4.19 TA-37, Magazine Area C

4.19.1 Site Description

TA-37, Magazine Area C [Table 4-17 and Figure 4-19 (index map of TA-37)], is an explosives storage area located at the eastern perimeter of TA-16.

4.19.2 Facilities Description

Table 4-17 identifies the facilities at TA-37 that fall into a facility hazard category because of the type of operations performed in the facility.

4.19.2.1 Facility Hazard Categories

4.19.2.1.1 Nuclear Facility Hazard Categories

No facilities at TA-37 are categorized as nuclear facilities.

4.19.2.1.2 Non-Nuclear Facility Hazard Categories

Twenty-four magazines (Figure 4-19, Sheet 1) are used to store high explosives and are categorized L/ENS. Buildings 3–10 have an area of 192 ft^2 (59 m^2) each, Buildings 11–14 an area of 1,144 ft^2 (349 m^2) each, and Buildings 15–26 an area of 800 ft^2 (244 m^2) each.

4.19.2.2 Nonhazardous Facilities

This site contains three structures that are considered to be nonhazardous: an office building that is closed; Magazine 2, which is nonoperational; and a storage building.

TABLE 4-17

FACILITIES THAT FALL INTO NUCLEAR AND NON-NUCLEAR HAZARD CATEGORIES
TA-37, MAGAZINE AREA C

Facility Number	Building Name	Operations Category	Nuclear Facilities Hazard Categories		Non-Nuclear Facility Hazard Categories					
			Cat. 2	Cat. 3	M/RAD	M/CHEM	L/RAD	L/ENS	L/CHEM	L/ENV
3	Magazine	High Explosives						X		
4	Magazine	High Explosives						X		
5	Magazine	High Explosives						X		
6	Magazine	High Explosives						X		
7	Magazine	High Explosives						X		
8	Magazine	High Explosives						X		
9	Magazine	High Explosives						X		
10	Magazine	High Explosives						X		
11	Magazine	High Explosives						X		
12	Magazine	High Explosives						X		
13	Magazine	High Explosives						X		
14	Magazine	High Explosives						X		
15	Magazine	High Explosives						X		
16	Magazine	High Explosives						X		
17	Magazine	High Explosives						X		
18	Magazine	High Explosives						X		
19	Magazine	High Explosives						X		
20	Magazine	High Explosives						X		
21	Magazine	High Explosives						X		
22	Magazine	High Explosives						X		
23	Magazine	High Explosives						X		
24	Magazine	High Explosives						X		
25	Magazine	High Explosives						X		
26	Magazine	High Explosives						X		

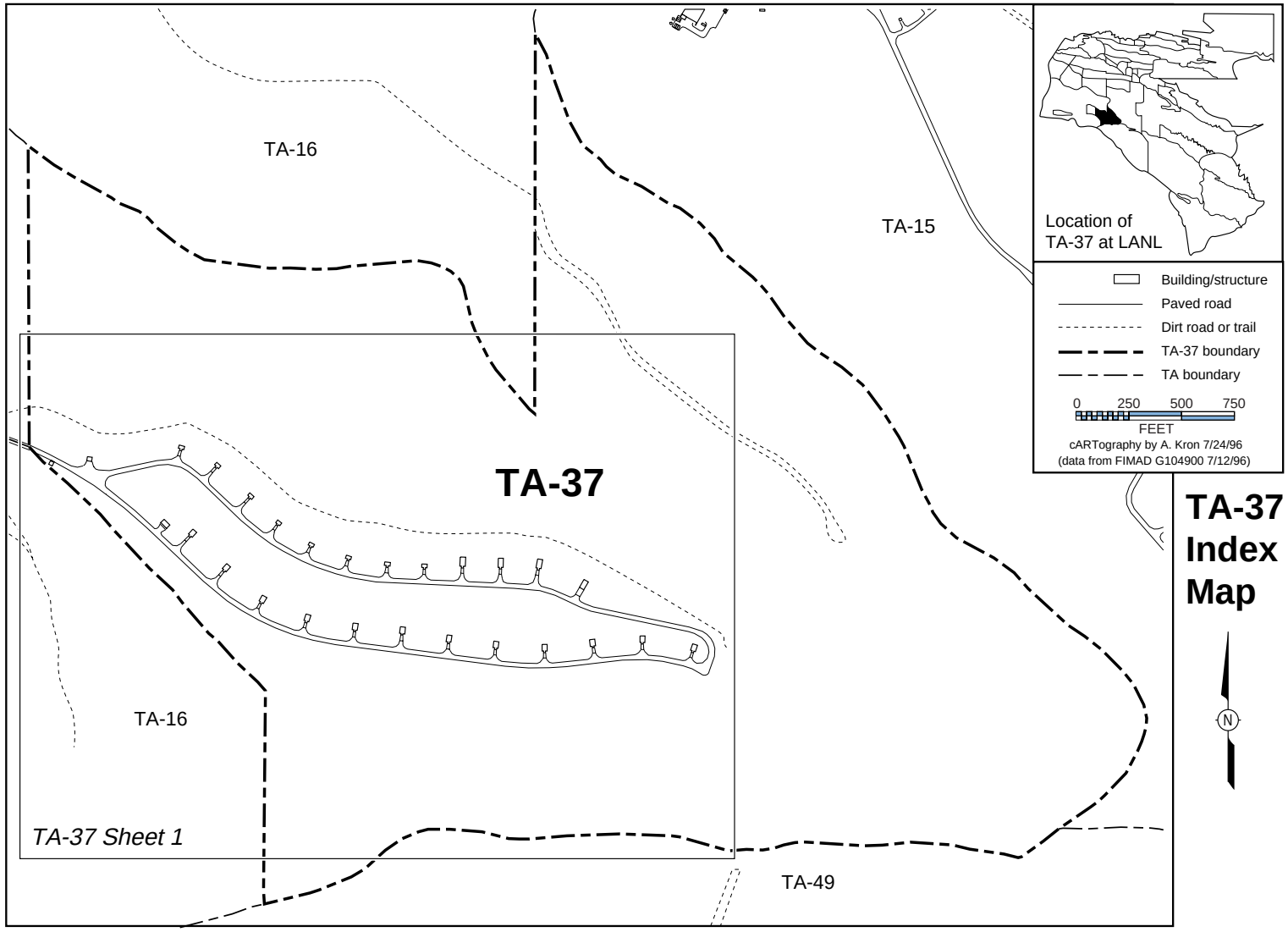


Figure 4-19. Map of TA-37, Magazine Area C—Index Map.

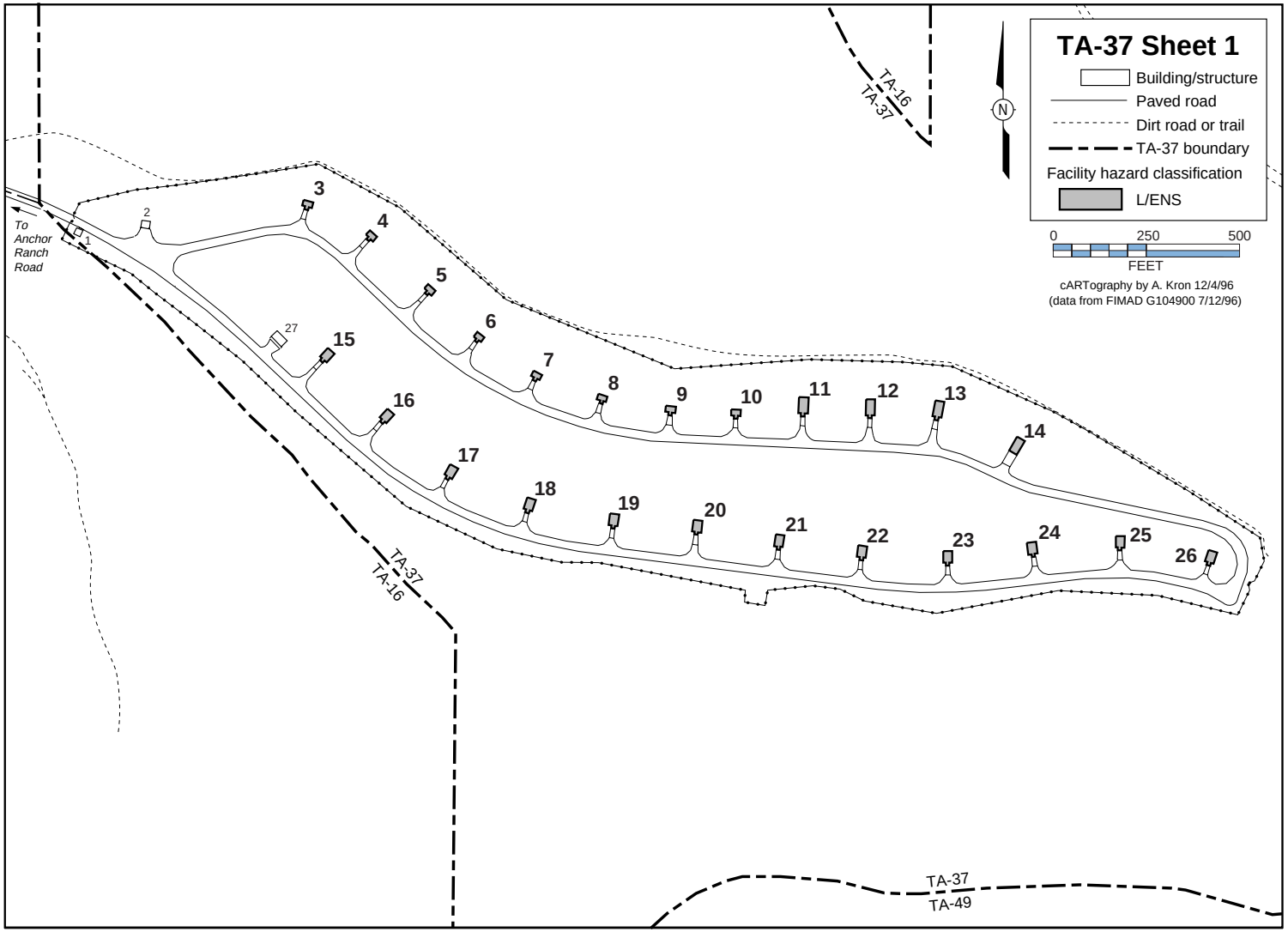


Figure 4-19. Map of TA-37, Magazine Area C—Sheet 1.

4.20 TA-39, Ancho Canyon

4.20.1 Site Description

TA-39, Ancho Canyon [Table 4-18 and Figure 4-20 (index map of TA-39)], is located at the bottom of Ancho Canyon off State Road 4 between Los Alamos and White Rock. The technical area was created when explosives work at TA-15 became too crowded and a new space for shock wave physics work was needed. This site was chosen because the deep canyon and steep walls isolate explosives tests from the public.

The behavior of non-nuclear weapons is studied here, primarily by photographic techniques. Investigators also study various phenomenological aspects of explosives, interactions of explosives, explosions involving other materials, shock wave physics, equation-of-state measurements, and pulsed-power systems design.

Operations at TA-39 center around three kinds of work: dynamic HE experiments, high-voltage capacitor bank operations, and gas gun experiments supported by explosives storage and handling, machine shops, heavy equipment, laboratory preparations, data analysis, and administrative support.

4.20.2 Facilities Description

4.20.2.1 Facility Hazard Categories

Table 4-18 identifies the facilities at TA-39 that fall into a facility hazard category because of the type of operations performed in the facility.

4.20.2.1.1 Nuclear Facility Hazard Categories

No buildings at TA-39 are categorized as nuclear facilities.

4.20.2.1.2 Non-Nuclear Facility Hazard Categories

Thirteen facilities at TA-39 are categorized as L/ENS, and two facilities are categorized as L/RAD.

4.20.2.1.2.1 Buildings Categorized L/RAD

####### 4.20.2.1.2.1.1 Laboratory/Office Building

This Laboratory/Office Building (Building 2, Figure 4-20, Sheet 4) supports work involving HE, neutron research, x-ray sources, and DU. Categorized both as L/RAD and L/ENS, it is shown on the figure as L/RAD.

####### 4.20.2.1.2.1.2 Neutron Flux Storage Building

The Neutron Flux Storage Building (Building 138, Figure 4-20, Sheet 2) is also located at this site. This building is used for storing sealed plutonium/beryllium neutron sources.

4.20.2.1.2.2 Buildings Categorized L/ENS

####### 4.20.2.1.2.2.1 Firing Site PT-6

Firing Site PT-6, also called Firing Chamber #1, Building 6 (Figure 4-20, Sheet 2), is the firing site for the NHMFL, a consortium of LANL, the University of Florida, and Florida State University. Ex-

periments at NHMFL usually involve HE detonations and high-voltage discharges from the energy storage capacitor bank, which produce extremely intense magnetic fields and electromagnetic pulses. The experiments are supported by operations involving HE storage and handling, machine shops, heavy equipment, laboratory preparations, data analyses, and administrative support. The organizations that provide these functions are located at TA-39.

4.20.2.1.2.2.2 Firing Site PT-88

TA-39 is the home of Firing Site PT-88, also called Firing Chamber #2 (Buildings 7 and 57, Figure 4-20, Sheet 1), which is used to study high-energy-density properties in experiments that use explosive-driven pulsed power. The primary diagnostic techniques are photographic methodologies and electrical measurements. Various phenomenological aspects of explosives, interactions of explosives, and explosions acting on other materials are also investigated. In some cases, the explosion is contained; however, open detonation is used for most tests.

4.20.2.1.2.2.3 Gas Guns

Equation-of-state experiments to determine the properties of materials at extreme conditions are carried out in Buildings 56 (Figure 4-20, Sheet 2) and 69 (Figure 4-20, Sheet 4). These experiments use the two-stage gas gun in Building 69 and the single-stage gas gun in Building 56. Several facilities support these activities, including Building 89, the Gas Gun Support Building (Figure 2, Sheet 4).

4.20.2.1.2.2.4 Capacitor Bank Bunker

The Capacitor Bank Bunker (Building 95, Figure 4-20, Sheet 1) is categorized as L/ENS.

4.20.2.1.2.2.5 Other TA-39 Buildings Categorized L/ENS

Buildings 3 (Magazine), 4 (Trim Building), 5 (Ready Magazine), and 77 (Magazine) (Figure 4-20, Sheet 3) are used for HE storage. Building 54 (Transportainer, Figure 4-20, Sheet 2) is used for storing thermite. HE is used in Building 111 (Pulsed-Power Building, Figure 4-20, Sheet 3).

4.20.2.2 Nonhazardous Facilities

The rest of the buildings at TA-39 house operations that are considered to be nonhazardous.

TABLE 4-18

FACILITIES THAT FALL INTO NUCLEAR AND NON-NUCLEAR HAZARD CATEGORIES
TA-39, ANCHO CANYON

Facility Number	Building Name	Operations Category	Nuclear Facilities Hazard Categories		Non-Nuclear Facility Hazard Categories					
			Cat. 2	Cat. 3	M/RAD	M/CHEM	L/RAD	L/ENS	L/CHEM	L/ENV
2	Laboratory/Office Building	High Explosives					X	X		
3	Magazine	High Explosives						X		
4	Trim Building	High Explosives						X		
5	Ready Magazine	High Explosives						X		
6	PT-6	High Explosives						X		
7	PT-88	High Explosives						X		
54	Transportainer	High Explosives						X		
56	Gun Building	High Explosives						X		
57	Firing Chamber	High Explosives						X		
69	Light Gas Gun Facility	High Explosives						X		
77	Magazine	High Explosives						X		
89	Gas Gun Support Building	High Explosives						X		
95	Capacitor Bank Bunker	High Explosives						X		
111	Pulsed Power Building	High Explosives						X		
138	Neutron Flux Storage Building	High Explosives					X			

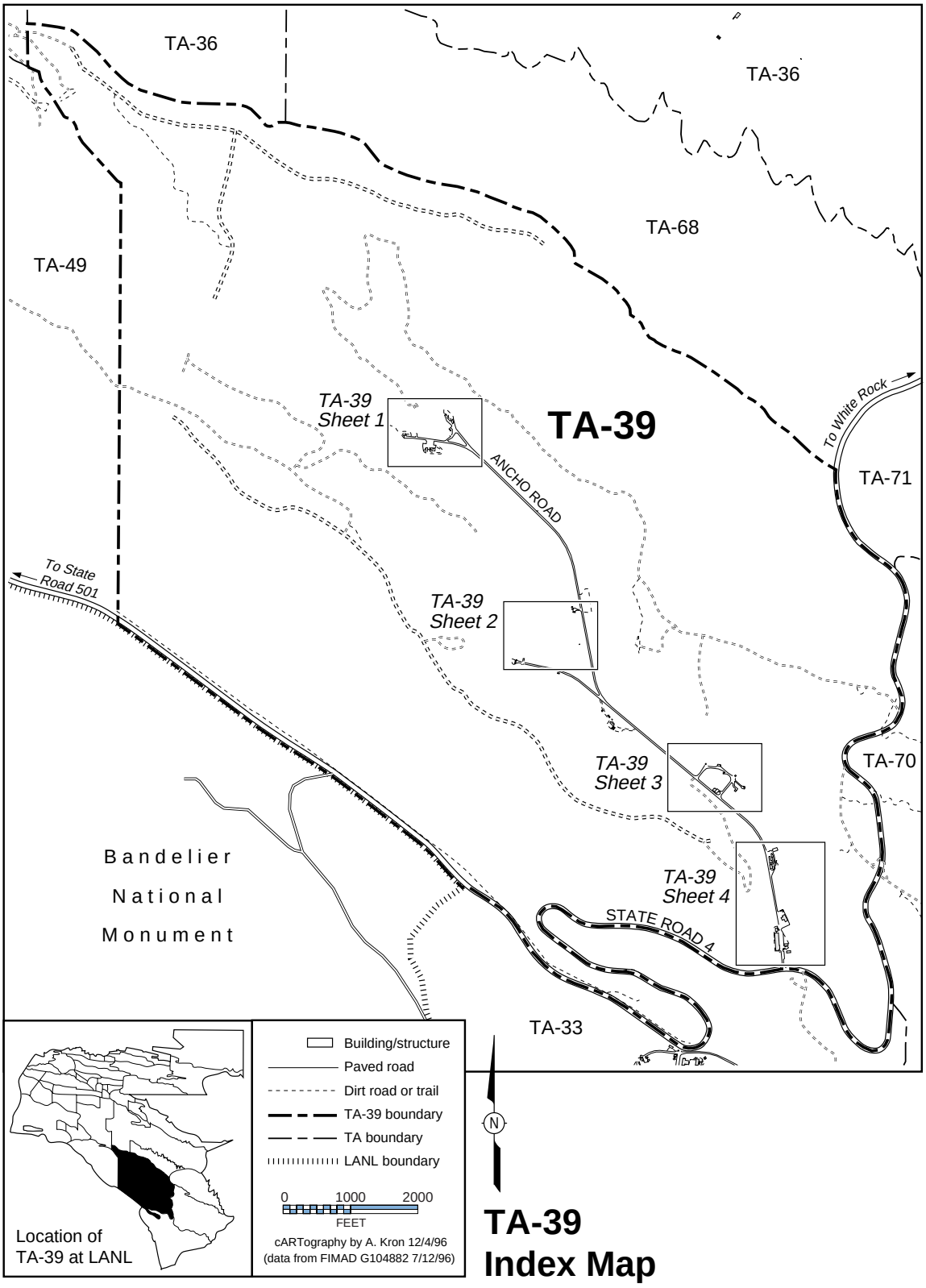


Figure 4-20. Map of TA-39, Ancho Canyon—Index Map.

