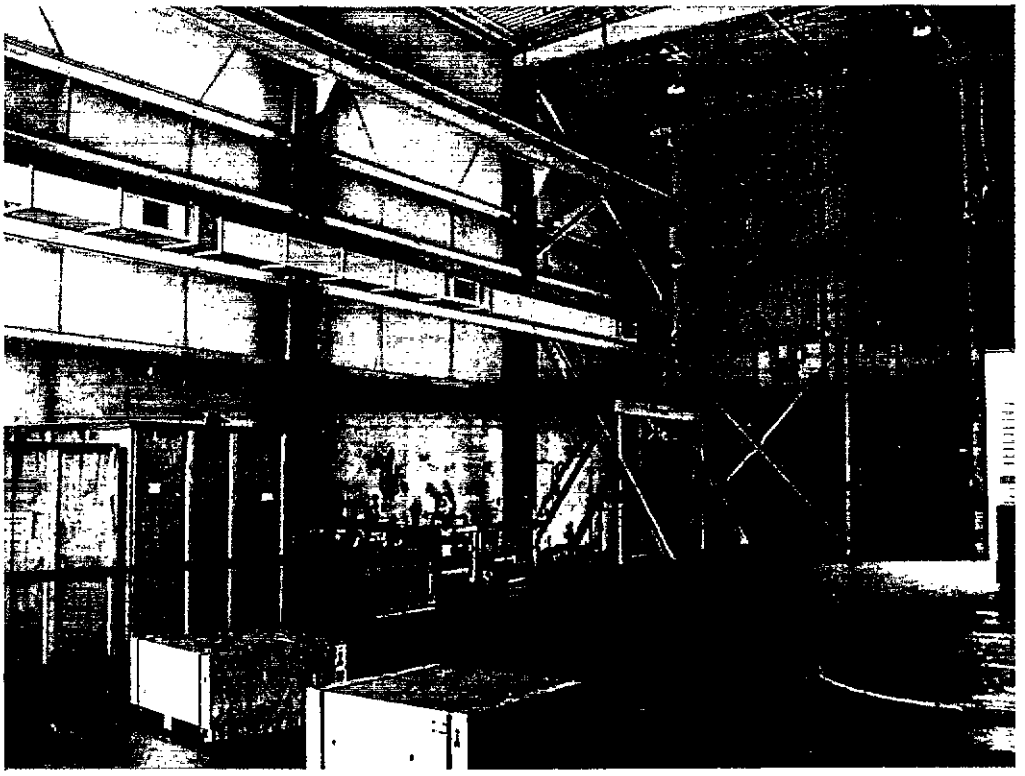

Figure 2-6. Building 4019 High Bay, Looking Southeast

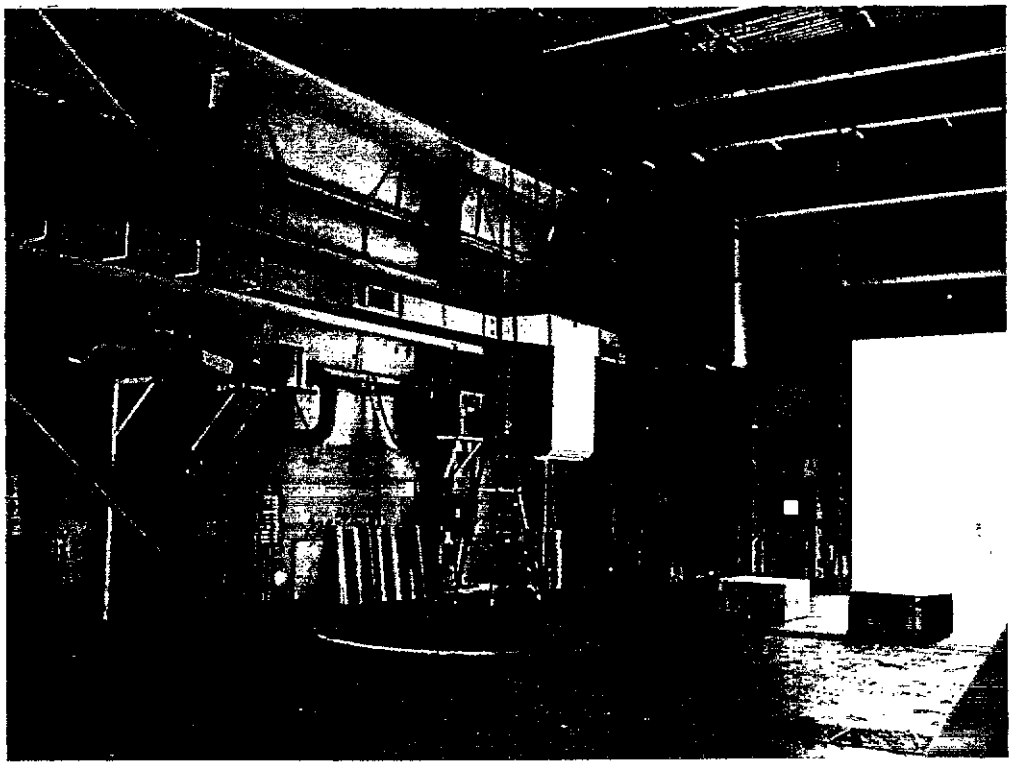

Figure 2-7. Building 4019 High Bay, Looking Northwest

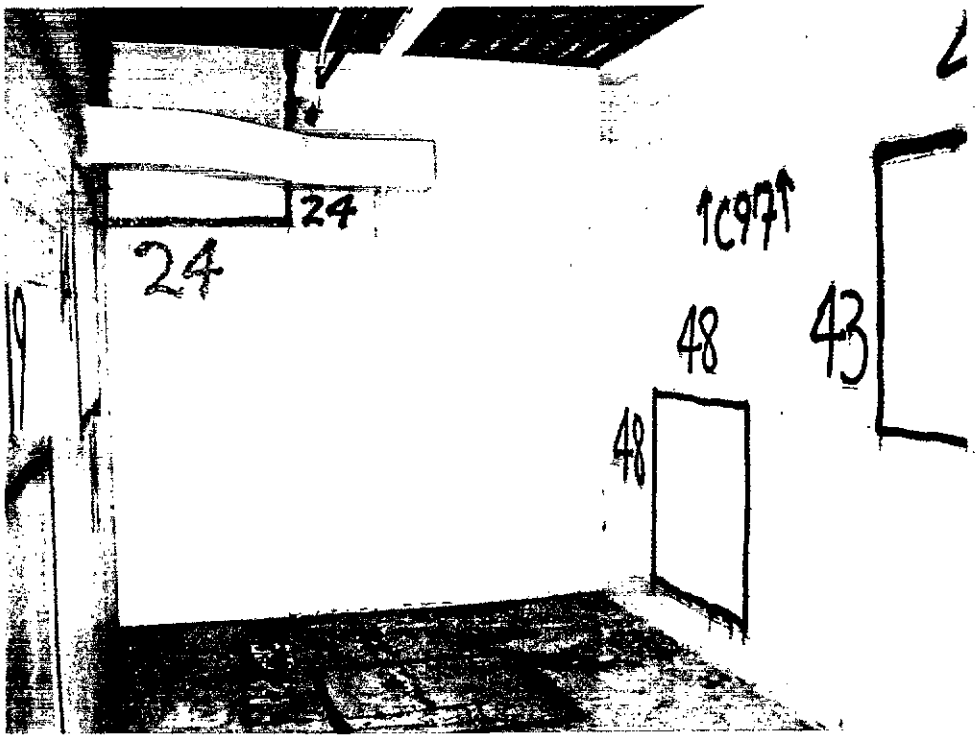

Figure 2-8. Building 4019 Storage Room

Figure 2-9. Building 4019 Test Vault

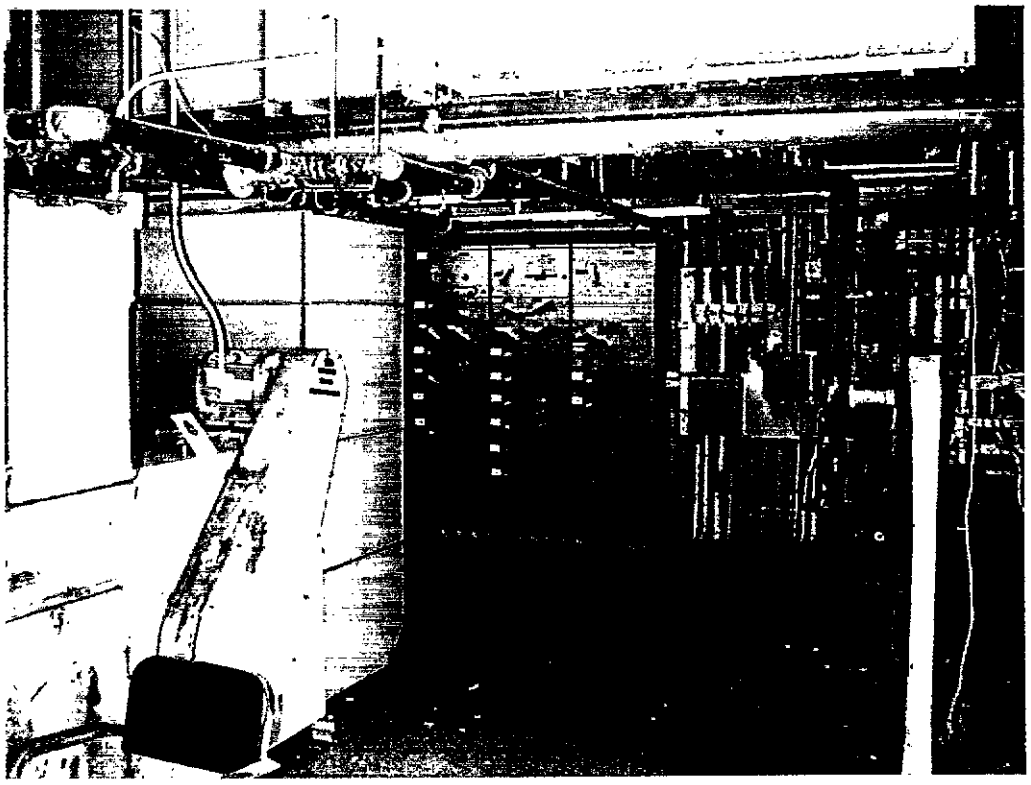

Figure 2-10. Building 4019 Equipment Room

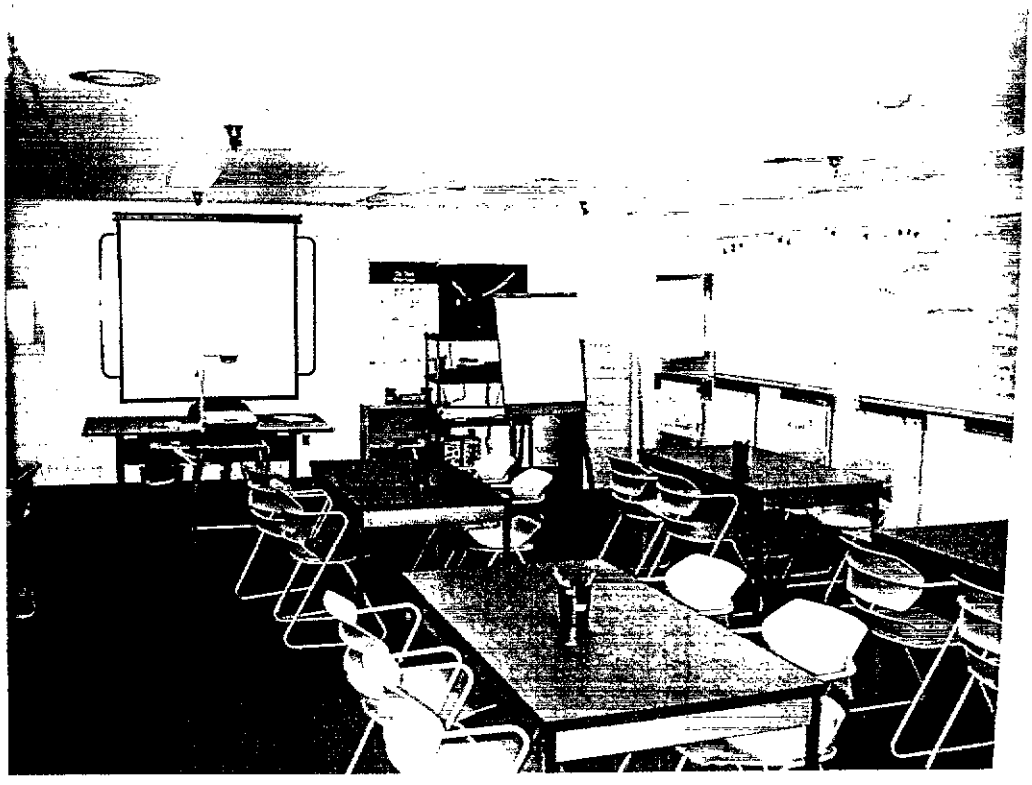

Figure 2-11. Building 4019 Conference Room

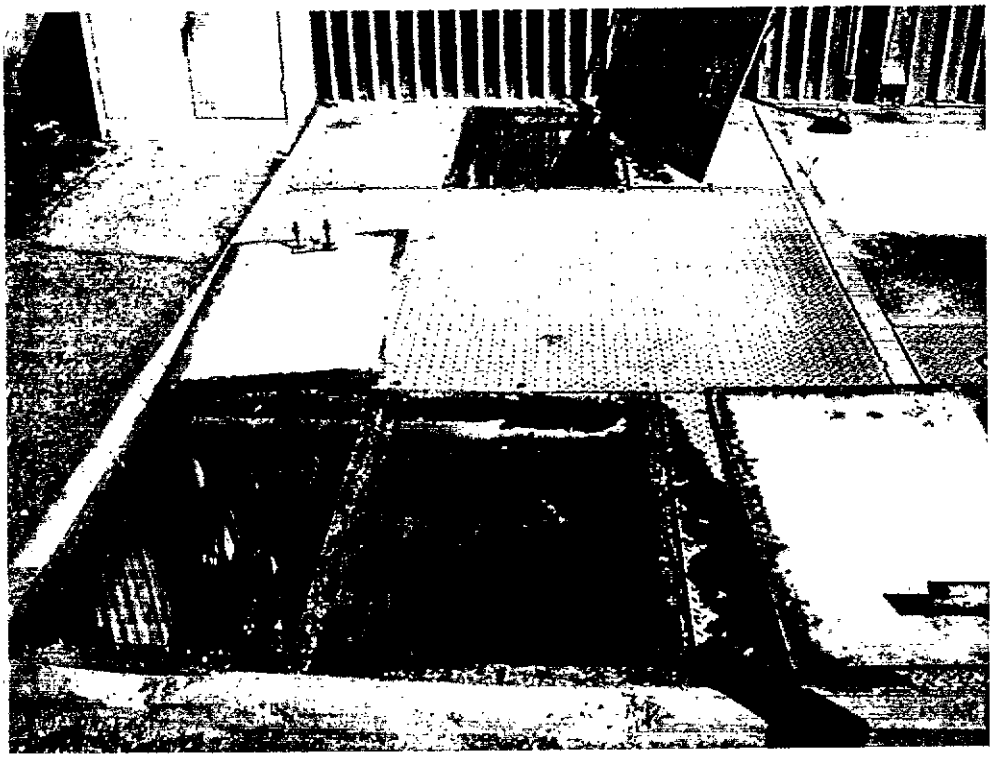

Figure 2-12. Building 4019 Waste Survey Tank

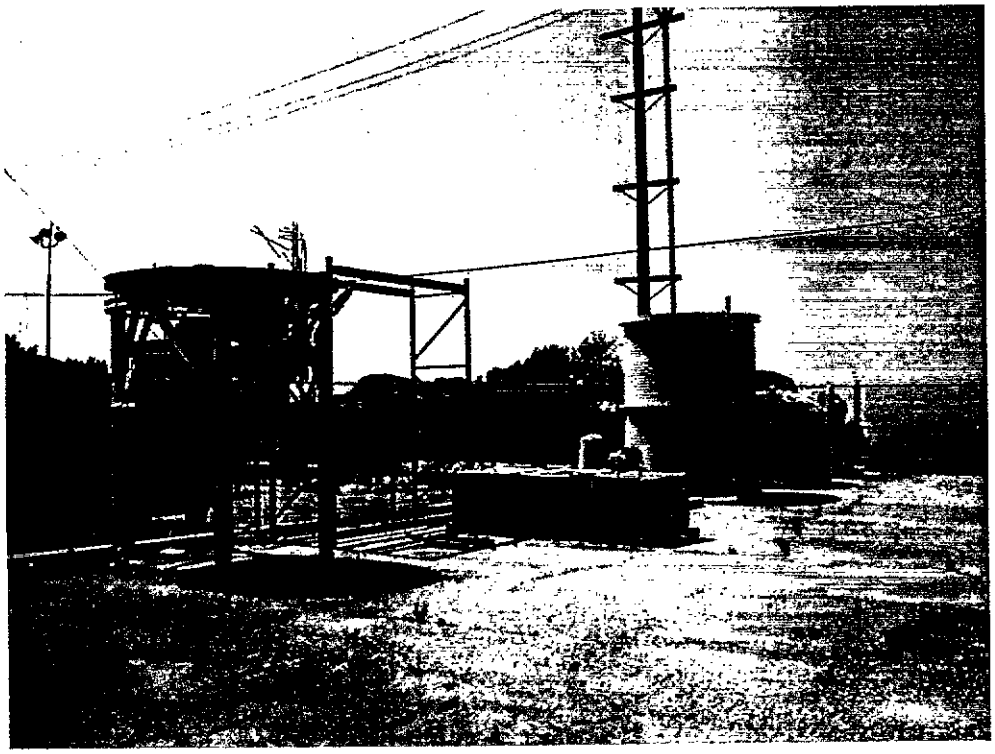

Figure 2-13. Building 4019 Test Vault Vacuum Chamber Equipment

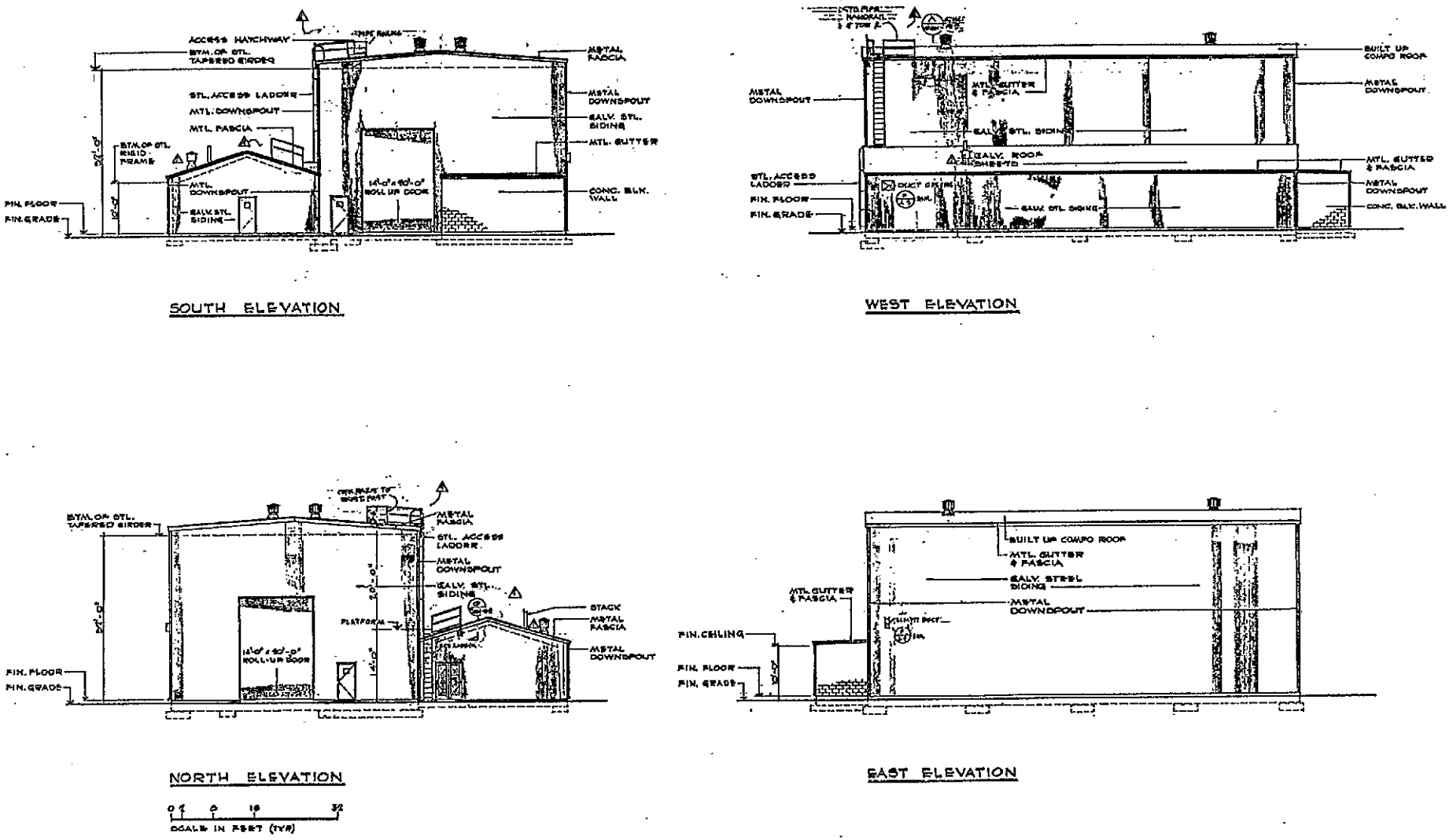

Figure 2-14. As-Built Elevation Drawings Building 4019

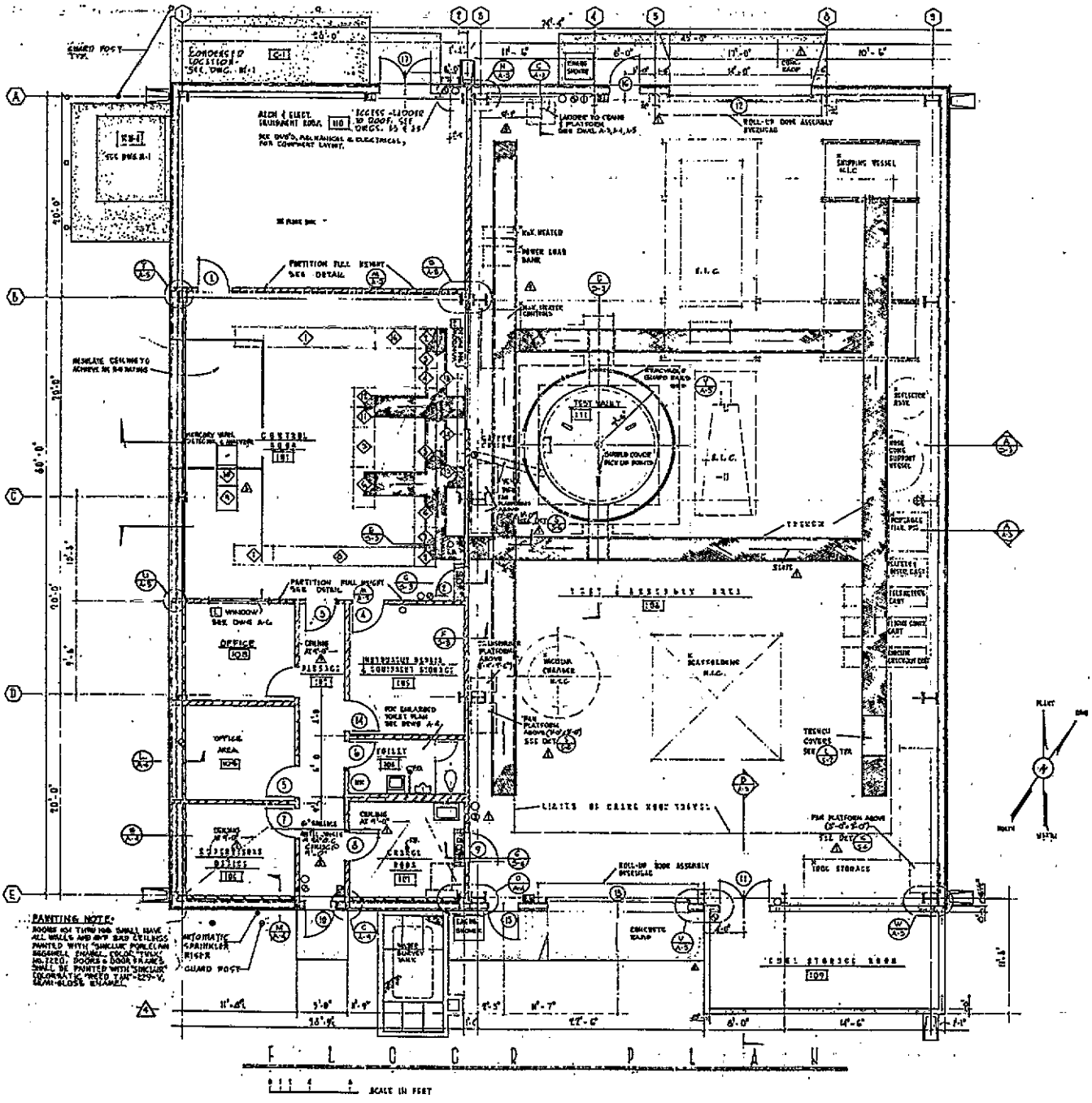

Figure 2-15. As-Built Plan Drawing Building 4019

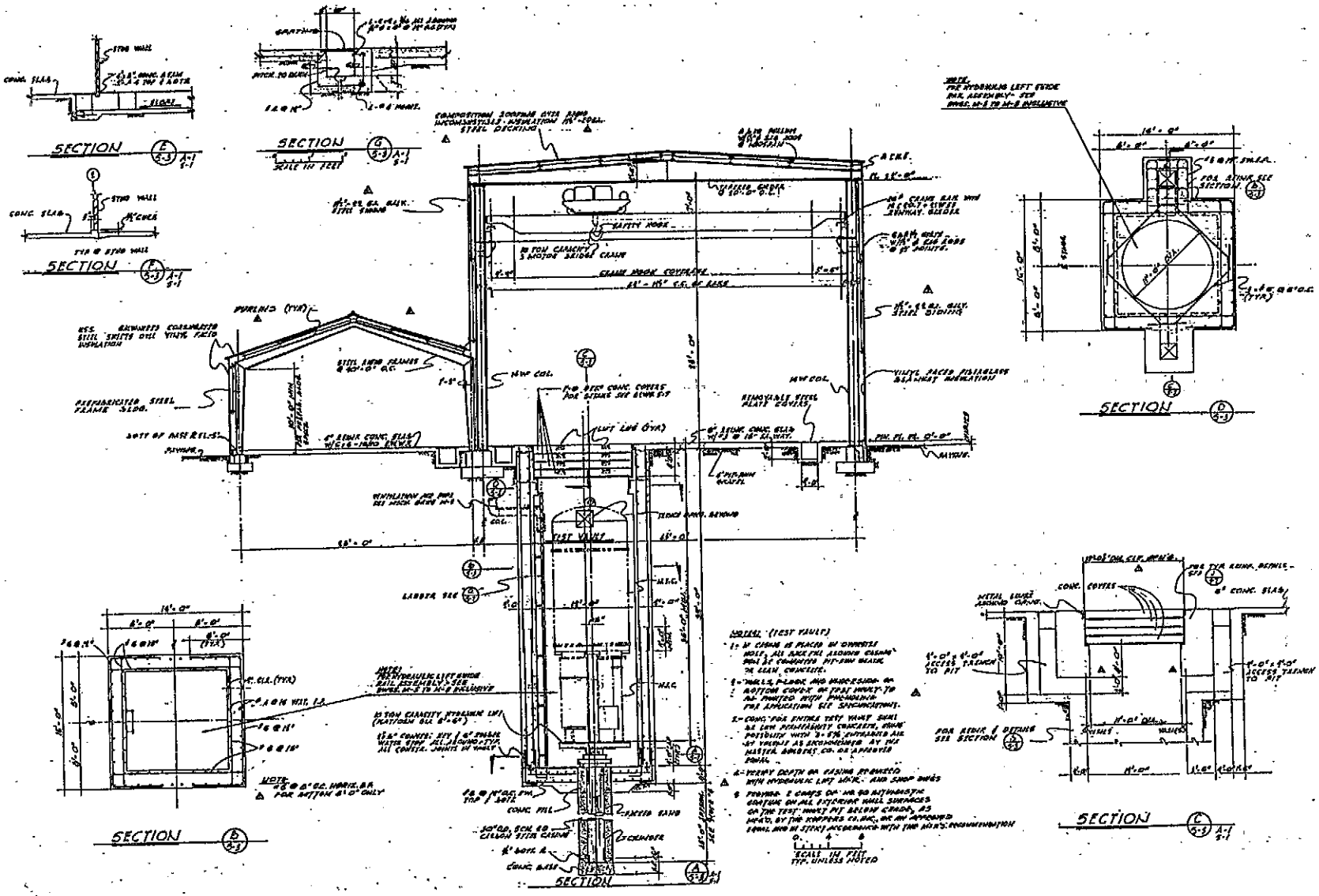

Figure 2-16. As-Built Section Drawing Building 4019

2.3 OPERATIONAL HISTORY