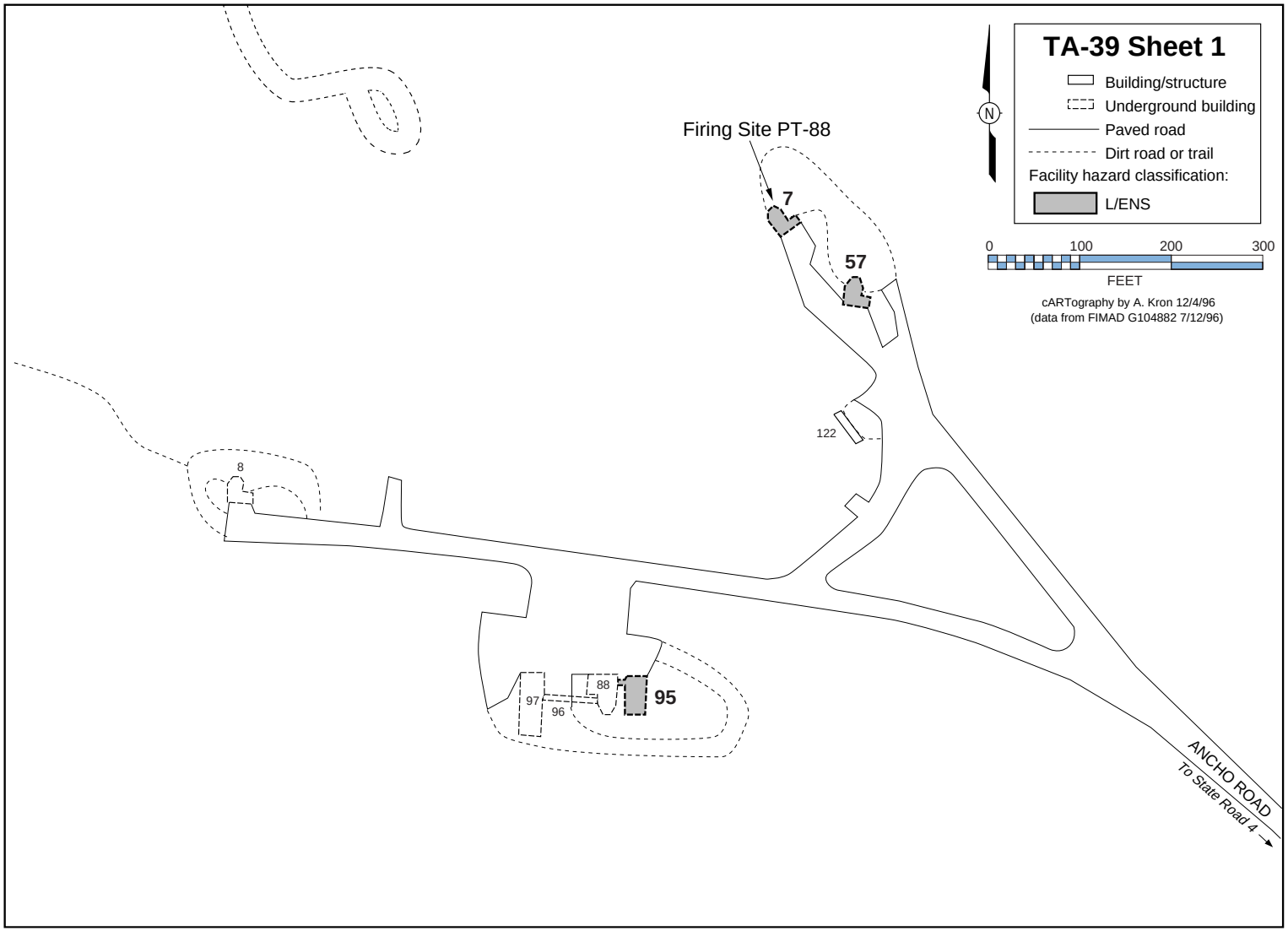


Figure 4-20. Map of TA-39, Ancho Canyon—Sheet 1.

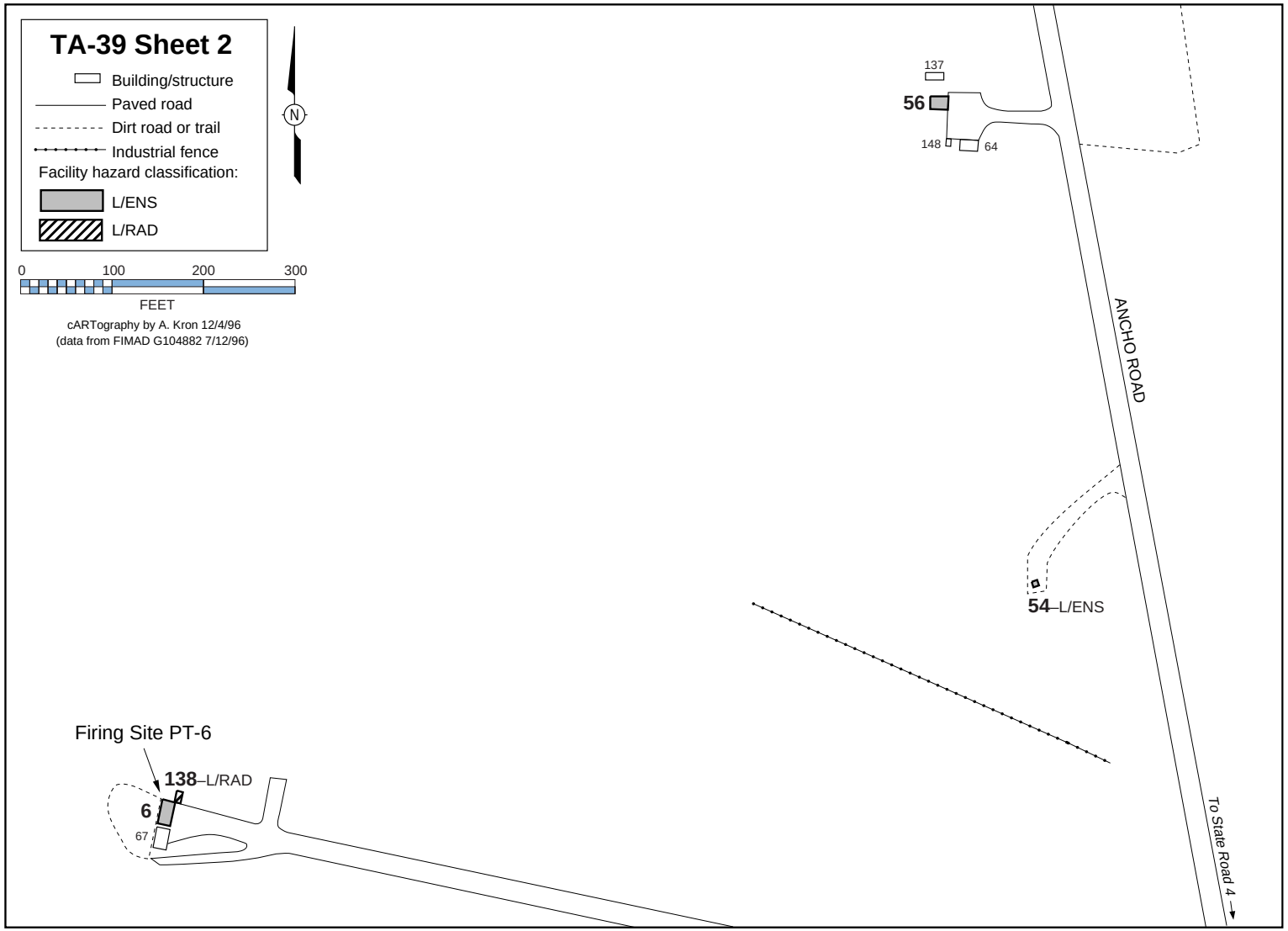


Figure 4-20. Map of TA-39, Ancho Canyon—Sheet 2.

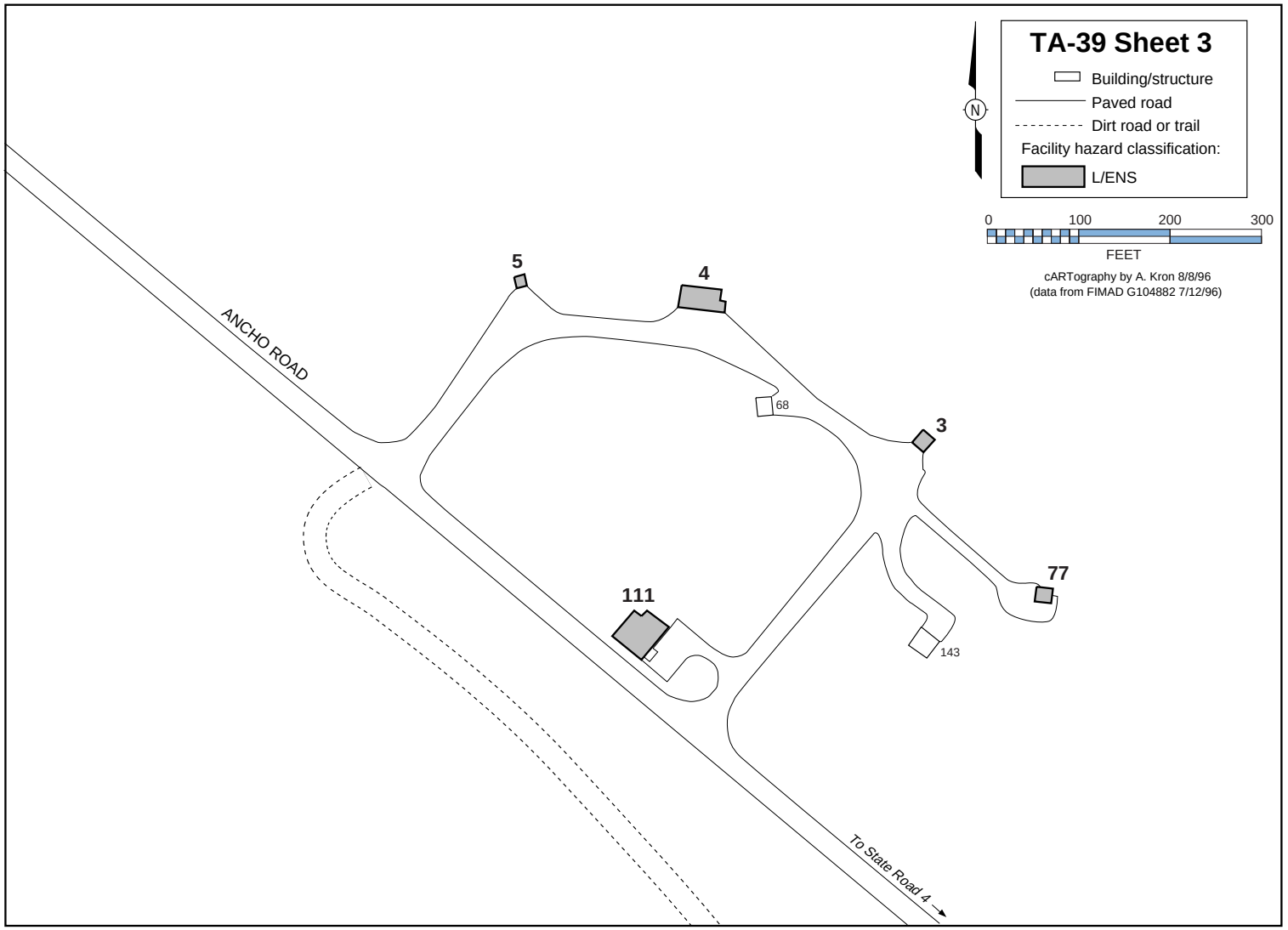


Figure 4-20. Map of TA-39, Ancho Canyon—Sheet 3.

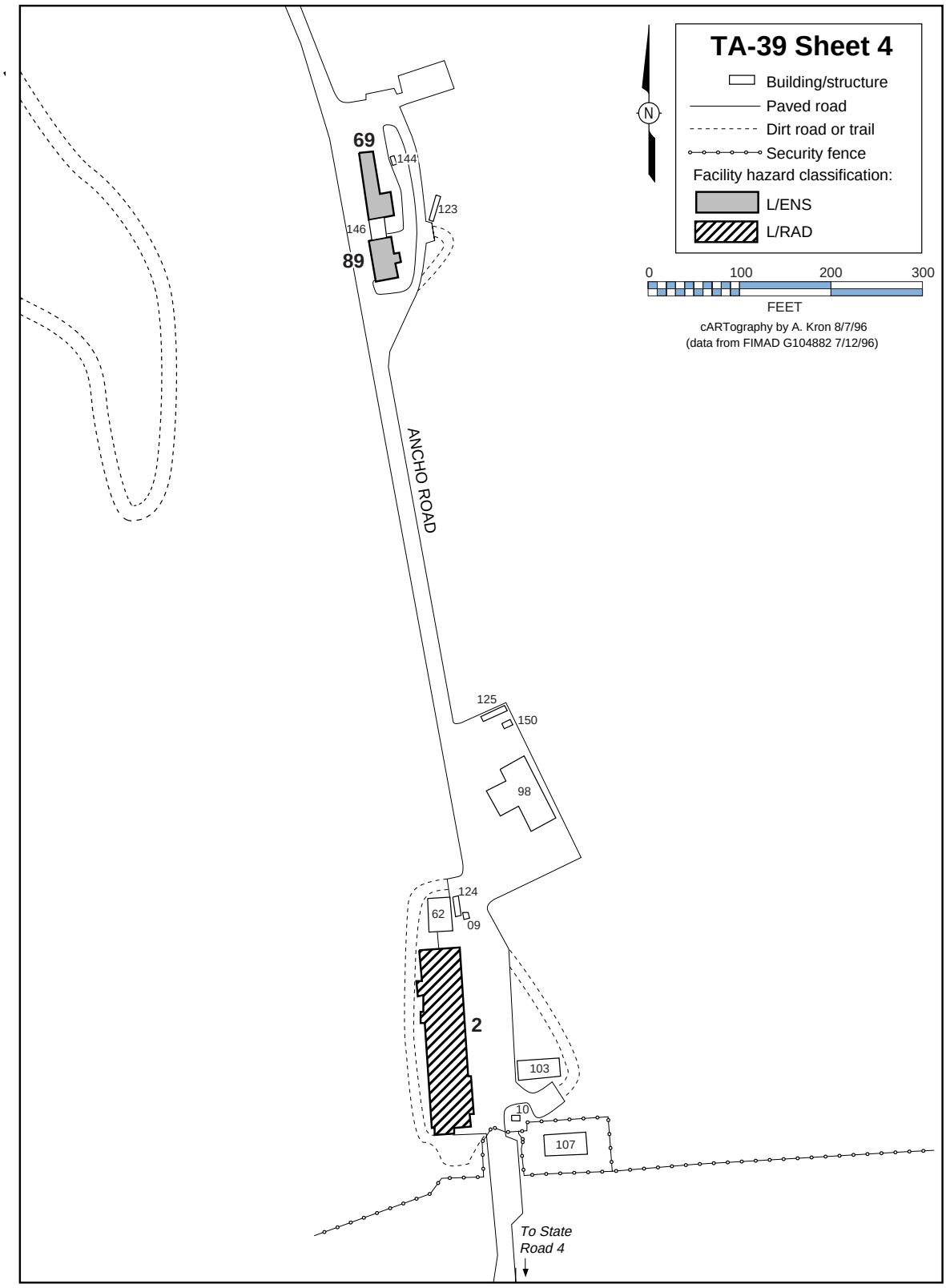


Figure 4-20. Map of TA-39, Ancho Canyon—Sheet 4.

4.21 TA-40, DF Site

4.21.1 Site Description

DF Site at TA-40 [Table 4-19 and Figure 4-21 (index map of TA-40)] is used to develop special detonators for initiating high-explosives systems. Fundamental and applied research includes investigating phenomena associated with the physics of HE and research in rapid-shock-induced reactions. The site is also used for investigating the physics and chemistry of detonators and shock wave propagation. TA-40 is centrally located inside Laboratory boundaries, yet is well isolated from populated areas and other Laboratory sites. The site is located at the end of Two Mile Road on Two Mile Mesa and covers 68 acres (27.5 ha).

4.21.2 Facilities Description

4.21.2.1 Facility Hazard Categories

Table 4-19 identifies the facilities at TA-40 that fall into a facility hazard category because of the type of operations performed in the facility.

4.21.2.1.1 Nuclear Facility Hazard Categories

No buildings at TA-40 have been categorized as nuclear facilities.

4.21.2.1.2 Non-Nuclear Facility Hazard Categories

Twenty-two buildings at TA-40 have been categorized as L/ENS because of their use in explosives testing. The explosives-testing facilities at TA-40 have been designed to protect onsite personnel, the public, and the environment. The firing sites consist of a steel, concrete, and earthen pad for the explosives, and a small fortified structure to protect the operator and instrumentation. The magazines are small, reinforced-concrete structures, whose capacities for storing explosives range from 397 to 2,646 lb (180 to 1,200 kg). The rooms in which the explosives are prepared for tests are reinforced-concrete structures.

4.21.2.2 Nonhazardous Facilities

The eight nonhazardous buildings at TA-40 are an office building, a storage building, and six miscellaneous structures.

TABLE 4-19

FACILITIES THAT FALL INTO NUCLEAR AND NON-NUCLEAR HAZARD CATEGORIES
TA-40, DF SITE

Facility Number	Building Name	Operations Category	Nuclear Facilities Hazard Categories		Non-Nuclear Facility Hazard Categories					
			Cat. 2	Cat. 3	M/RAD	M/CHEM	L/RAD	L/ENS	L/CHEM	L/ENV
2	Magazine	High Explosives						X		
3	Preparation Building	High Explosives						X		
4	Firing Point	High Explosives						X		
5	Firing Point	High Explosives						X		
6	Preparation Building	High Explosives						X		
7	Magazine	High Explosives						X		
8	Firing Point	High Explosives						X		
9	Firing Point	High Explosives						X		
10	Magazine	High Explosives						X		
11	Preparation and Utilities Building	High Explosives						X		
12	Firing Point	High Explosives						X		
13	Magazine	High Explosives						X		
14	Preparation Building	High Explosives						X		
15	Firing Point	High Explosives						X		
23	Machine Shop	High Explosives						X		
36	Magazine	High Explosives						X		
37	Magazine	High Explosives						X		
38	Magazine	High Explosives						X		
39	Magazine	High Explosives						X		
40	Magazine	High Explosives						X		
41	Laboratory Building	High Explosives						X		
72	Storage Building	High Explosives						X		

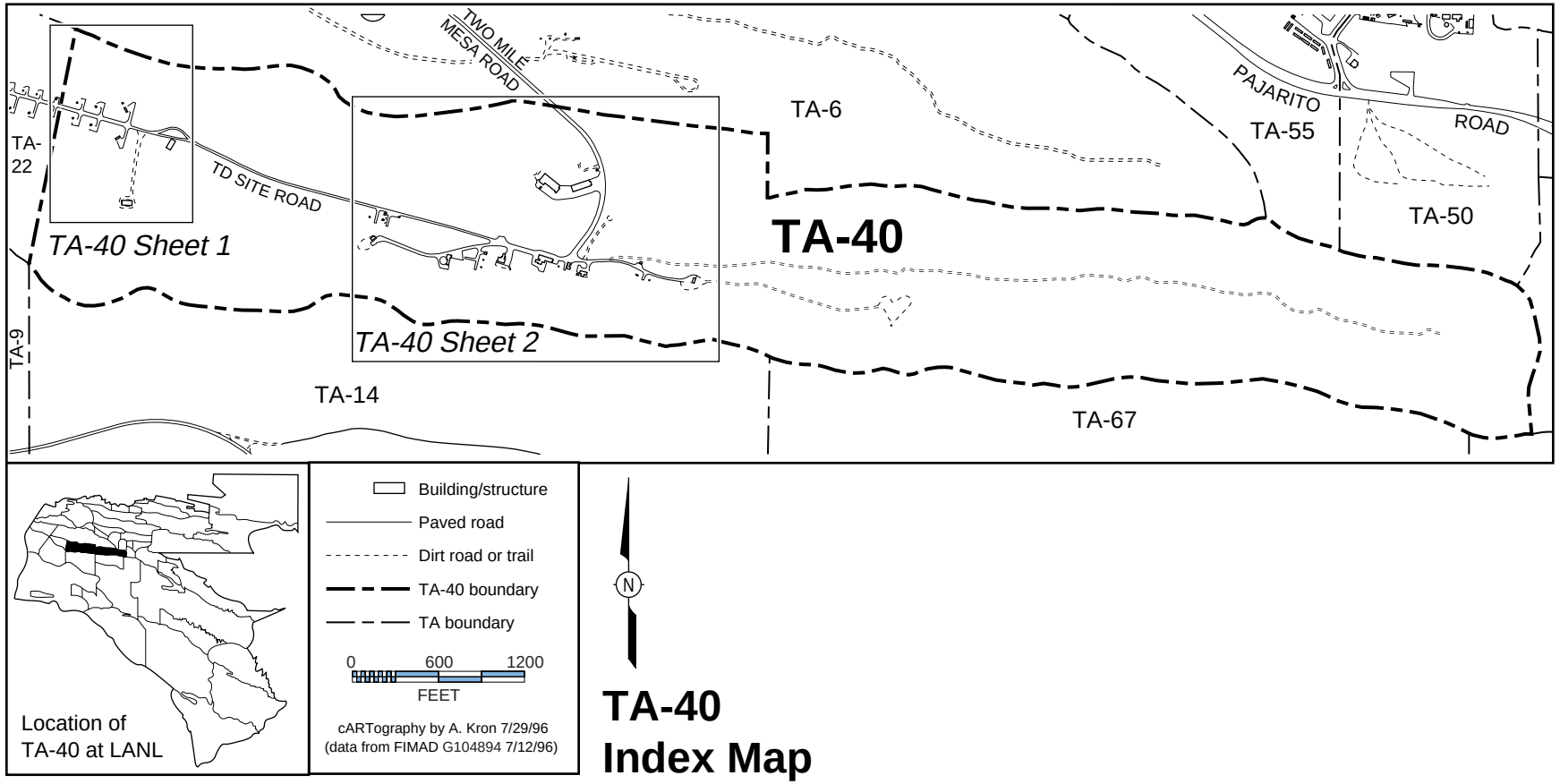


Figure 4-21. Map of TA-40, DF Site—Index Map.

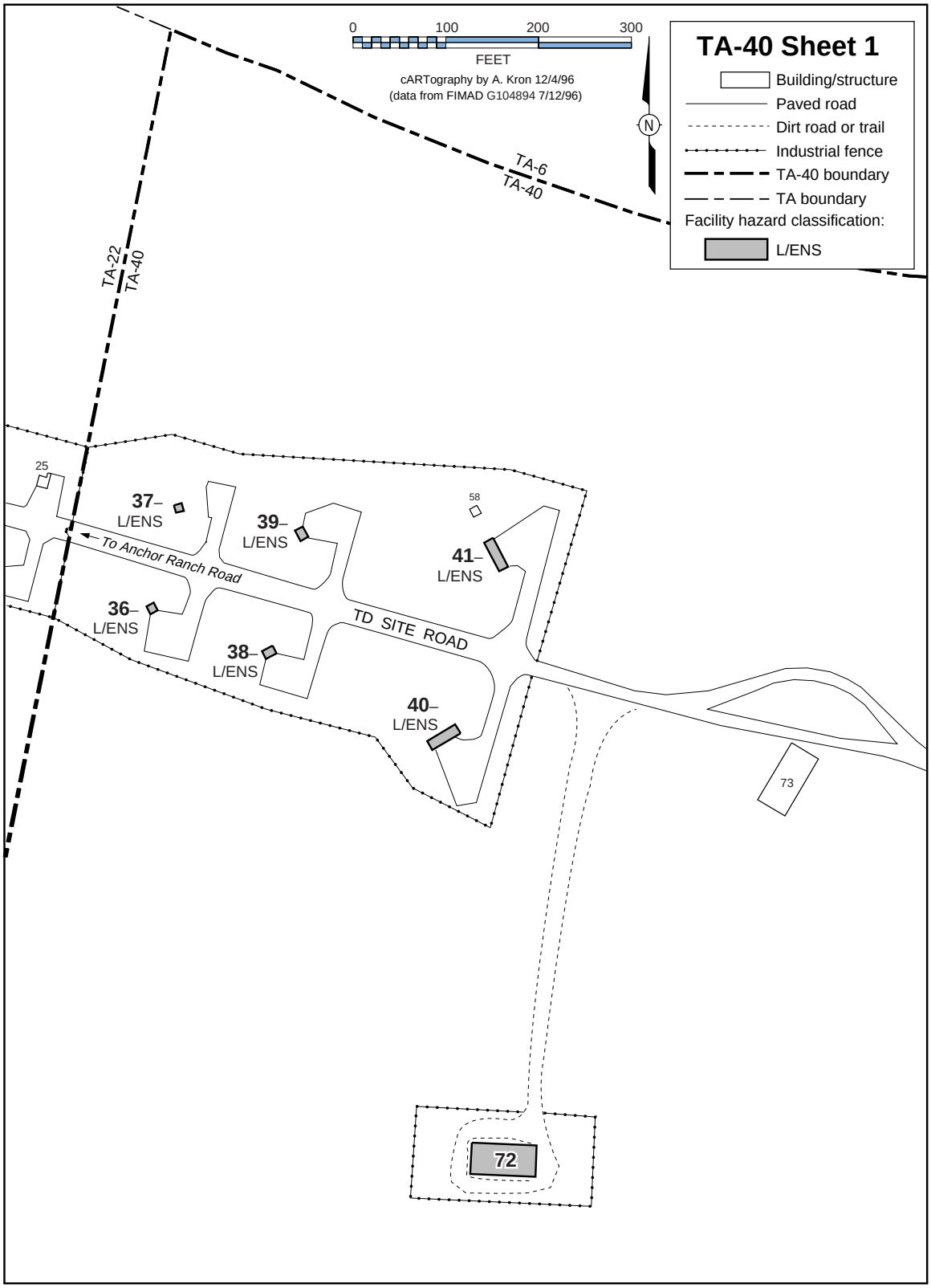


Figure 4-21. Map of TA-40, DF Site—Sheet 1.

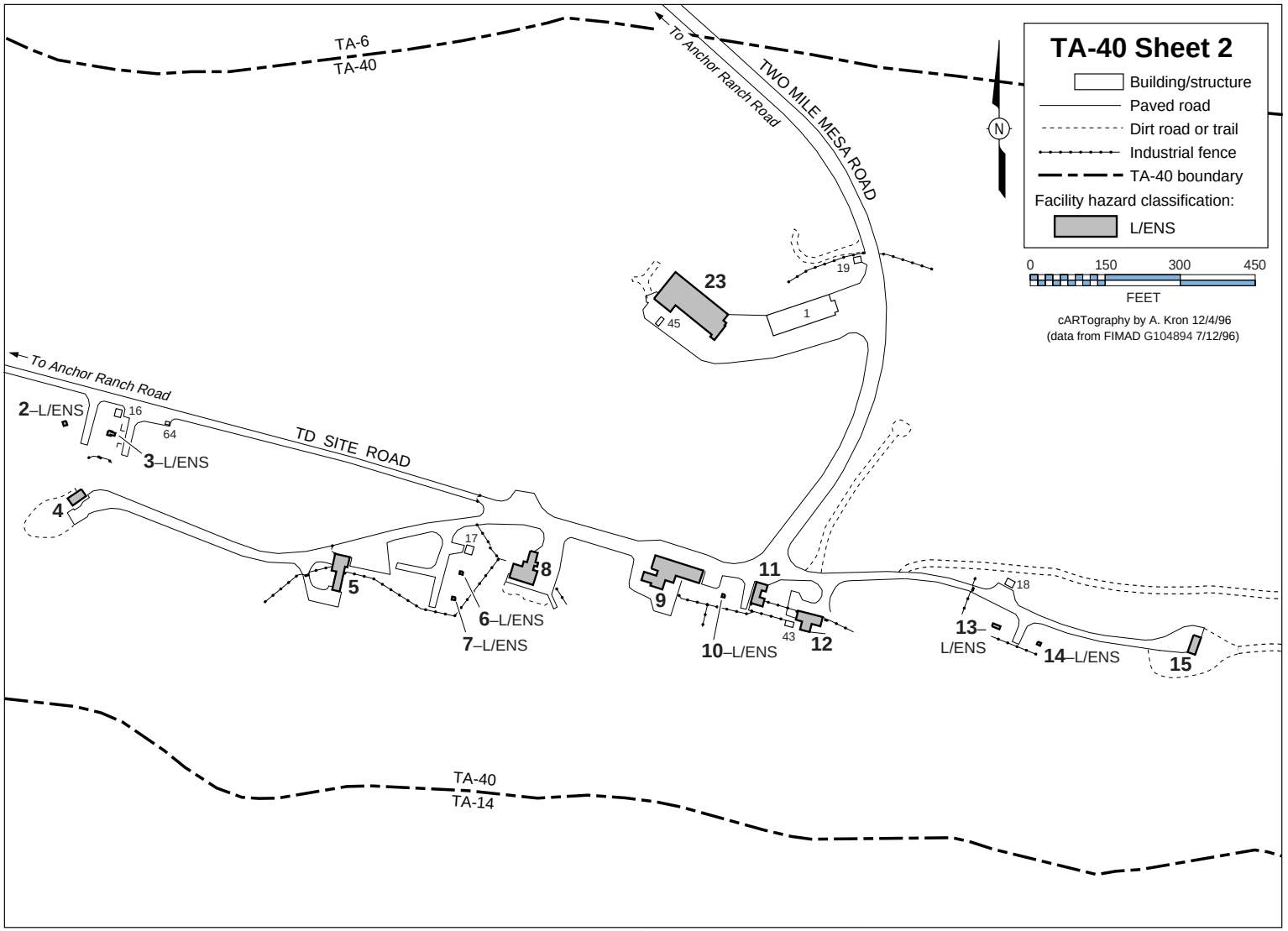


Figure 4-21. Map of TA-40, DF Site—Sheet 2.

4.22 TA-41, W Site

4.22.1 Site Description

TA-41 [Table 4-20 and Figure 4-22 (index map of TA-41)] encompasses approximately 40 acres (16.2 ha) in Los Alamos Canyon and contains three major interrelated structures: an office building, a laboratory/office building, and an underground nuclear materials storage vault. TA-41 contains approximately 42,055 ft^2 (12,818 m^2) of usable floor space. Built in the 1950s to house tritium work, TA-41 is currently used for a variety of administrative/technical activities and nontritium research and development activities. All nuclear material had been removed from TA-41 by 1995.

4.22.2 Facilities Description

Over the approximately 40 years that TA-41 was used for work involving tritium, the facilities provided capability for the research and development of weapons subsystems (boost systems). These capabilities included high-pressure testing, leak testing, precision volume measurement, and testing prototype and war reserve boost systems with and without tritium. Computer-aided design/manufacture facilities onsite were used to design hardware. Mechanical fabrication and assembly of prototype and war-reserve-like components were possible. Long-term environmental storage of prototype and war reserve boost systems with and without tritium were available. Some of these capabilities continue to be used in testing without tritium.

Past operations at TA-41 included handling and storing materials such as uranium, tritium, hydrogen, deuterium, and liquid nitrogen. Tritium gas mixtures were prepared to use in nuclear testing at the Nevada Test Site.

4.22.2.1 Facility Hazard Categories

Table 4-20 identifies the facilities at TA-41 that fall into a facility hazard category because of the type of operations performed in the facility.

4.22.2.1.1 Nuclear Facility Hazard Categories

Although no buildings at TA-41 are currently categorized as nuclear facilities, two buildings were categorized as nuclear facilities until 1994: the Laboratory portion of Building 4 and the vault (Building 1).

4.22.2.1.2 Non-Nuclear Facilities Hazard Categories

4.22.2.1.2.1 Building Categorized M/RAD

Building 4 is currently categorized M/RAD because of plutonium and tritium residues from past operations. Building 4 is equipped with gloveboxes and a tritium-piping system. Tritium was collected on—and recovered from—metal tritride getters and molecular sieve beds. Scrubbed exhaust was vented to the stack.

4.22.2.1.2.2 Building Categorized L/RAD

Building 1, the underground storage vault, is categorized L/RAD because it contains plutonium and tritium residues. Although no special nuclear materials are stored in the vault, the building continues to be used as a secure storage area.

4.22.2.1.2.3 Building Categorized L/CHEM

Building 7, which contains a chlorine storage tank, is categorized as L/CHEM.

4.22.2.2 Nonhazardous Facilities

The office and light laboratory portion of Building 4, another office building (Building 30), and the rest of the support facilities that make up the structures at the TA are considered to be nonhazardous.