According to Reference 1, Building 4019 was built in 1962 to be the SNAP Flight Systems Nuclear Qualification Test Building. The Low Bay contained the control room, personnel change room, equipment room, restroom and offices. The High Bay contained the final assembly and test area used for acceptance tests in 1964 and 1965 on three SNAP 10A flight systems, FS-1, FS-4 and FS-5.

For each flight system, the Building 4019 involvement began after transferring the flight system from the pre-assembly area in Building 4013 into the 4019 High Bay.

Figure 2-17 is a schematic of a typical SNAP 10A flight system. **Figure 2-18** is a photograph of Flight System FS-4 on top of the hydraulic lift inside the test vault. FS-4 was the flight system that was eventually launched into space as a flight demonstration on April 3, 1965. The SNAP 10A flight systems were designed to be remotely started once in orbit and operate one year. They would provide 40kW-thermal / 400W- electrical power using a NaK-cooled nuclear reactor and SiGe thermoelectric conversion system.

Scaffolding was erected near the southern end of the Building 4019 High Bay that would allow workers easy access when the flight system was in its upright position. There was also a laydown location near the test vault that permitted steps of the final assembly and post-test disassembly to be conducted in the horizontal orientation.

Fuel and reflector assemblies from the Building 4019 storage room were installed into the flight system. NaK, control and instrument lines would be attached and non-nuclear systems would be checked out. The vacuum chamber, without the top cover, was then lowered over the flight system and attached to the lower flange interface. The hydraulic lift was then used to lower the partially assembled test configuration into the test vault for final test preparations. Eventually the beryllium control drums were installed and reactor core fuel loading initiated and continued until dry criticality could be achieved.

The concrete cover plugs were then put in place over the test vault and the control drums calibrated (adjusted) under dry criticality zero-load conditions. The reactor was then shutdown, the concrete plugs were removed and the reactor core fuel loading continued to completion. The reactor vessel end and thermoelectric pump were then welded into the flight system. The flight system was then filled with NaK, the NaK circulated and cleaned, and finally the expansion compensator welded on, providing a closed NaK system. Following further non-nuclear checkouts, the vacuum chamber top cover was attached and the flight system was lowered into the test vault and the vacuum pumping system activated and checked out. Eventually the concrete cover plugs were put in place and wet criticality zero-power tests conducted and the reflector control drums fine adjusted.

The flight system was then removed from the vacuum chamber and the reflector assembly replaced by a safety shutdown sleeve. The flight system was then placed in inert gas-filled containers for shipment to the launch site or storage. Reflector assemblies were shipped or stored in separate containers.