TABLE 4-20

FACILITIES THAT FALL INTO NUCLEAR AND NON-NUCLEAR HAZARD CATEGORIES
TA-41, W SITE

Facility Number	Building Name	Operations Category	Nuclear Facilities Hazard Categories		Non-Nuclear Facility Hazard Categories					
			Cat. 2	Cat. 3	M/RAD	M/CHEM	L/RAD	L/ENS	L/CHEM	L/ENV
1	Underground Vault	Experimental Science					X			
4	Laboratory Building	Experimental Science			X					
7	Imhoff Tank and Chlorine Room	Physical Support							X	

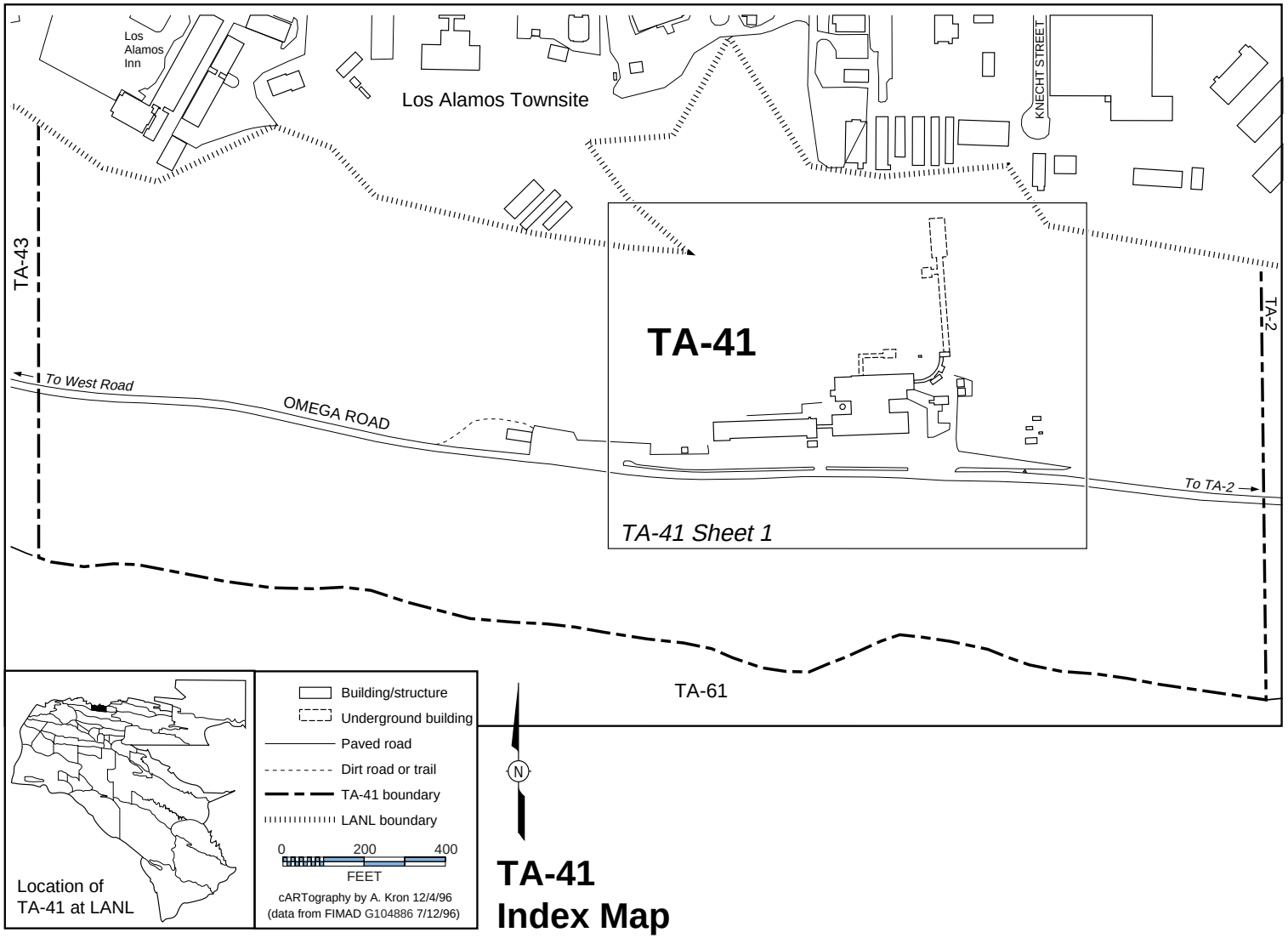


Figure 4-22. Map of TA-41, W Site—Index Map.

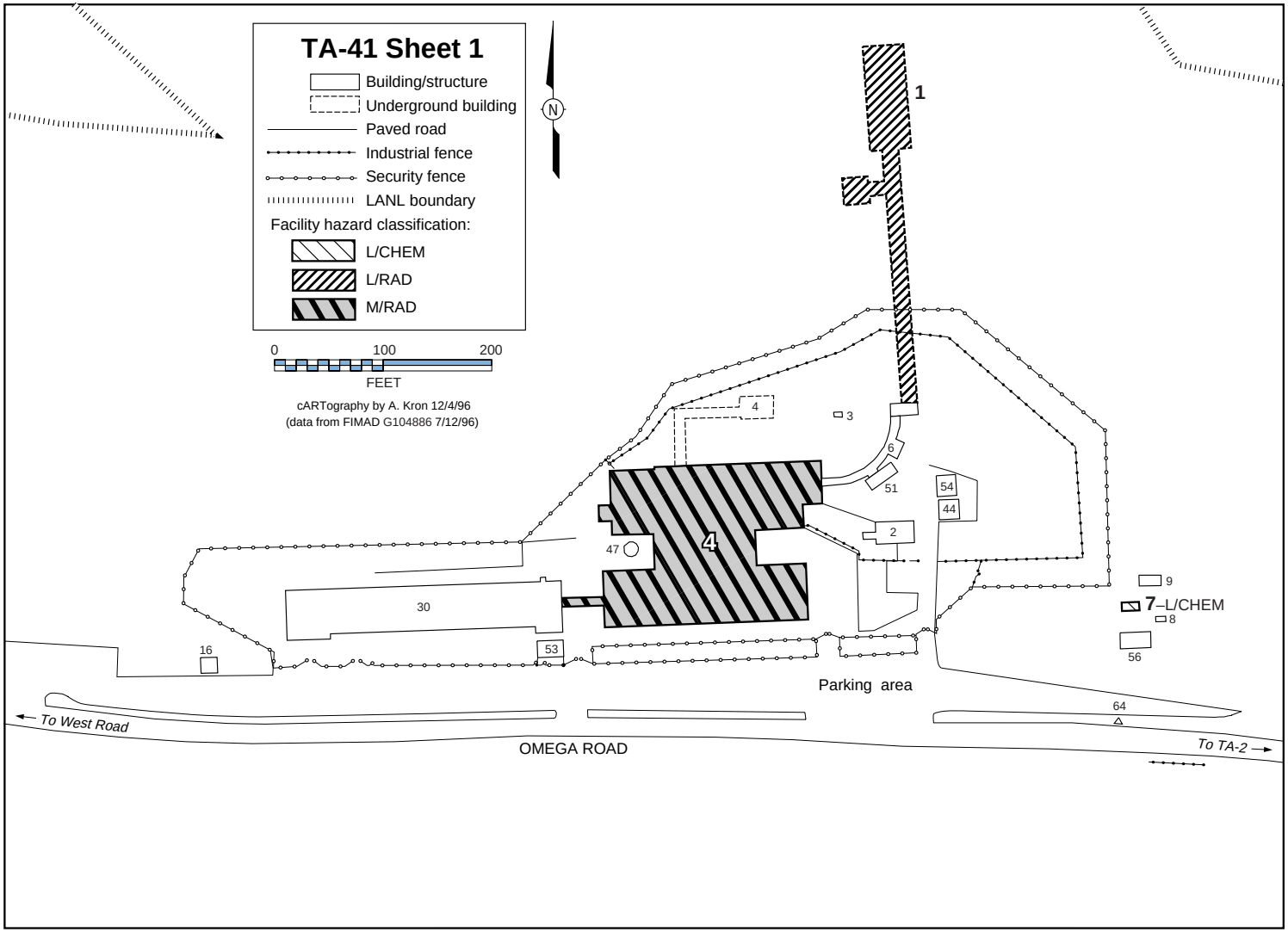


Figure 4-22. Map of TA-41, W Site—Sheet 1.

4.23 TA-43, Health Research Laboratory and DOE Los Alamos Area Office

4.23.1 Site Description

TA-43 [Table 4-21 and Figure 4-23 (index map of TA-43)] is a small site located adjacent to the Los Alamos Medical Center on Diamond Drive. Two major facilities are located at the site: the Health Research Laboratory (HRL) Complex is the focal point of biosciences and biotechnology at the Laboratory. Research performed at HRL includes structural, molecular, and cellular radiobiology; biophysics; mammalian radiobiology; biochemistry; and genetics. The HRL facility has no perimeter fence, but the dock/service area has a security fence and gate. Access to the facility is controlled by badge reader, and the main lobby and business office area are accessible to the public during working hours. The other major facility is the DOE's local area office (Building 39), where the contract for operating the Laboratory is managed.

4.23.2 Facilities Description

The HRL Complex at TA-43 is the location of the Laboratory's core competency in bioscience and biotechnology. Originally, the Atomic Energy Commission sponsored research at the Laboratory on how radionuclides associated with the Manhattan Project were taken up, transported, deposited, and eliminated by the human body. This research was needed to protect workers. Studies were also begun on the ways different types of radiation affect living systems. Later, the Laboratory established the Center for Human Genome Studies to provide the massive computer capability needed for mapping the human genome. These early research activities have evolved into HRL's current research programs.

At the HRL Complex, investigators seek to understand the relationships between energy and health through research on the effects of different types of radiation and chemicals on cells and subcellular components. This research is important because of DOE's work in nuclear fission and fossil fuels, both of which can generate by-products that damage deoxyribonucleic acid (DNA) and lead to carcinogenesis. HRL research addresses the molecular basis of mutagenesis, repair of DNA, and regulation of gene expression.

HRL also supports DOE's national security needs. One research area addresses the mechanisms by which the pulmonary system protects itself and repairs itself after having been damaged by foreign materials, including toxic inhalants. Finally, researchers in microbial ecology and plant genetics seek to identify and understand responses of microorganism communities and plants to environmental stressors, including drought and the aftermath of national-defense-related activities.

Although LANL personnel have participated in human radiation experiments in the past, this research has been discontinued. Two operations currently conducted at HRL, neurobiology and in-vivo monitoring, involve monitoring humans; neither procedure is invasive. Neurobiology research involves measuring magnetic waves emanating from the brain. In-vivo monitoring detects any incorporation of radioactive material in personnel, which usually occurs as the result of accidental inhalation. These operations are part of the Laboratory's radiation protection program.

The HRL Complex includes offices and laboratories (Buildings 1, 20, 24, and 37); a sewage lift station (Building 10); storage buildings (Buildings 12, 28, 36, and 46); a cooling tower (Building 44); a computer and instrument building (Building 45); and chemical storage structures (Buildings 47, 49, and 61).

4.23.2.1 Facility Hazard Categories

Table 4-21 identifies the facilities at TA-43 that fall into a facility hazard category because of the type of operations performed in the facility.

4.23.2.1.1 Nuclear Facility Hazard Categories

No buildings at TA-43 are categorized as nuclear facilities.

4.23.2.1.2 Non-Nuclear Facility Hazard Categories

4.23.2.1.2.1 Buildings Categorized L/CHEM

4.23.2.1.2.1.1 Health Research Laboratory

Building 1 (Figure 4-23, Sheet 1) is categorized both as L/RAD and L/CHEM. However, Figure 4-23 shows the building as L/CHEM because chemical contaminants are the greater concern. The main building consists of three stories with offices and laboratories; an equipment penthouse; and a subbasement that houses equipment, shops, and the Laboratory's in-vivo monitoring operation. It has a total area of ~93,000 ft^2 (~28,346 m^2), of which ~53,000 ft^2 (~16,154 m^2) are devoted to offices and research laboratories. The original building, constructed in 1953 of reinforced concrete, has five additions of concrete block and/or reinforced concrete construction.

In addition to chemical and radiological operations, the main building houses a small ~3,000 ft^2 (~914 m^2) live-animal colony composed of rats, mice, and rabbits used in cell and tissue studies. The animals are not used for studies of infectious agents. No other mammals, including primates, are housed in the animal colony.

The building has several HVAC systems that heat or cool air drawn in from outside. The conditioned air is distributed to individual rooms within the complex. Exhaust air is drawn from individual rooms and corridors and is channeled out of the building through several stacks. These stacks are not monitored for toxic or radiological materials, nor do they contain filters. Chemical fume hoods throughout the building serve simple, laboratory-scale, organic chemistry operations. Radiological operations are restricted to five labs located on the first floor of the northeast wing. These operations are not conducted in hoods or gloveboxes, nor do they require special air-handling equipment. The building is classed as L/RAD (x-ray generating equipment, experimental and diagnostic x-ray machines, and lasers) and L/CHEM.

In mid-1996, a 5,300-ft^2 (1,615-m^2) two-floor addition was constructed off the northwest corner of the existing structure. The flow cytometry research and instrument development program and the structural biology program will move into the addition in late 1997. This addition will contain five instrument laboratories, three computer rooms, six offices, a computer graphics room, restrooms, mechanical and electrical service rooms, and other necessary support closets. The laboratories will be on the ground floor, where equipment, including lasers, will be isolated from vibration and the flooring will support heavy loads. Existing plant utilities will be extended from the main building into the addition, except that the addition will have its own HVAC unit and a new water chiller system will be installed; the chilled water will cool instruments, mainly lasers.

4.23.2.1.2.1.2 Safety Storage Shed

Building 47 (Figure 4-23, Sheet 1), a safety storage shed where chemical waste is stored, has a classification of L/CHEM.

4.23.2.1.2.2 Building Categorized L/ENS

One transportable building (Building 20, Figure 4-23, Sheet 1), which houses lasers, is categorized L/ENS.

4.23.2.2 Nonhazardous Facilities

The rest of the buildings that make up the HRL Complex (Figure 4-23) contain operations considered to be nonhazardous. The DOE's Los Alamos Area Office (Building 39) is also considered to be a nonhazardous facility.

TABLE 4-21

FACILITIES THAT FALL INTO NUCLEAR AND NON-NUCLEAR HAZARD CATEGORIES TA-43, HEALTH RESEARCH LABORATORY AND DOE LOS ALAMOS AREA OFFICE

Facility Number	Building Name	Operations Category	Nuclear Facilities Hazard Categories		Non-Nuclear Facility Hazard Categories					
			Cat. 2	Cat. 3	M/RAD	M/CHEM	L/RAD	L/ENS	L/CHEM	L/ENV
1	Health Research Laboratory	Experimental Science							X	
20	Transportable	Experimental Science						X		
47	Chemical Shed	Experimental Science							X	

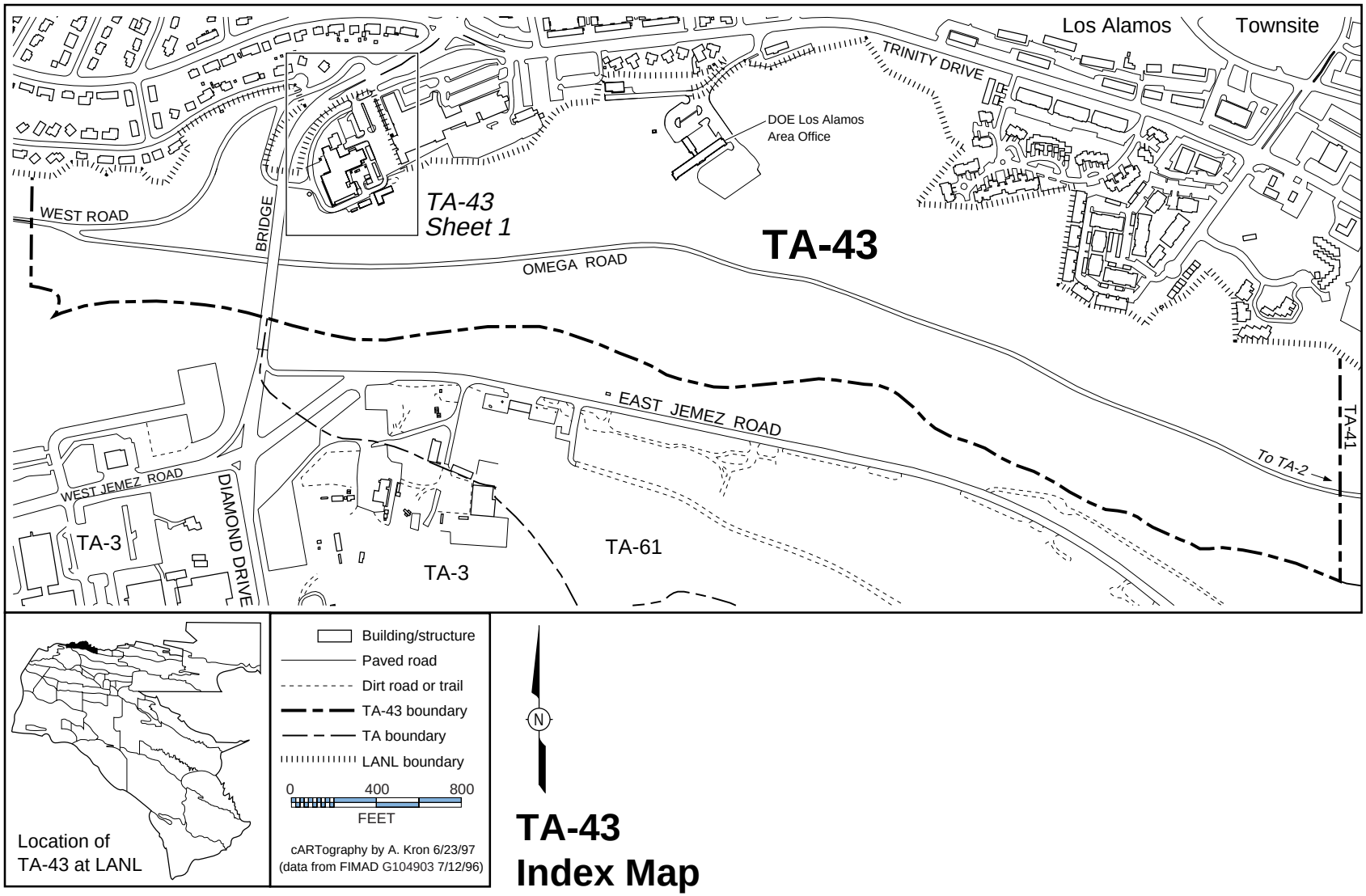


Figure 4-23. Map of TA-43, Health Research Laboratory and DOE-LAAO Headquarters — Index Map.

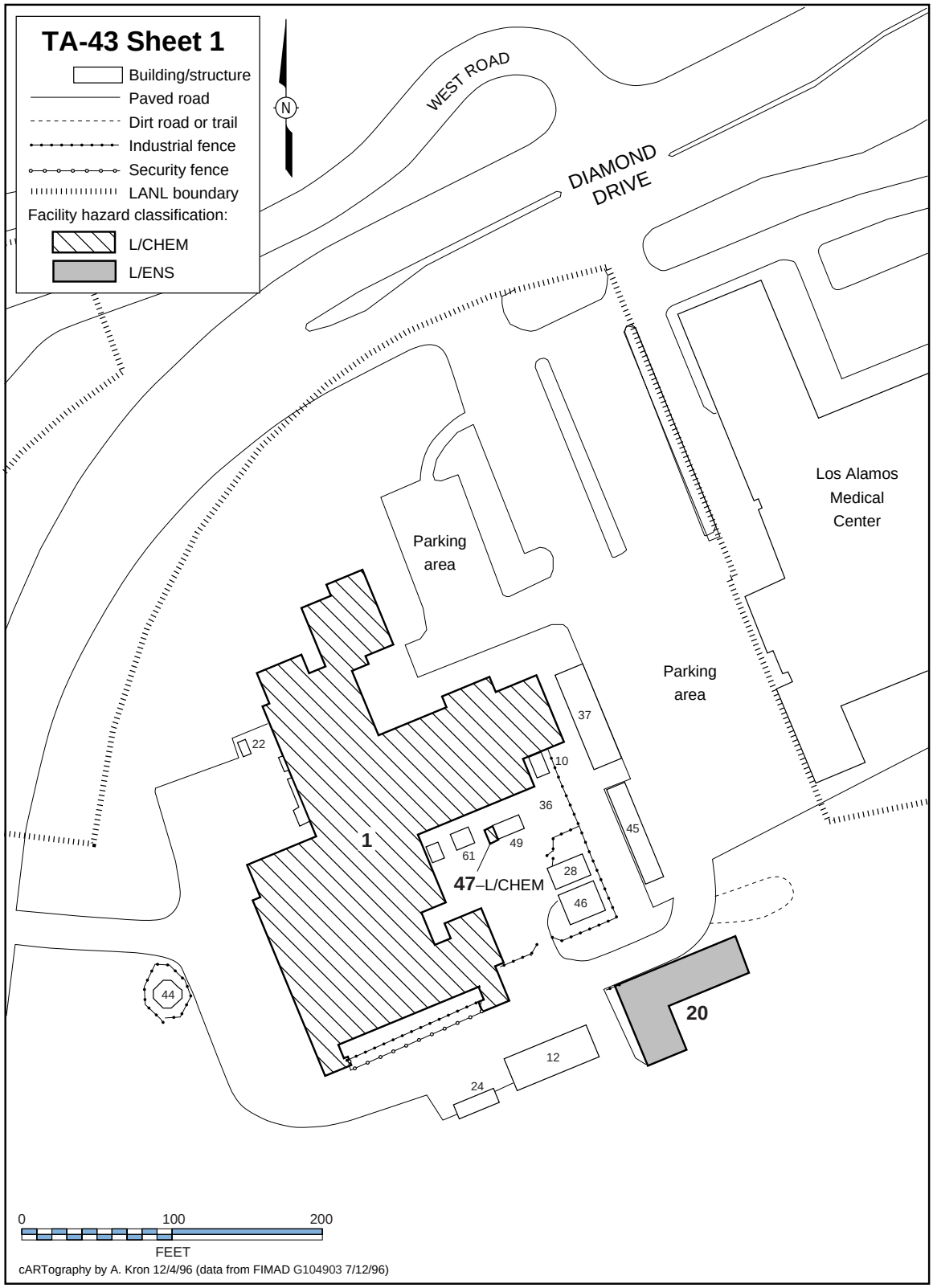


Figure 4-23. Map of TA-43, Health Research Laboratory and DOE-LAAO Headquarters — Sheet 1.

4.24 TA-46, WA SITE

4.24.1 Site Description

TA-46 [Table 4-22 and Figure 4-24 (index map of TA-46)] is one of the Laboratory's basic research sites. Over the years, the operations at this site have focused on applied photochemistry operations and have included development of technologies for laser isotope separation and laser enhancement of chemical processes. The Sanitary Wastewater Consolidation System is located at the east end of this site.

4.24.2 Facilities Description

Because TA-46 is one of the Laboratory's basic research sites, research activities can change frequently. The description of the activities that follows for the various buildings in which research is conducted represents information from the early part of the 1990s. Although it can be expected that similar types of operations occur there currently, such assumptions should be verified.

4.24.2.1 Facility Hazard Categories

Table 4-22 identifies the facilities at TA-46 that fall into a facility hazard category because of the type of operations performed in the facility.

4.24.2.1.1 Nuclear Facility Hazard Categories

No buildings at TA-46 are categorized as nuclear facilities.

4.24.2.1.2 Non-Nuclear Facility Hazard Categories

4.24.2.1.2.1 Building Categorized M/CHEM

The Chlorine Storage Building (Building 340, Figure 4-24, Sheet 1), part of the Sanitary Wastewater Treatment Facility, is the only building at TA-46 categorized M/CHEM.

The Sanitary Wastewater Treatment Facility is located in a canyon in TA-46. Because it is isolated from other Laboratory facilities, it poses little to no hazard to personnel. The facility uses a chlorine gas process (widely used in the public sector) to disinfect plant effluents before releasing them into a holding pond. The process uses quantities of chlorine that exceed Occupational Safety and Health Administration threshold quantities; no other facility at the Laboratory uses this amount of chlorine. Although these quantities are significant, the process is a proven technology that incorporates a state-of-the art, fail-safe process. The effluent-chlorinating system is equipped with influent and effluent chlorinators, chlorinators for water to be recycled, standby chlorinators, cylinder-mounted regulators, and stored cylinders of chlorine. The system contains various fail-safe leak detectors, breathing apparatus, and chlorine cylinder emergency repair kits.

At the time that this document was being prepared, plans were being implemented to replace the chlorine gas process with a new water disinfection process that does not use gaseous chlorine. This change will eliminate the potential for accidental release of large quantities of chlorine.

4.24.2.1.2.2 Building Categorized L/CHEM

Building 324 (Figure 4-24, Sheet 1) is a transportainer used to store uranium hexafluoride.

4.24.2.1.2.3 Buildings Categorized L/ENS

4.24.2.1.2.3.1 Laboratory/Office Building

Building 24 (Figure 4-24, Sheet 1) is used for experimental work involving lasers and UF_6.

4.24.2.1.2.3.2 Electronics Laboratory

The Electronics Laboratory, also called the Hydraulics Laboratory (Building 30, Figure 4-24, Sheet 1), is used for experimental work involving lasers.

4.24.2.1.2.3.3 Test Building #2

Test Building #2 (Building 31, Figure 4-24, Sheet 1) is used for experimental work involving lasers.

4.24.2.1.2.3.4 Aerochemistry/Diagnostics Building

The Aerochemistry/Diagnostics Building, also called the Laser Isotope Separation Building (Building 41, Figure 4-24, Sheet 1), is used for experimental work involving lasers.

4.24.2.1.2.3.5 Laser Laboratory

The Laser Laboratory (Building 76, Figure 4-24, Sheet 1) is used for experimental work involving lasers.

4.24.2.1.2.3.6 Physical Chemistry Laboratory

The Physical Chemistry Laboratory, also called the Applied Photochemistry Building (Building 154, Figure 4-24, Sheet 1), consists of a 5,000-ft^2 (1,524-m^2), prefabricated metal structure primarily used for conducting large-scale photochemical experiments. The experiments performed at this facility involve some hazardous operations and high-powered gas laser energy sources in which toxic and/or corrosive gases are used. High-voltage hazards also are present. Small quantities of high explosives have been used in this facility.

4.24.2.1.2.3.7 Laser-Induced-Chemistry Laboratory

The Laser-Induced-Chemistry Laboratory (Building 158, Figure 4-24, Sheet 1) is used for experimental work involving lasers.

4.24.2.1.2.3.8 Chemistry/Laser Laboratory

The Chemistry/Laser Laboratory, also called the Fourier Transform Spectrometer Facility (Building 200, Figure 4-24, Sheet 1), has an area of 3,340 ft^2 (1,018 m^2) and contains a small laboratory devoted to handling tiny quantities of radioactive materials used for spectroscopic study of atoms and molecules, applied photochemistry, and photophysics. Although Building 200 is the primary location of these functions, several other buildings at TA-46 also accommodate some of these functions.

4.24.2.1.2.3.9 Analytical Chemistry Building

The Analytical Chemistry Building (Building 250, Figure 4-24, Sheet 1) is used for experimental work involving lasers.

4.24.2.1.2.4 Buildings Categorized L/RAD

4.24.2.1.2.4.1 Accelerator Vault Building

The Accelerator Vault Building (Building 161, Figure 4-24, Sheet 1) is used for experimental work involving an accelerator and lasers.

4.24.2.1.2.4.2 Free-Electron Laser Laboratory

The Free-Electron Laser Laboratory (Building 208, Figure 4-24, Sheet 1) is used for experimental work involving a radiofrequency generator (x-rays).

4.24.2.2 Nonhazardous Facilities

One hundred fifteen other buildings at TA-46 are categorized as nonhazardous. These facilities house administrative, technical, general storage, experimental science, and physical support functions.

TABLE 4-22

FACILITIES THAT FALL INTO NUCLEAR AND NON-NUCLEAR HAZARD CATEGORIES TA-46, WA SITE

Facility Number	Building Name	Operations Category	Nuclear Facilities Hazard Categories		Non-Nuclear Facility Hazard Categories					
			Cat. 2	Cat. 3	M/RAD	M/CHEM	L/RAD	L/ENS	L/CHEM	L/ENV
24	Laboratory/Office	Experimental Science						X		
30	Electronics Lab	Experimental Science						X		
31	Test Building 2	Experimental Science						X		
41	Aerochemistry/ Diagnostics Building	Experimental Science						X		
76	Laser Laboratory	Experimental Science						X		
154	Physical Chemistry Laboratory	High Explosives						X		
158	Laser-Induced-Chemistry Laboratory	Experimental Science						X		
161	Accelerator Vault Building	Experimental Science					X			
200	Chemistry/Laser Lab	Experimental Science						X		
208	Free-Electron Laser Laboratory Building	Experimental Science					X			
250	Analytical Chemistry Building	Experimental Science						X		
324	Transportainer	Experimental Science							X	
340	Chlorine Storage Facility	Waste Management				X				

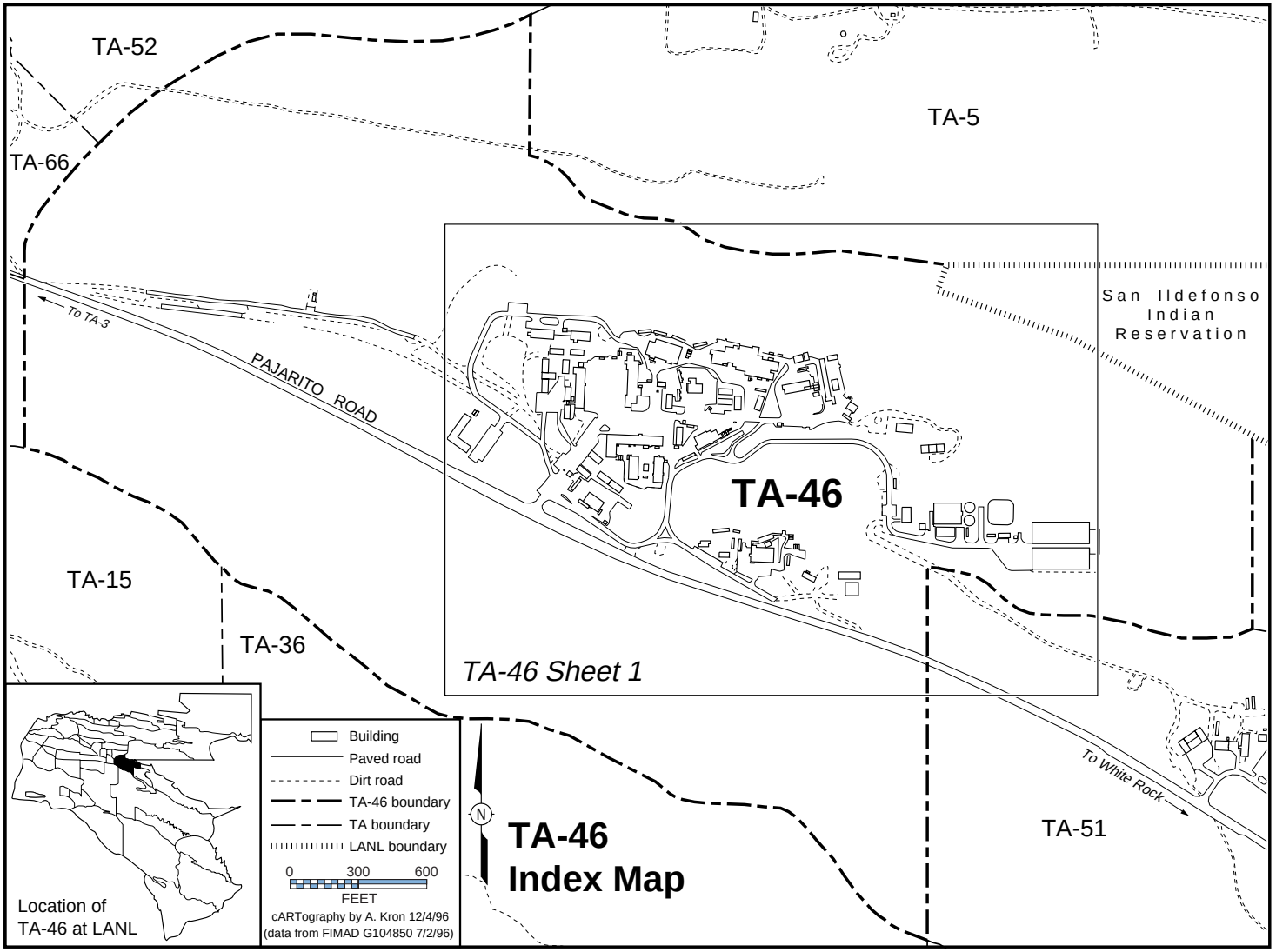


Figure 4-24. Map of TA-46, WA Site—Index Map.

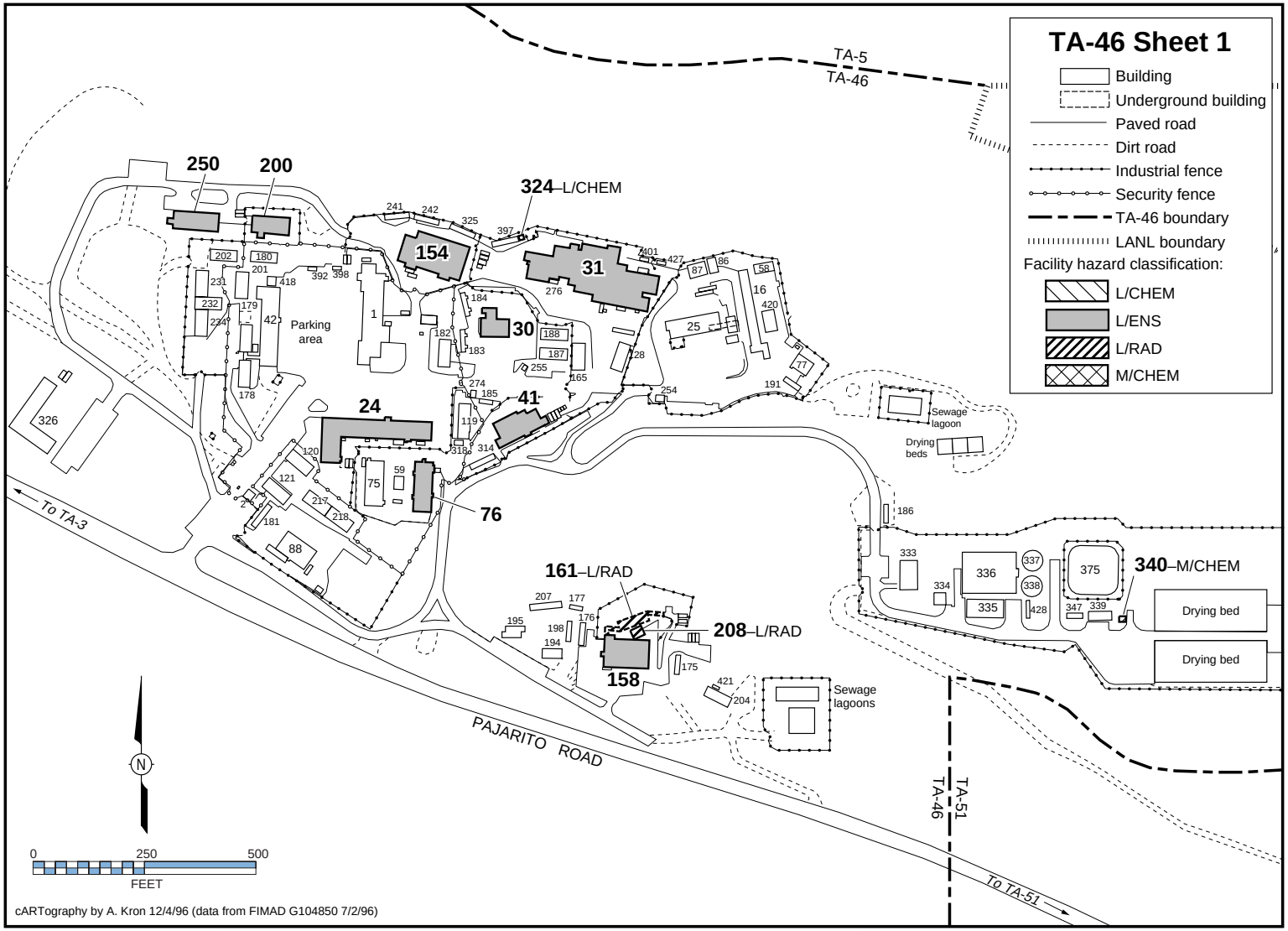


Figure 4-24. Map of TA-46, WA Site—Sheet 1.