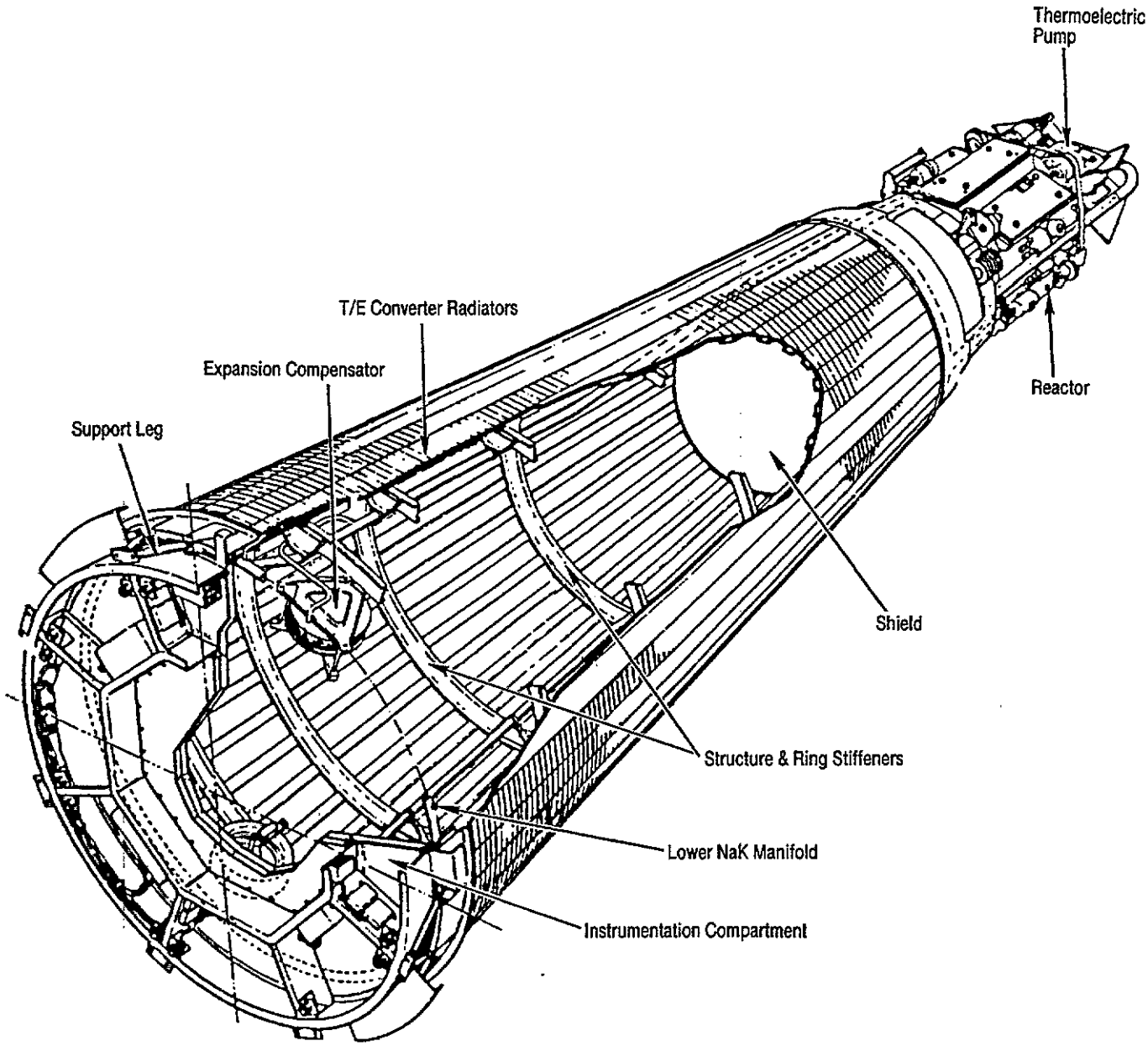

Figure 2-17. SNAP 10A Flight System

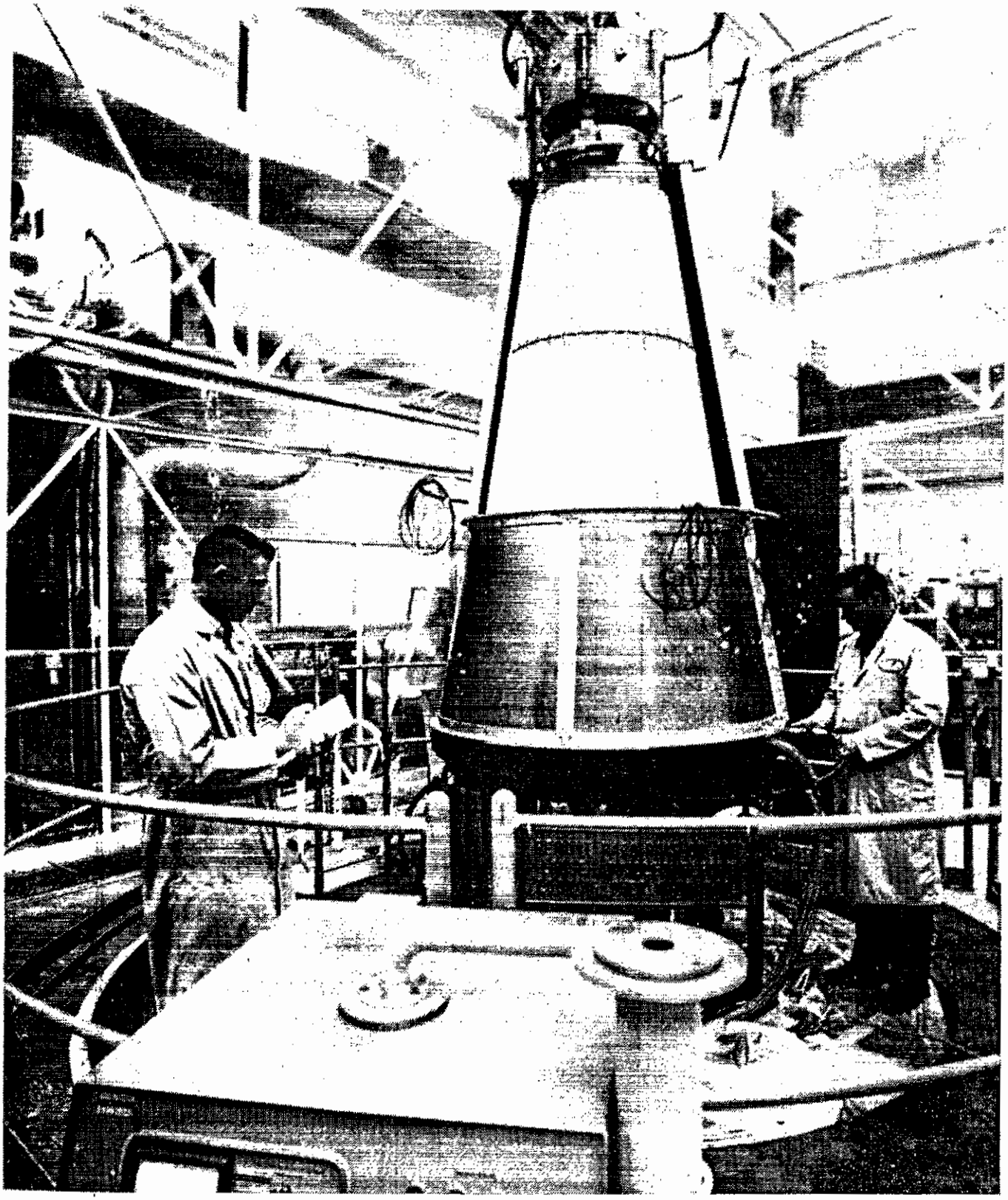

Figure 2-18. SNAP 10A FS-4 in Acceptance Testing

The total time spent by any flight system in Building 4019 was less than 4 months, and the reactor operation was less than 16 hours total for any flight system. The radiation exposure to the test facility during testing and from the fission products remaining in the flight systems after the tests and before removal from the facility was minor.

The SNAP program was terminated in 1970. There were no reported incidences involving nuclear materials or releases at or in Building 4019. Furthermore, when Building 4019 was reassigned for non-nuclear use (circa 1970), radiological surveys were performed to ensure that the area was safe for unrestricted use.

3.0 SUMMARY

Rocketdyne radiological surveys of Building 4019 were conducted in 1988 that concluded the building was uncontaminated and could be released from radiological controls (Reference 2). In 1995, the Environmental Survey and Site Assessment Program (ESSAP) of the Oak Ridge Institute for Science and Education (ORISE) conducted a verification survey of Building 4019 and found a $1m^2$ area on the High Bay floor that had an average surface activity slightly in excess of DOE guidelines for release without radiological restrictions (Reference 4). ORISE also did not survey the test vault. In the summer of 1998, Rocketdyne/Boeing performed D&D activities in Building 4019 and a final radiological survey was conducted that concluded Building 4019 is suitable for release without radiological restrictions (Reference 11). ORISE conducted a reverification of Building 4019 in September 1998 and all measured surface activity and exposure rates met applicable guidelines for release without radiological restrictions (Reference 12).

At this time, the only known hazards in Building 4019 are asbestos containing insulation in the equipment room and (Polychlorinated Biphenyl – PCB) containing fluid in the test vault's hydraulic lift system. In 1999, it is planned to propose a project to DOE to obtain funds to reduce these hazards to the acceptance levels required for unrestricted use.