4.25 TA-48, Radiochemistry Site

4.25.1 Site Description

The Radiochemistry Site [Table 4-23 and Figure 4-25 (index map of TA-48)] is an R&D facility established and constructed between 1955 and 1957. It is located 1.1 mi (1.77 km) from the TA-3 Administration Building on an unnamed access road, just off Pajarito Road and immediately northeast of TA-55. The entire technical area covers 115.9 acres (46.9 ha), and the main buildings are located in an 8.59-acre (3.48-ha) area enclosed behind a security fence.

4.25.2 Facilities Description

The facilities at TA-48 support research and development in nuclear and radiochemistry. Measurements of radioactive substances are taken in hot cells equipped for remote handling of radioactive materials. Although radiochemical operations are conducted primarily in Buildings 1, 8, 28, 45, and 107, only Building 1 contains sufficient radioactive materials to be considered hazardous. All remaining buildings are devoted to administrative and technical activities.

4.25.2.1 Facility Hazard Categories

Table 4-23 identifies the facilities within TA-48 that fall into a facility hazard category because of the type of operations performed in the facility.

4.25.2.1.1 Nuclear Facility Hazard Categories

Although Building 1, Radiochemistry Laboratory (Figure 4-25, Sheet 1), is currently categorized as a L/RAD, it is a candidate for nuclear facility status. Therefore, it will be discussed here as a Hazard Category 3 nuclear facility.

The majority of TA-48's radiochemistry R&D, medical radioisotope production, development of waste management technologies, and counting room operations take place in Building 1. The building is divided into an office wing, light-chemistry laboratories for performing low-level radiochemistry, a hot-cell complex to produce medical radioisotopes, an alpha wing used for processing alpha-emitting radioactive and toxic materials, and a counting room complex. There is also a secure-data wing with a classified computer and vault containing historical weapons data.

Activities at Building 1 include small-scale radiochemistry in the laboratories area, chemical research of high-alpha-activity materials in the alpha facility, final analysis of samples in the counting room, and small-scale production of medical radioisotopes in the hot-cells area.

This building is a single-story structure with a basement. The exterior walls are constructed of various materials, including masonry, stucco, block, and metal siding. The roof is a flat, built-up design. Most radiochemical operations are conducted on the main floor. The basement is used for limited radiochemical activities, chemical storage, and facility utilities and support systems.

Compressor systems supply air for laboratory processes and instrumentation. The main components of the ventilation system date from the original building. Additional dedicated systems are provided for the hot cells and dissolution areas. Exhaust fans are located in the basement and exhaust through roof stacks. The alpha facility and hot-cells areas are ventilated by a HEPA filter system. A redundant exhaust system is provided for the hot-cells areas.

The dissolution area houses a high-activity-chemistry area. The activities conducted here involve the largest amounts of beta-gamma radioactivity outside of the hot-cells area. Most of the debris analyzed at TA-48 is transported in Department of Transportation (DOT) Type B containers. Since

the moratorium on nuclear testing, activities in this area primarily consist of high-activity-chemistry research.

The laboratory area in Building 1 contains space for small-scale radiochemistry that supports the medical radioisotopes program. A vacuum system is provided for counting equipment, fixed-head air monitors, and drying processes. Other laboratory space is used for research in inorganic chemistry, actinide chemistry, organometallic chemistry, environmental chemistry, and geochemistry.

The Alpha Facility in the northeast portion of Building 1 consists of several rooms designated as controlled areas. The facility houses those activities involving the largest amounts of alpha radioactivity and other offices and ancillary areas.

The counting rooms are in the east end of the building. This area contains a mix of low-level radiation detectors and counting systems for quantitatively evaluating radioactive samples from the various weapons, medical, and environmental programs. The counting systems measure radioactive emissions of alpha, beta, gamma, and x-rays and also function as fission detectors.

The hot-cells area is used for small-scale production of selected radioisotopes for various medical and research purposes. Target materials that have been irradiated to produce desired radionuclides are required to be processed in a series of interconnected and highly shielded hot cells. Hot-cell activities can involve both radioactive and toxic materials. Toxic materials are present in such small quantities that they present little or no concern for explosive accidents. Quantities of radioactive materials are substantially larger; however, the hot cells feature substantial shielding and various safety systems and alarms, which together mitigate the potential for accidents.

4.25.2.1.2 Non-Nuclear Facility Hazard Categories

No buildings at TA-48 have been categorized as non-nuclear facilities.

4.25.2.2 Nonhazardous Facilities

4.25.2.2.1 Isotope Separator Facility

Operations at the Isotope Separator Facility (Building 8, Figure 4-25, Sheet 1) include isotope separation from element samples, which involves separating and collecting radioactive isotopes for analytical quantification and developing equipment used for isotope separation. Separated and collected isotope samples are used in ongoing Laboratory research programs.

4.25.2.2.2 Diagnostic Instrumentation and Development Facility

The Diagnostic Instrumentation and Development Facility (Building 28, Figure 4-25, Sheet 1) contains two laboratories. One lab houses five laser systems and two mass spectrometers used for environmental research experiments. The other lab is used for processing water samples from locations where radioactive contamination is present.

4.25.2.2.3 Advanced Radiochemical Diagnostics Facility

The Advanced Radiochemical Diagnostics Facility (Building 45, Figure 4-25, Sheet 1) contains 11 chemistry and 7 instrument laboratories. These laboratories are Class 100 clean-room areas designed to minimize the effect of environmental factors on the accuracy of isotope ratio measurements. The wide range of operations at this facility includes isotope ratio measurements from experiments in solar physics, geosciences, biology, and atmospheric science.

4.25.2.2.4 Analytical Facility

The Analytical Facility (Building 107, Figure 4-25, Sheet 1) contains four light-chemistry laboratories and a laser laboratory. Operations in this facility support environmental research programs, catalysis research, and inorganic chemistry.

TABLE 4-23

FACILITIES THAT FALL INTO NUCLEAR AND NON-NUCLEAR HAZARD CATEGORIES
TA-48, RADIOCHEMISTRY SITE

Facility Number	Building Name	Operations Category	Nuclear Facilities Hazard Categories		Non-Nuclear Facility Hazard Categories					
			Cat. 2	Cat. 3	M/RAD	M/CHEM	L/RAD	L/ENS	L/CHEM	L/ENV
1	Radiochemistry Laboratory	Experimental Science		X						

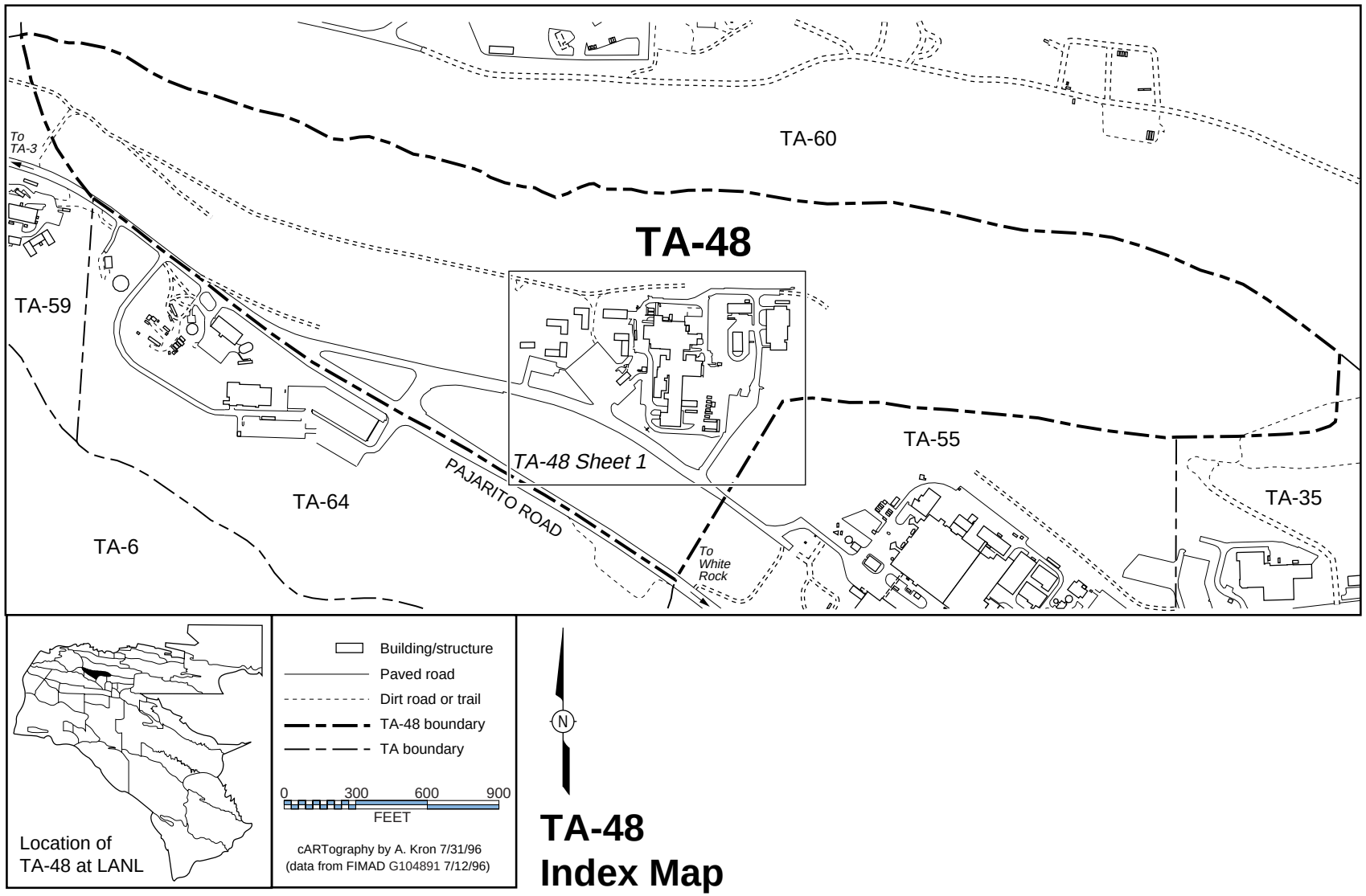


Figure 4-25. Map of TA-48, Radiochemistry Site—Index Map.

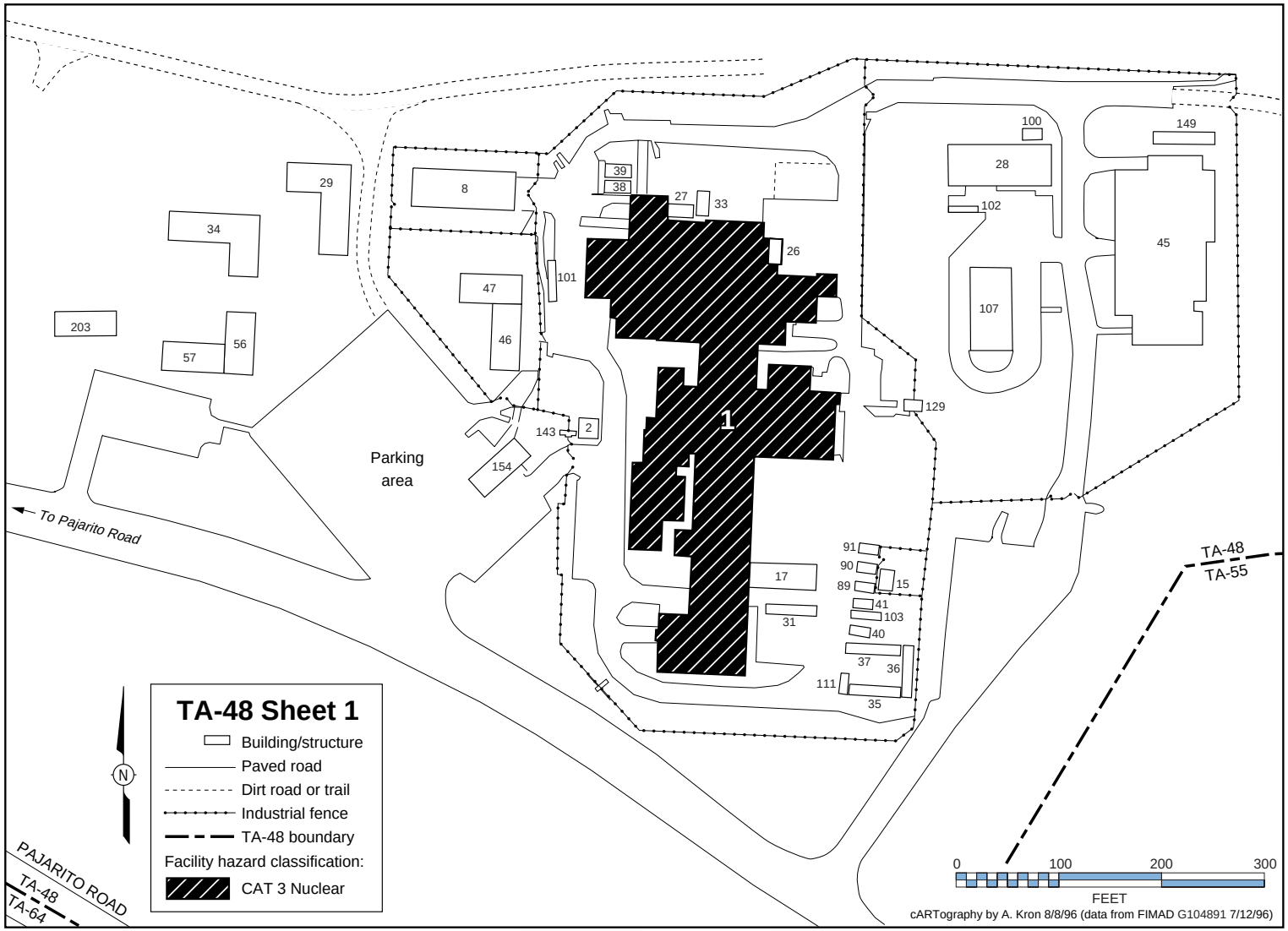


Figure 4-25. Map of TA-48, Radiochemistry Site—Sheet 1.

4.26 TA-49, Frijoles Mesa Site

4.26.1 Site Description

Because the Frijoles Mesa Site [Table 4-24 and Figure 4-26 (index map of TA-48)] is located near Bandelier National Monument, activities conducted there are restricted to carefully selected Laboratory functions. Currently, the Laboratory's Hazardous Devices Team uses the site as a training area and as an isolated location for blowing up suspect packages. The site is also the location of the Laboratory's Antenna and Pulse Power Outdoor Range User Facility, where a spectrum of outdoor tests is carried out on materials and equipment components that involve generating and receiving short bursts of high-energy, broad-spectrum microwaves.

TA-49 is surrounded by a locked security fence, which prevents accidental intrusion. When experiments are conducted, personnel install barriers that exclude any individuals from access to areas where unsafe levels of energy could be encountered.

In 1960 and 1961, a series of experiments involving high explosives and radioactive materials was conducted at the site. These experiments, which were primarily designed to improve the understanding of certain safety aspects of operational nuclear weapons, were conducted underground in large-diameter holes as deep as 120 ft (36.6 m). The Laboratory report, Environmental Status of Technical Area 49, Los Alamos, New Mexico (LANL 1987), provides more information.

4.26.2 Facilities Description

4.26.2.1 Facility Hazard Categories

Table 24 identifies the facilities at TA-49 that fall into a facility hazard category because of the type of operations performed in the facility.

4.26.2.1.1 Nuclear Facility Hazard Categories

No buildings at TA-49 are categorized as nuclear facilities.

4.26.2.1.2 Non-Nuclear Facility Hazard Categories

Three facilities at TA-49 (Buildings 0, 128, and 130) are categorized L/ENS. Buildings 0, 128, and 130 are portable trailers and therefore do not appear on Figure 4-26. These trailers contain equipment being used for a microwave experiment.

4.26.2.2 Nonhazardous Facilities

Nine facilities at TA-49, consisting of general storage sheds, trailers, and semitrailers used by the Hazardous Devices Team, are categorized as nonhazardous.

TABLE 4-24

FACILITIES THAT FALL INTO NUCLEAR AND NON-NUCLEAR HAZARD CATEGORIES
TA-49, FRIJOLES MESA SITE

Facility Number	Building Name	Operations Category	Nuclear Facilities Hazard Categories		Non-Nuclear Facility Hazard Categories					
			Cat. 2	Cat. 3	M/RAD	M/CHEM	L/RAD	L/ENS	L/CHEM	L/ENV
0*	Microwave Test Equipment	Experimental Science						X		
128*	Semitrailer	Experimental Science						X		
130*	Semitrailer	Experimental Science						X		

*These buildings do not show up on the maps.

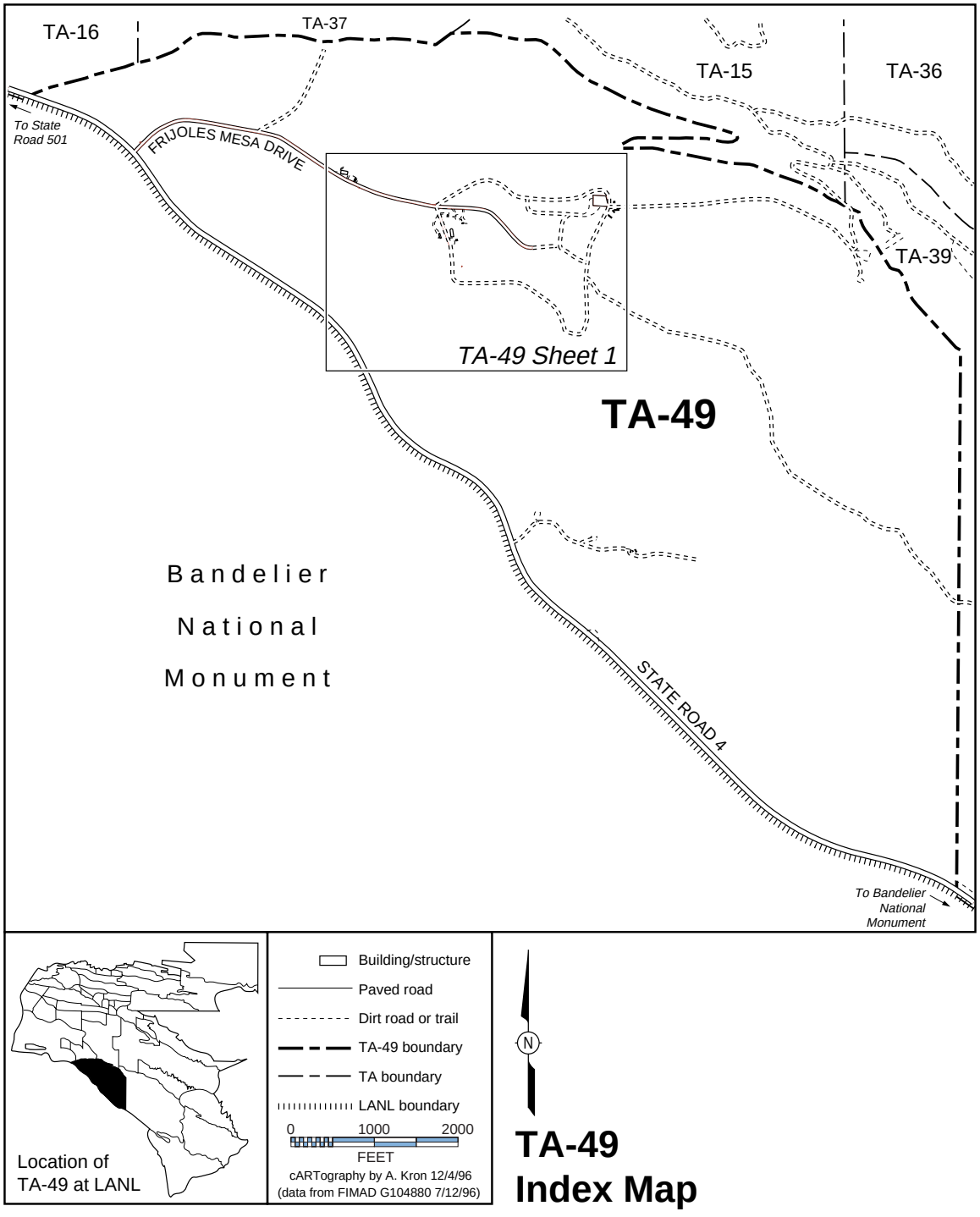


Figure 4-26. Map of TA-49, Frijoles Mesa Site—Index Map.

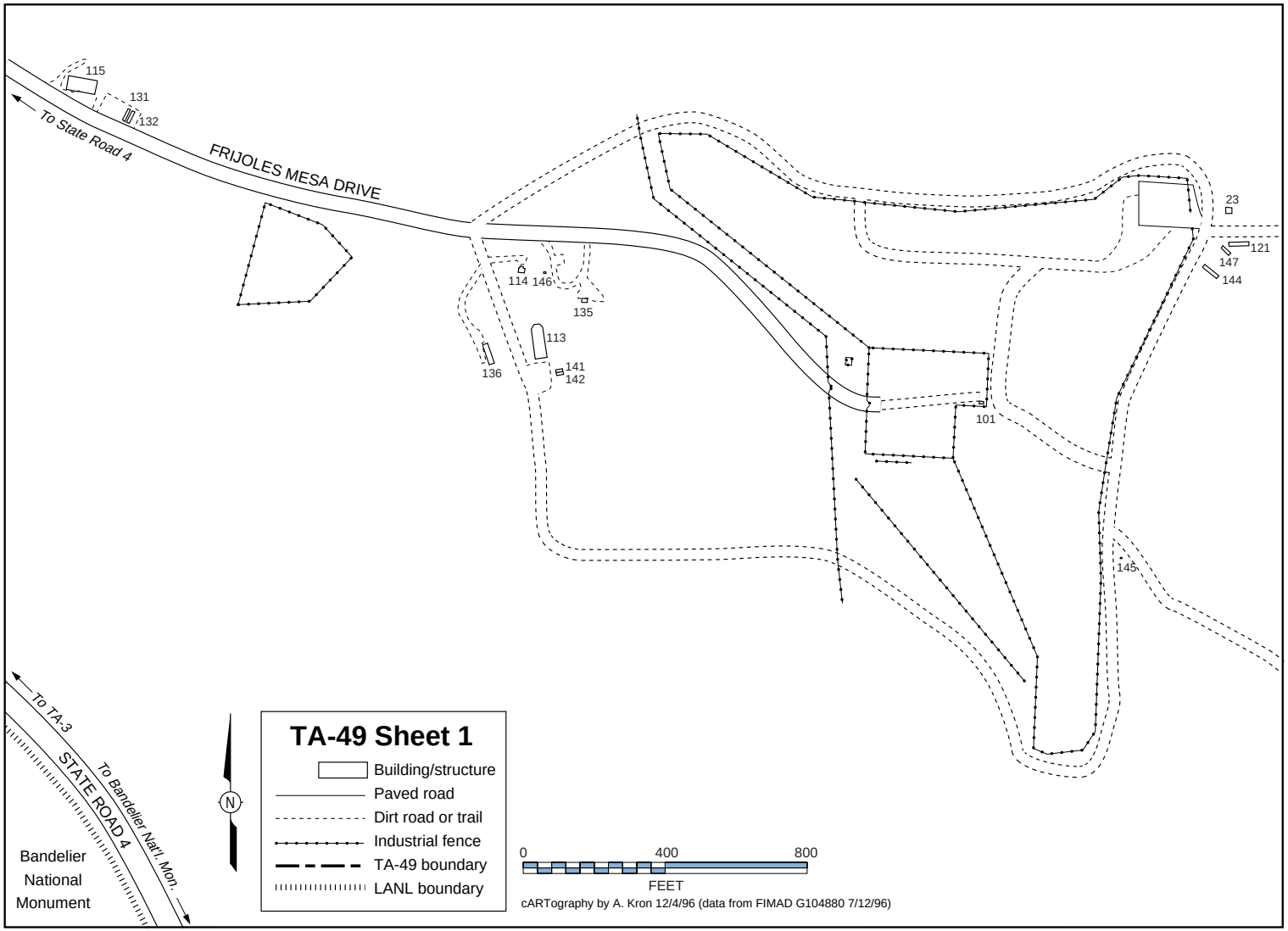


Figure 4-26. Map of TA-49, Frijoles Mesa Site—Sheet 1.

4.27 TA-50, Waste Management Site

4.27.1 Site Description

TA-50 is located near the center of the Laboratory [Table 4-25 and Figure 4-27 (index map of TA-50)]. The site contains 33 waste management structures, including office trailers, tanks, storage sheds, and four buildings.

Approximately 110 persons participate in the following waste management activities:

- treating radioactive liquid waste;
- decontaminating respirators, equipment, instruments, vehicles, and waste items;
- reducing the size of transuranic wastes; and
- characterizing transuranic wastes.

4.27.2 Facilities Description

The facilities at TA-50 support the Laboratory's waste management activities for several types of waste, including storing or disposing of solid and liquid, low-level radioactive waste (LLW), low-level mixed waste, transuranic (TRU) waste, and hazardous waste. The major facilities at TA-50 are the Radioactive Liquid Waste Treatment Facility (RLWTF); Waste Characterization, Reduction, and Repackaging Facility (WCRRF), formerly known as the Size Reduction Facility; and the Radioactive Materials Research, Operations, and Demonstration (RAMROD) Facility, formerly known as the Controlled Air Incinerator (CAI).

4.27.2.1 Facility Hazard Categories

Table 4-25 identifies the facilities at TA-50 that fall into a facility hazard category because of the type of operations performed in the facility.

4.27.2.1.1 Nuclear Facility Hazard Categories

Two buildings at TA-50 are categorized as Hazard Category 2 nuclear facilities.

4.27.2.1.1.1 Radioactive Liquid Waste Treatment Facility

The RLWTF (Building 1, Figure 4-27, Sheet 1) provides waste treatment services for organizations throughout the Laboratory, including concentrating radioactive components and removing them from liquid waste. Pipelines throughout the Laboratory connect facilities to the RLWTF. The RLWTF also includes wastewater analytical laboratories, environmental chemistry laboratories, and associated decontamination operations and holding tanks. The 40,000-ft^2 (12,192 m^2) RLWTF is composed of the following areas: radioactive liquid waste treatment areas, wastewater analytical laboratories, environmental chemistry laboratories, decontamination operations, and several holding tanks.

The original structure of the RLWTF is reinforced concrete and pumice block walls with steel joists for roof support. Various additions to the original facility are of prefabricated metal construction with steel framing and insulated metal roofing and siding. The basic shell of the structure surrounds the facility and protects the environment from dispersal of any radioactive or hazardous materials. The storage and treatment areas in this facility have several features to prevent leaks, spills, and overflows of radioactive and hazardous materials from reaching the environment: curbs, underground location, and overflow pipes to nearby tanks and/or floor drains leading to holding tanks.

Two waste treatment operations are housed in the RLWTF: a main treatment operation and a pretreatment operation for acid and caustic radioactive liquid wastes piped from TA-55 (the Plutonium Facility). The main liquid waste treatment operation includes two clariflocculators operated in series and five concrete holding tanks with a pumping station, which form the underground concrete structure designated as Building 2. An additional steel holding tank (Building 90) provides extra capacity for incoming, untreated radioactive liquid waste. Influents are transported to the RLWTF in a passive, gravity-fed pipeline system made up of a network of four major pipelines that run to various parts of the Laboratory. All waste transfer piping is double-encased (except for a cross-country line from TA-21 and TA-2) to mitigate the possibility of release of radioactive materials. Sludge from the RLWTF is dewatered, drummed, and transported to TA-54 for disposal. The south wing of the basement houses equipment for decontaminating personnel respirators, vehicles, large equipment such as drill rigs, and other equipment such as gloveboxes. Decontamination solutions drain to influent tanks for LLW operations.

The acid and caustic wastes generated at TA-55 generally have much higher americium and plutonium content than other wastes processed at RLWTF. The pretreatment operation for these wastes is similar to the main treatment operation, except that a single, smaller clariflocculator unit is used. Special lines transport the acid and caustic wastes generated at TA-55 to the RLWTF. An underground, reinforced-concrete vault (Building 66) contains two tanks that hold untreated acid and caustic wastes from TA-55.

Laboratories in a portion of RLWTF characterize samples of influent and effluent obtained from liquid waste treatment operations, and small amounts of samples and chemicals are stored in this portion of the facility. Other analytical laboratories equipped with spectrometers and counting instruments analyze environmental media, particularly soil samples. Samples and chemicals are stored in small quantities in this area.

A variety of decontamination operations are performed in a high bay in the RLWTF. Equipment of all sizes is cleaned by means of acids, steam, water, or nonhazardous commercial cleaners. Liquid discharged from decontamination operations is piped to Building 2.

4.27.2.1.1.2 Waste Characterization, Reduction, and Repackaging Facility

The WCRRF (Building 69, Figure 4-27, Sheet 1) is a one-story building with a floor area of 2,712 ft^2 (827 m^2). The exterior load-bearing walls are constructed of structural steel framing with an insulated plastic veneer finish, and the floor is a reinforced-concrete slab on compacted fill. The roof and mezzanine are constructed of reinforced concrete over steel joists and metal decking.

The WCRRF consists of two independent segments. The exterior segment, adjacent to Building 69, consists of a container storage area and a storage tank for liquid waste. The interior of Building 69 houses waste characterization, reduction, and repackaging operations. The physical barriers provided by the building, the waste containers, and the facility's administrative controls ensure that materials in the two segments cannot interact.

DOT Type 7A drums are staged in the container storage area until they are moved into the building to be characterized. All of the drums in the storage area contain only solid waste and are covered to prevent rain water intrusion. A portable liquid waste storage tank holds water from decontamination activities performed in this area until the water can be transported to the RLWTF for treatment.

The interior of the facility consists of a vehicle air-lock area, an unpacking/welding area, a partial mezzanine area, and a high-bay area that houses a large glovebox enclosure. A large open area around the enclosure provides the space for support functions, as well as an additional level of containment and radiation protection. The glovebox enclosure occupies 452 ft^2 (138 m^2) of floor

area and is constructed of stainless steel with an external skeleton of mild-steel rectangular tubing. The enclosure in which gloveboxes and other waste items are cut apart with a plasma torch is divided into air-lock, disassembly, cutting, and packaging/bag-out modules, which are bolted together and seal-welded.

The glovebox enclosure, air locks, and waste containers are the primary containment systems in the WCRRF. The glovebox enclosure provides the primary confinement system. The glovebox is maintained at a negative pressure with respect to the building, and the building is maintained at negative pressure with respect to the outside environment.

Waste packages arrive at the receiving area, which is equipped with a vehicle air lock isolated from both the outside environment and the interior unpacking area. A set of vehicle air-lock doors and glovebox enclosure air-lock doors are electronically interlocked so that the two sets of doors cannot be opened simultaneously, which ensures that the facility containment system is not breached. The waste containers also provide an effective containment system. Bulky waste materials arrive packaged inside a fire-retardant, fiberglass-reinforced plywood crate, which is custom-built to fit around the waste items. Waste containers with processed TRU waste are placed in metal containers for solid wastes (solid waste boxes). These solid waste boxes are sealed with a metal lid secured by 42 flathead bolts and are then transported to TA-54 for retrievable storage and subsequent shipment to a long-term-storage facility.

The WCRRF cuts apart TRU-contaminated, large-volume metallic items (e.g., gloveboxes) and repackages the pieces in containers for storage and eventual shipment to a long-term-storage facility. Another operation is the visual inspection of the contents of TRU waste drums that have already been characterized. A variety of solid wastes (e.g., laboratory trash and solidified liquid) are accepted for characterization, as well as hazardous and mixed wastes, which are not generated at WCRRF but are received from other Laboratory facilities.

Activities at the WCRRF generate various types of gaseous, liquid, and solid wastes. Routine operations at WCRRF produce significant quantities of TRU waste and LLW, including TRU waste generated by reduction and repackaging activities. LLW is packaged and transported to TA-54 for proper disposal, and TRU waste is packaged and transported to TA-54, Area G, for interim storage until it can be shipped to a long-term-storage facility.

Hazardous gases may be produced by activities such as plasma-torch cutting and welding; however, radioactive gases are not produced by WCRRF activities. Routine operations at the WCRRF produce minor amounts of radioactive liquid waste, which are transported to the RLWTF for treatment, but no hazardous or mixed-waste liquids are generated at the WCRRF.

4.27.2.1.2 Non-Nuclear Facility Hazard Categories

One building at TA-50 (RAMROD, Building 37, Figure 4-27, Sheet 1) is categorized as L/RAD. Formerly known as the Controlled Air Incinerator (CAI), the RAMROD facility was initially developed to demonstrate combustion-based volume reduction and chemical stabilization of TRU-contaminated solid wastes and polychlorinated biphenyls (PCBs). Subsequent process modifications have extended the CAI process to successfully treat other waste streams, including solid and liquid low-level combus-tible wastes, mixed waste, PCBs, and hazardous chemical wastes.

The RAMROD facility is currently categorized as L/RAD; however, it is a candidate Hazard Category 2 nuclear facility. Equipment for characterizing TRU waste and for treating low-level mixed waste will be installed, beginning in FY97. This facility is also a general host for any other process that requires the containment and controls of a candidate nuclear facility.

4.27.2.2 Nonhazardous Facilities

The other facilities at TA-50, consisting of office trailers, storage sheds, a pump station, and a guard station, are categorized as being nonhazardous.