4.0 PROJECT ACTIVITIES/RESULTS

4.1 RECENT D&D AND SURVEY ACTIVITIES

In 1988, Rocketdyne conducted a radiological survey of Building 4019 (Reference 2). It consisted of a walk-through survey for gamma exposure rate with planned surface smear samples and beta surface activity surveys if radioactive contamination was indicated. 67 locations were surveyed for gamma exposure rates including direct beta contamination measurements. Reference 2 concluded that Building 4019 was uncontaminated and no further investigation was required. Subsequently, Building 4019 was released by Rocketdyne from radiological controls and it was designated the ETEC Construction Staging and Computer Facility.

In 1995, ORISE conducted a verification survey of various SSFL locations including Building 4019 (Reference 4). The survey found that Building 4019 met the Rocketdyne exposure rate limit of 5 μR/hr above background levels. The survey also found that the total and removable alpha and beta activity levels at 44 single point surface locations **(see Figure 4-3)** were below DOE guidelines on maximum values, as summarized in **Table 4-1**. The closest reading to the guideline value of 15,000 dpm/100cm^2 was 11,000 dpm/100 cm^2. This location was between the test vault and South door. However, the average surface activity in the surrounding 1 m^2 at this measurement location was 5900 dpm/100cm^2 which exceeded the DOE guideline of 5000 dpm/100cm^2.

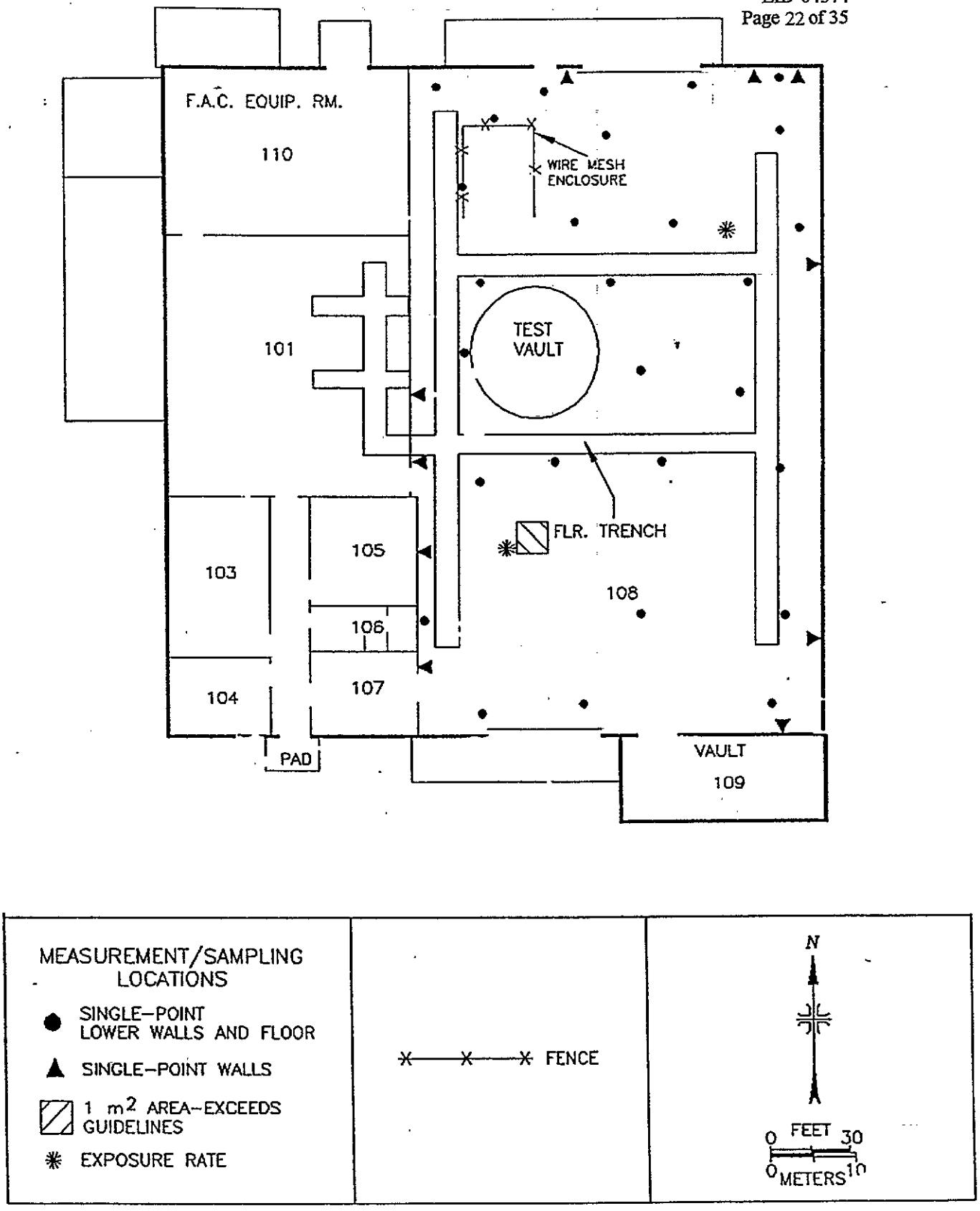

Figure 4-1. 1996 ORISE Building 4019 Verification Survey Map

Table 4-1. Summary of Surface Activity Levels Building 4019 (1996 ORISE, Reference 4)

Location[a]	Number Of Measurement Locations	Total Activity Range (dpm/100 cm²)		Removable Activity Range (dpm/100 cm²)	
		Single Measurement			
	Single-Pt.	Alpha[b]	Beta[c]	Alpha[d]	Beta[e]
T019					
Floor	34	<55	<1,400 - 11,000[f]	<12	<16
Lower Wall	10	<55	<1,000 - 1,400	<12	<16

[a]Refer to Figures 3 and 4.
[b]Guidelines = 5,000 α dpm/100 cm² average in a 1 m² area and 15,000 α dpm/100 cm² maximum.
[c]Guidelines = 5,000 β-γ dpm/100 cm² average in a 1 m² area and 15,000 β-γ dpm/100 cm² maximum.
[d]Guidelines = 1,000 γ dpm/100 cm² average in a 1 m² area and 15,000 α dpm/100 cm² maximum.
[e]Guidelines = 1,000 β-γ dpm/100 cm² average in a 1 m² area and 15,000 α dpm/100 cm² maximum.
[f]Average surface activity in the surrounding 1 m² at this measurement location was 5,900 dpm/100 cm².

There were also a number of deficiencies identified by ORISE in Rocketdyne's prior 1988 documentation (Reference 5). As a result, ORISE was unable to verify Rocketdyne's conclusion that Building 4019 meets the DOE requirements for unrestricted use and recommended that additional D&D and surveys be performed. In addition, due to access difficulties and health and safety concerns, the test vault could not be surveyed by ORISE and therefore the radiological status of the test vault could not be verified.

In June 1997, the test vault cover plugs were removed and a confined space entry was conducted to perform a radiation survey. This survey by Rocketdyne Radiation Safety consisted of taking activity readings, smear samples and material samples at the 16 locations identified in **Figure 4-4**. The activity levels were between 12 and 14 μR/hr at all locations. The smear and material samples had no detectable activity above background levels.

The vacuum chamber and vacuum pump inside the test vault had been removed earlier and in June 1997 a radiation survey of this equipment by Rocketdyne Radiation Safety indicated no unnatural activity.

In 1997, as part of company site wide abatement programs, the asbestos containing roofing materials were replaced by an outside roofing contractor and the peeling leaded paint on the High Bay doors, AC/heating ducts and structural steel was removed by a licensed lead abatement subcontractor.

The latest D&D activities were started in June, 1998. These were the operations required to support final release radiation surveys and ORISE re-verifications.

The operational mission was to remove equipment from the High Bay, storage room and test vault that was obstructive to radiation surveys and to clean oil and dirt films from potentially activated surfaces that could obscure radiation measurements.

The operations were interrupted when it was discovered that the test vault's hydraulic lift fluid contained PCB's. The 40 CFR 761 acceptable level of PCBs is 50 ppm while the hydraulic lift fluid contained 160 ppm. Chemical sampling of free standing liquids and films on the test vault walls and floor indicated a PCB hazard existed inside the test vault. The test vault D&D plan was then modified to first remove free standing liquids and films from the test vault. This would reduce the PCB airborne hazard and segregate the higher concentrations of PCBs from the wastewater planned to be generated from the eventual spray washing of the test vault. Workers were required to wear protective clothing and organic filtered face masks while performing the cleaning operations.

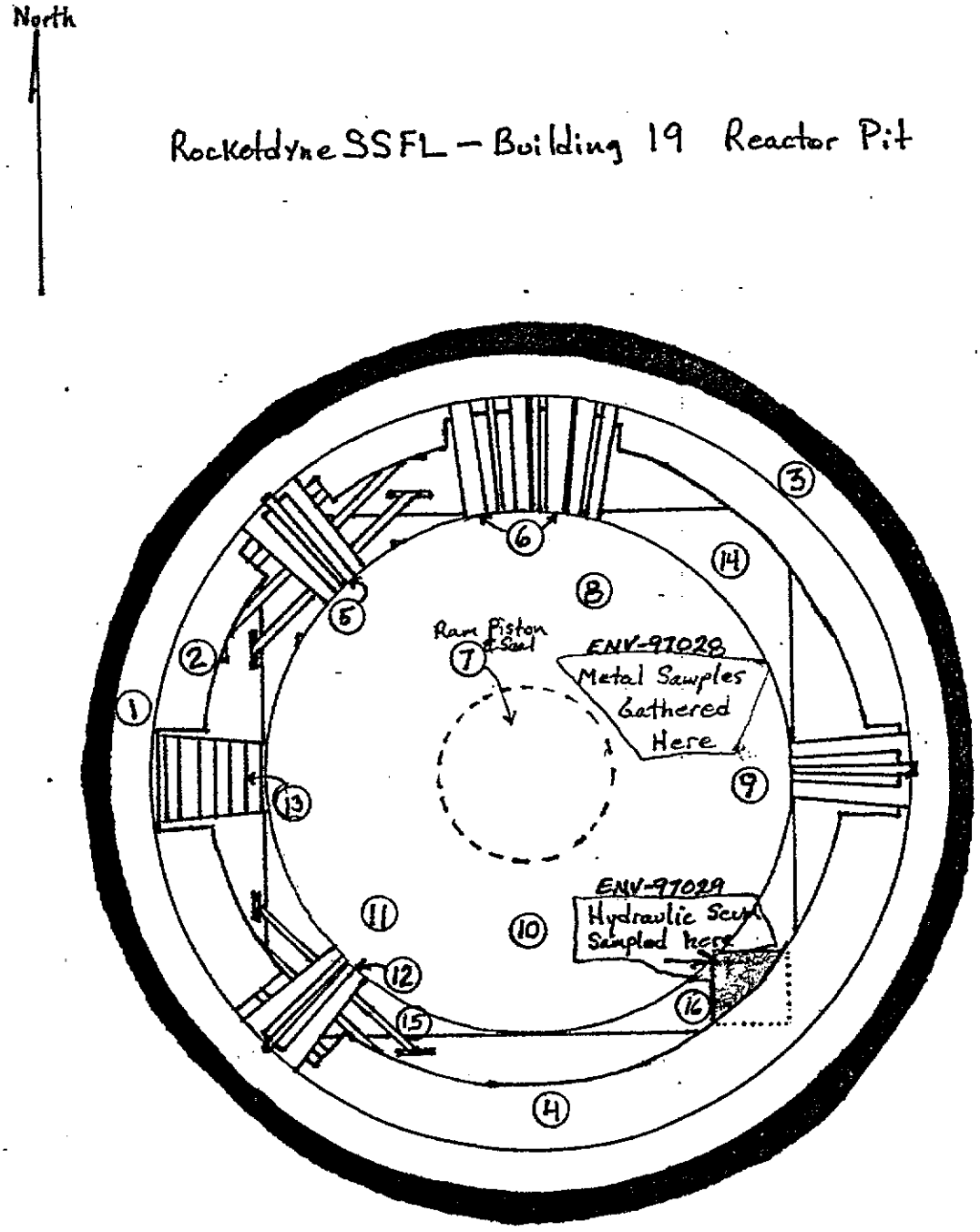

Figure 4-2. 1997 Rocketdyne Survey Map of Building 4019 Test Vault

In July, 1998, Plant Services electricians deactivated all electrical sources to the test vault except for the lighting inside the test vault and the test vault exhaust fan on the west wall of the High Bay. A ground fault interrupt circuit(GFCI) box was established for portable lighting and power tool usage inside the test vault.

An outside asbestos abatement contractor entered the test vault and obtained samples for determination of asbestos content. Analyses indicated that the only asbestos containing materials were small pieces of floor tile that had been in the crack between the cover plugs and High Bay floor slab and had fallen into the test vault when the cover plugs were removed. These were removed by the licensed subcontractor using a HEPA-filtered vacuum.

An extension ladder was welded to the top of the existing test vault entry ladder and outfitted with a center rail system that provided a movable tie-off location the length of the ladder for fall protection equipment.

Seventy one Confined Space Entries into the Building 4019 test vault were conducted per the Reference 6 Confined Space Safe Operating Plan (CSSOP) between July 15, 1998 and October 9, 1998. The initial Confined Space Entries were conducted to clean up a hydraulic lift fluid spill into the pit. An unlabeled small diameter copper tubing bleed line was mistakenly severed during movement of wire bundles in preparation for removal of the deactivated electrical lines. About one gallon of hydraulic lift fluid spilled before the line could be crimped shut. The spilled hydraulic lift fluid outside the test vault was immediately mopped up and a sample of the hydraulic lift fluid sent to Columbia Analytical Services (Reference 7) for analysis. After analysis determined that the hydraulic lift fluid contained PCB's, the spilled hydraulic lift fluid inside the test vault was cleaned up using a double wipe technique and Alchonox cleaning agent. Wipe samples for chemical analysis (per Title 40 CFR 761, Iso-octane solvent used) were then collected at the cleaned areas and throughout the test vault. Chemical analyses by Columbia Analytical Services (Reference 8) indicated that some of the sampled areas remote from the recent spill had PCB levels as high as 620 µg per wipe sample which is well above the Title 40 non-restricted access area cleanup requirement of 10 µg. A representative cleaned area had a wipe sample with PCB level of 7 µg.

The next series of Confined Space Entries rerouted the bleed line and added a double valve system that allowed the hydraulic lift fluid to be removed from the lift cylinder into 55 gallon waste drums on the high bay floor. 6000 pounds of weight was lifted using the facility overhead crane onto the top of the hydraulic lift platform to force the hydraulic lift fluid out of the lift cylinder and into the waste drums. 255 gallons of hydraulic lift fluid were collected and disposed of as hazardous waste. Samples were taken from the hydraulic lift fluid and radionuclide concentrations analysis conducted by Rocketdyne Radiation Safety found no contamination of Cs-137, Co-60, or any other man-made isotope of fuel.

Confined Space Entries were then conducted to cut and remove all electrical lines entering the test vault except for the "hot" lines for the test vault lighting, which had been marked as active. Confined Space Entries were then conducted to double wipe clean the visually most contaminated test vault surfaces, which included the top of the lift platform, the test vault floor and horizontal ledges. Wipes, soiled protective clothing and used respirators were surveyed for radioactive contamination (none detected) and then disposed of as hazardous waste.

The test vault sump cavity contained a viscous black liquid. Failed attempts to sump pump it out of the cavity led to hand bailing it out and then absorbing the residual liquid films with Diatomaceous earth and double wiping the cavity clean. The removed materials were disposed of as hazardous waste.

Physical items were removed from the test vault that would hinder or obscure in-test vault radiation surveys. These items were placed in a holding area in the High Bay for radiation surveys. These items included electrical wiring, pipe insulation, conduit, rubber hoses, copper lines, fasteners and other miscellaneous objects removed from the test vault. After the radiation surveys indicated radiation readings met release criteria, they were size reduced and placed in three wooden crates and are being stored in the back storage yard of Building 4019. An assessment by the Environmental Remediation Department concluded that these items may be disposed of as scrap metal for recycle.

The coolant water line contained glycol and was drained into two 55 gallon drums from its low point in the test vault. 105 gallons of glycol were collected. Samples were drawn from the drums and Rocketdyne Radiation Safety analyses indicated that the liquid contained no unnatural activity. The glycol was disposed of as hazardous waste.

Spray washing of the test vault was conducted on September 5, 1998. A solution of hot water and liquid Alconox was used. 115 gallons of discharge drained into the test vault's sump, which was then pumped into hazardous waste drums. Radiological scanning of these drums indicated they met release criteria and the effluent was disposed of as hazardous waste.

During the D&D process, workers clothing, PPE, wipes, absorbent and miscellaneous equipment became contaminated with PCB's. The total weight of this solid waste was 3,300 pounds, and it was placed in 55 gallon drums and yard boxes and disposed of as hazardous waste.

Rocketdyne Radiation Safety final status surveys of the inside of the test vault began September 8, 1998 and ended September 24, 1998. Twenty two Confined Space Entries were conducted. On September 29, 1998, two Confined Space Entries were conducted by ORISE as part of a re-verification survey of Building 4019. On October 7, 1999, a

Confined Space Entry was conducted as part of a verification survey by the State of California.

On September 12, 1998, during a Confined Space Entry for the Rocketdyne Radiation Safety survey, a burning odor was noticed and the entry was aborted. It was suspected to be overheating of one of the interior light ballasts. An investigation commenced to establish whether there was an airborne hazard from the burnout of a PCB containing light ballast. Confined Space Entries on September 15, 1998 and September 16, 1998 disassembled the lights and investigated the ballasts. All were non-PCB type. The Rocketdyne Radiation Safety Test Vault survey was completed without further incidents.

In parallel with the Building 4019 test vault entries, other D&D operations were conducted. The hydraulic lift fluid reservoirs and pump equipment in the Equipment Room were drained of 85 gallons of hydraulic lift fluid and removed. The hydraulic lift fluid was put into two 55 gallon waste drums and disposed of as hazardous waste.

Holes were drilled into the reservoirs to prevent their reuse as containers and they were moved out of Building 4019 to a holding area where they will be recycled as scrap metal.

A hydraulic lift fluid sample was taken from a low spot in the line that had been attached to the reservoirs. The sample was sent out for chemical analysis using a second column method to clearly confirm the presence of PCBs by eliminating possible interference, which may cause a false positive result. The analysis conducted by Columbia Analytical Services, Inc. (Reference 9) indicated a PCB level of 73 ppm, lower than the earlier sample (Reference 7) but still above the 40 CFR 761 acceptable level of 50 ppm.

The High Bay and storage room were cleared of storage racks containing surplus equipment. The test vault's vacuum chamber and pumps that were being stored in the High Bay were surveyed for radiation, satisfied release criteria and were moved out of the building to the rear storage yard.

The comprehensive Final Status Survey was performed per the procedures provided in Reference 10. This included 100% qualitative survey of all surfaces for surface contamination, 165 quantitative measurements of total alpha & beta surface contamination, 665 smear measurements for removable alpha & beta contamination, and 43 ambient radiation exposure measurements. The results of the survey are provided in Reference 11. All measurements were below the DOE and Department of Health Services (DHS) approved cleanup standards.

On September 29, 1998, ORISE performed a re-verification of Building 4019. The survey (Reference 12) was conducted in accordance with a DOE approved site-specific survey plan (Reference 13). The ORISE survey verified that Building 4019 is suitable for release for unrestricted use.

In October 1999, the DHS Radiologic Health Branch performed a verification survey of Building 4019 and confirmed that the building is suitable for release for unrestricted use.

5.0 WASTE GENERATED AND DISPOSAL

Most of the wastes generated during the later Rocketdyne D&D activities were disposed of as hazardous materials. The liquid wastes generated were the lift fluid with PCBs, the glycol in the water lines and the oily effluent with PCBs from hot water cleaning the test vault. The solid wastes generated were absorbent wipes, PPE, sump pumps, hoses, and miscellaneous equipment contaminated by the PCB containing lift fluid. Table 5-1 lists the hazardous waste disposal log for the Building 4019 D&D activity. Missing from this list are the wastes generated during the asbestos and leaded paint abatements conducted by outside contractors. Also, a small quantity of uncontaminated equipment and parts being stored on High Bay and storage room shelving was removed along with the shelving and either divested, scrapped or disposed of as non-hazardous waste. There was also a small quantity of radioactive scabbled concrete debris generated from the decontamination of the High Bay floor that was transferred to the Radioactive Materials Handling Facility (RMHF) for disposal as radioactive low level waste. There was no mixed waste generated.

Table 5-1. Building 4019 Hazardous Waste Disposal Log, 8/98 through 12/98

LOG	ISSUED	DRUM TYPE	DRUM SIZE	RCVD	WASTE	WT
liquid waste						
6782	18-Aug-98	DF OT – Open Top Drum Fiber (Cardboard/Poly)	55 Gallons	20-Aug-98	Lift Fluid w/ PCB'S	419
6655	10-Jul-98	DF CT – Close Top Drum Fiber (Cardboard/Poly)	55 Gallons	20-Aug-98	Lift Fluid w/ PCB'S	452
6656	10-Jul-98	DF CT – Close Top Drum Fiber (Cardboard/Poly)	55 Gallons	20-Aug-98	Lift Fluid w/ PCB'S	418
6779	18-Aug-98	DF OT – Open Top Drum Fiber (Cardboard/Poly)	55 Gallons	20-Aug-98	Lift Fluid w/ PCB'S	393
6780	18-Aug-98	DF OT – Open Top Drum Fiber (Cardboard/Poly)	55 Gallons	20-Aug-98	Lift Fluid w/ PCB'S	439
6781	18-Aug-98	DF OT – Open Top Drum Fiber (Cardboard/Poly)	55 Gallons	10-Sep-98	Glycol	435
6783	18-Aug-98	DF OT – Open Top Drum Fiber (Cardboard/Poly)	55 Gallons	11-Sep-98	Glycol	446
6863	18-Sep-98	DF CT – Close Top Drum Fiber (Cardboard/Poly)	55 Gallons	18-Sep-98	Oily Effluent w/ PCB'S	336
6862	18-Sep-98	DF CT – Close Top Drum Fiber (Cardboard/Poly)	55 Gallons	18-Sep-98	Oily Effluent w/ PCB'S	440
6865	18-Sep-98	DF CT – Close Top Drum Fiber (Cardboard/Poly)	55 Gallons	18-Sep-98	Oily Effluent w/ PCB'S	172
6864	18-Sep-98	DF CT – Close Top Drum Fiber (Cardboard/Poly)	55 Gallons	29-Sep-98	Lift Fluid w/ PCB'S	222
6866	18-Sep-98	DF CT – Close Top Drum Fiber (Cardboard/Poly)	55 Gallons	29-Sep-98	Lift Fluid w/ PCB'S	486
solid waste					sum	4658
6513	15-May-98	DF OT – Open Top Drum Fiber (Cardboard/Poly)	55 Gallons	20-Aug-98	Oily Debris PCB's	63
6748	10-Aug-98	TRIWALL	2 Cubic Yard	20-Aug-98	Oily Debris PCB's	330
6834	10-Sep-98	CF – Container Fiber (Yard Box)	1 Cubic Yard	10-Sep-98	Oily Debris PCB's	206
6814	01-Sep-98	CF – Container Fiber (Yard Box)	1 Cubic Yard	11-Sep-98	Oily Debris PCB's	182
6833	10-Sep-98	CF – Container Fiber (Yard Box)	1 Cubic Yard	18-Sep-98	Oily Debris PCB's	288
6839	11-Sep-98	CF – Container Fiber (Yard Box)	1 Cubic Yard	18-Sep-98	Oily Debris PCB's	826
6840	11-Sep-98	CF – Container Fiber (Yard Box)	1 Cubic Yard	18-Sep-98	Oily Debris PCB's	629
7047	04-Dec-98	DF OT – Open Top Drum Fiber (Cardboard/Poly)	55 Gallons	08-Dec-98	Oily Debris PCB's	225
7052	04-Dec-98	DF OT – Open Top Drum Fiber (Cardboard/Poly)	55 Gallons	08-Dec-98	Oily Debris PCB's	60
6867	18-Sep-98	DF CT – Close Top Drum Fiber (Cardboard/Poly)	55 Gallons	14-Dec-98	Oily Debris PCB's	499
					sum	3308

6.0 PERSONNEL RADIATION EXPOSURE

No measurable radioactive exposure was expected or observed during final remedial operations and final survey activities.

7.0 PROJECT COST SUMMARY

Costs associated with the D&D of Building 4019 were reviewed, categorized and summarized. The summary is presented below.

D&D Planning and Supervision	35K
D&D Operations Labor	86K
Radiation Safety Operations Support	21K
Final Radiological Release Survey and Report	52K
Hazardous Waste Disposal	9K
Final Report and Docket	21K
	224K

8.0 REFERENCES

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12. Addendum to the Verification Survey Report for Buildings T019 and T024, Santa Susana Field Laboratory, Ventura County, California (Ref. 4), ORISE Letter Report , T. Vitkus to A. Gupta (DOE EM-43), Oak Ridge TN, February 16, 1999

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