TABLE 4-25

FACILITIES THAT FALL INTO NUCLEAR AND NON-NUCLEAR HAZARD CATEGORIES
TA-50, WASTE MANAGEMENT SITE

Facility Number	Building Name	Operations Category	Nuclear Facilities Hazard Categories		Non-Nuclear Facility Hazard Categories					
			Cat. 2	Cat. 3	M/RAD	M/CHEM	L/RAD	L/ENS	L/CHEM	L/ENV
1	Radioactive Liquid Waste Treatment Facility	Waste Management	X							
37	Radioactive Materials Research Operations and Demonstration Facility	Waste Management					X			
69	Waste Characterization, Reduction, and Repackaging Facility	Waste Management	X							

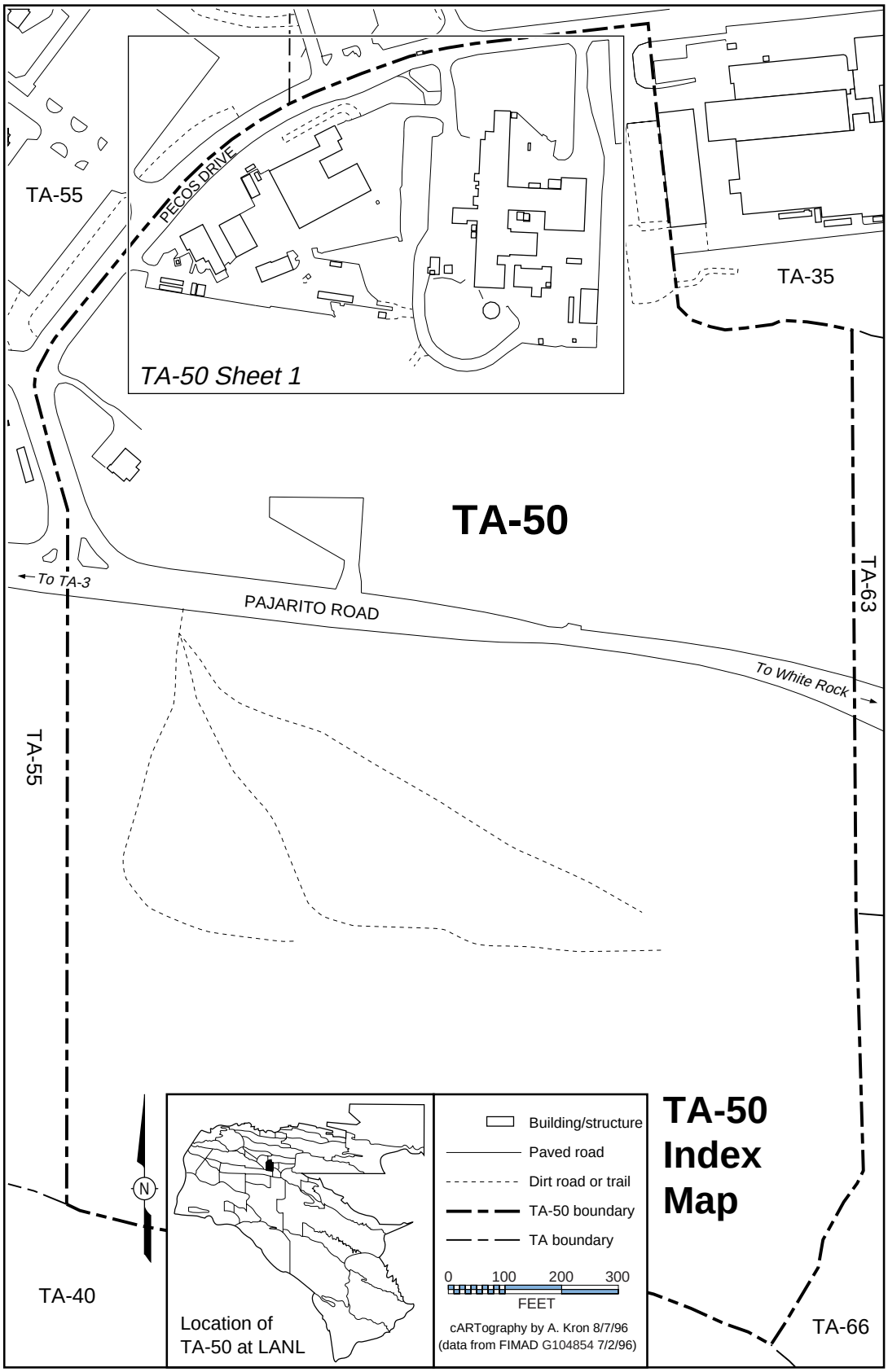


Figure 4-27. Map of TA-50, Waste Management Site—Index Map.

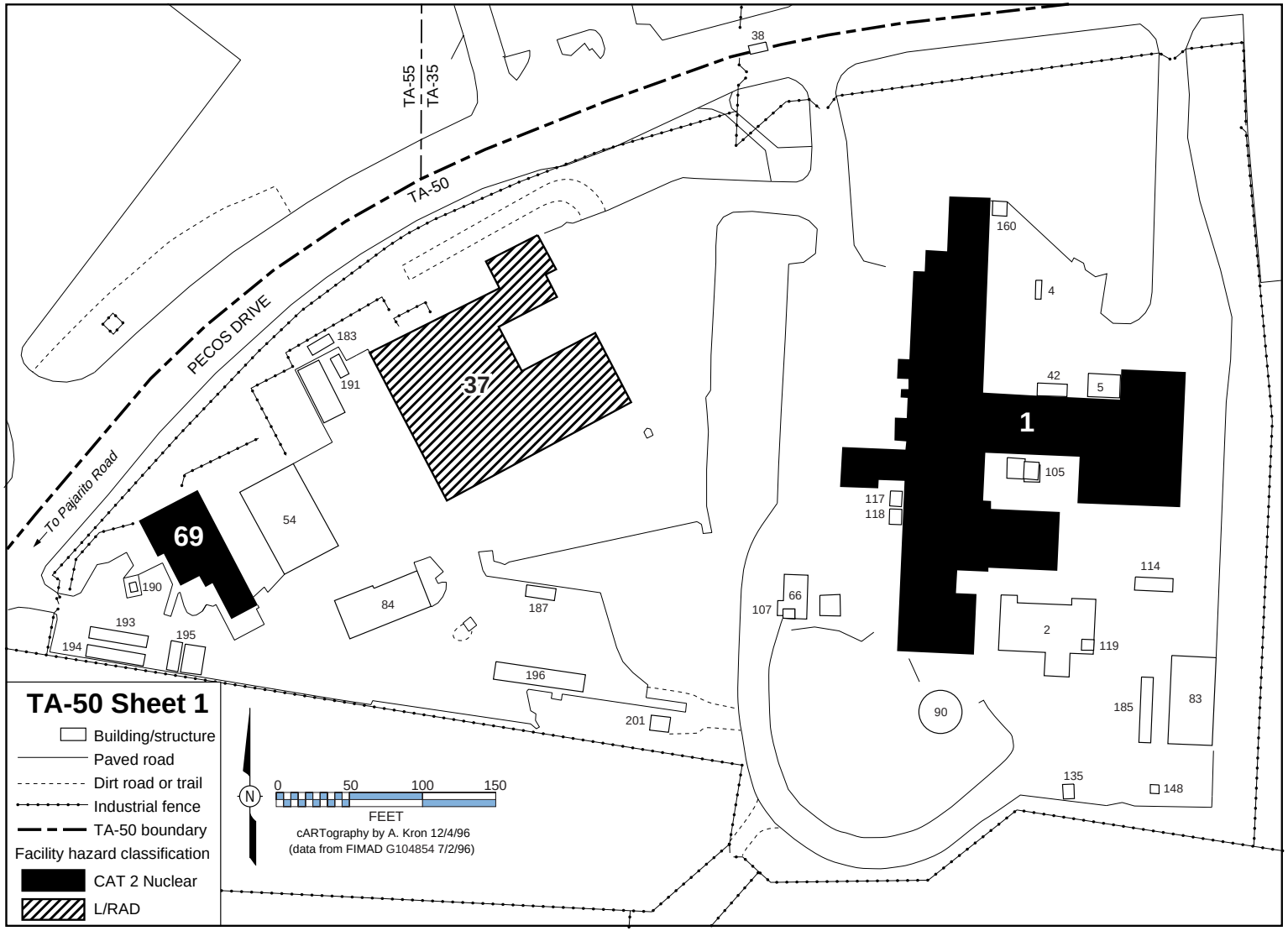


Figure 4-27. Map of TA-50, Waste Management Site—Sheet 1.

4.28 TA-51, Environmental Research Site

4.28.1 Site Description

Located on Pajarito Road, TA-51 is used for research and experimental studies on the long-term impact of radioactive waste on the environment. Various types of waste storage and coverings are studied at this site. TA-51 [Figure 4-28 (index map of TA-51)] is a relatively small technical area located near the eastern border of the Laboratory, approximately 300 ft (91 m) from Pajarito Road.

4.28.2 Facilities Description

4.28.2.1 Facility Hazard Categories

4.28.2.1.1 Nuclear Facility Hazard Categories

No buildings at TA-51 are categorized as nuclear facilities.

4.28.2.1.2 Non-Nuclear Facility Hazard Categories

No buildings at TA-51 are categorized as non-nuclear facilities.

4.28.2.2 Nonhazardous Facilities

The facility contains 17 structures (Figure 4-28, Sheet 1) that provide a total of 21,125 ft^2 (6,439 m^2) of space. Most of the structures are transportables and trailers used for administrative offices. Buildings 11 and 12 are laboratories. All the structures are listed as containing nonhazardous activities.

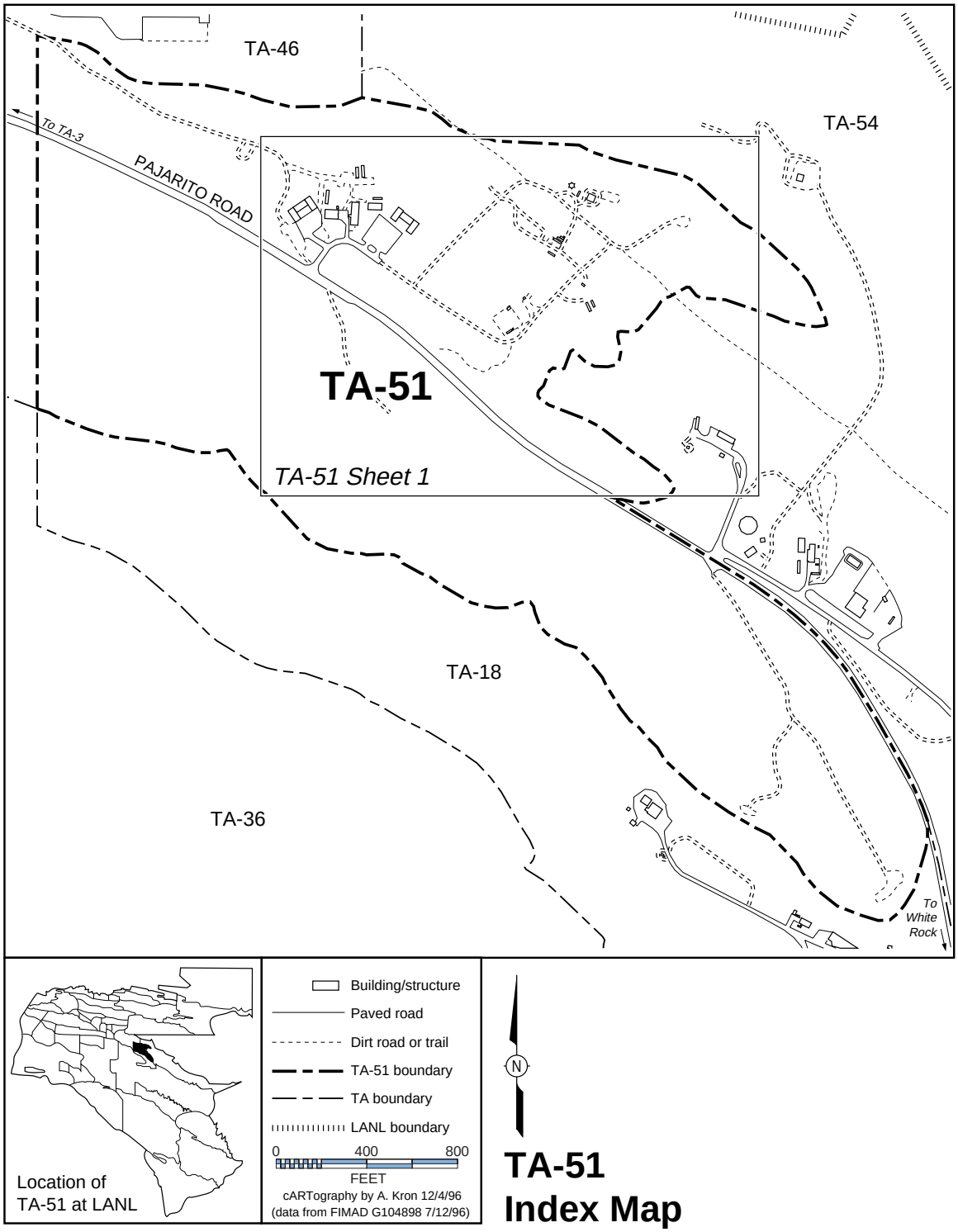


Figure 4-28. Map of TA-51, Radiation Exposure Facility—Index Map.

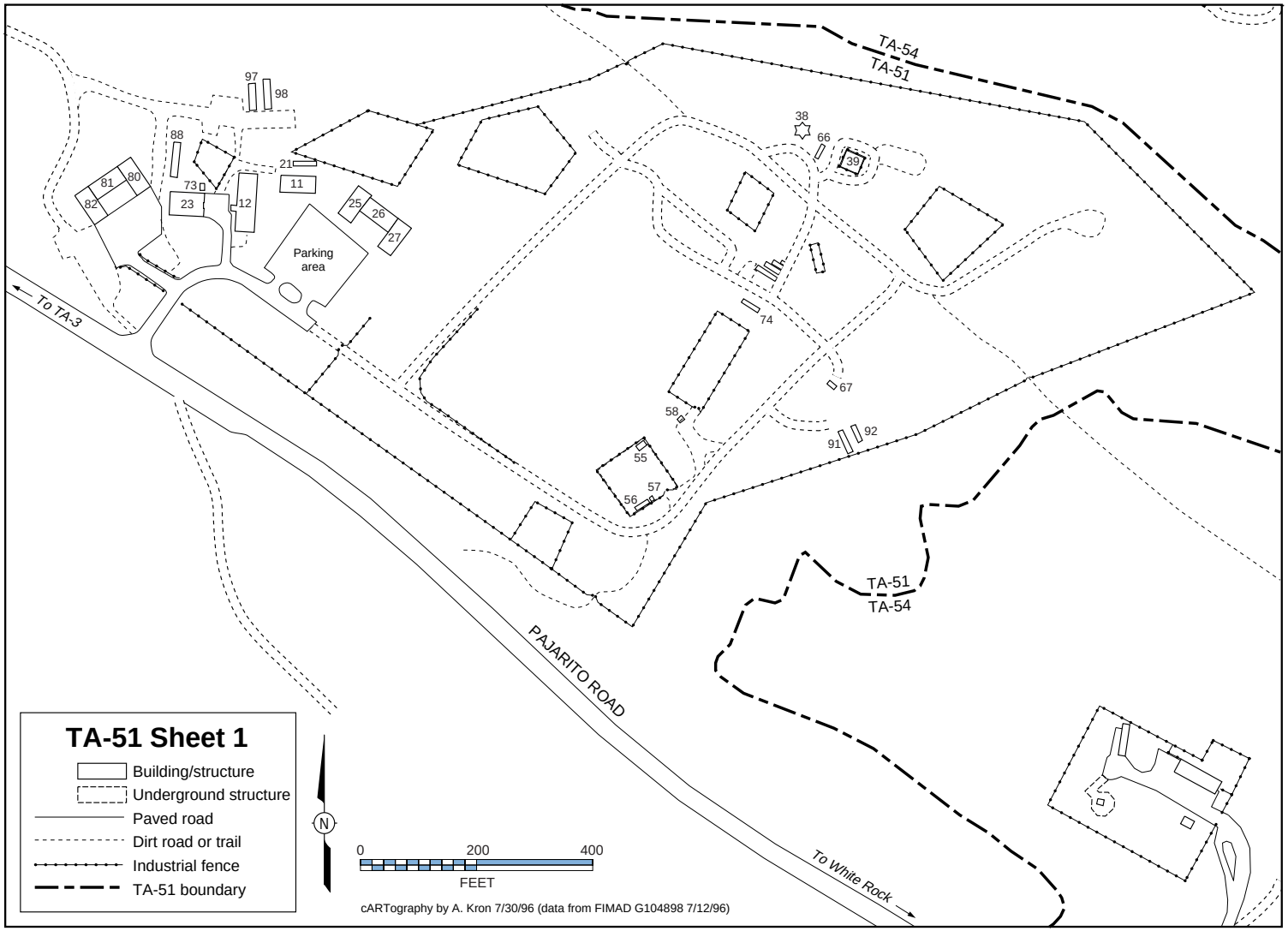


Figure 4-28. Map of TA-51, Radiation Exposure Facility—Sheet 1.

4.29 TA-52, Reactor Development Site

4.29.1 Site Description

A wide variety of theoretical and computational R&D activities related to nuclear reactor performance and safety, as well as to several environment, safety, and health activities, are carried out at the Reactor Development Site [Figure 4-29 (index map of TA-52)]. The work carried out at this site involves both classified and unclassified activities. Classified work is carried out in an area of the site protected by a security fence.

4.29.2 Facilities Description

4.29.2.1 Facility Hazard Categories

4.29.2.1.1 Nuclear Facility Hazard Categories

Currently, no buildings at TA-52 are categorized as nuclear facilities. At one time, TA-52 housed a reactor, which has been dismantled. The building it once occupied has been decontaminated and is used for offices and research activities.

4.29.2.1.2 Non-Nuclear Facility Hazard Categories

No buildings at TA-52 are categorized as non-nuclear facilities.

4.29.2.2 Nonhazardous Facilities

The site (Figure 4-29, Sheet 1) has 22 buildings, trailers, and structures, all categorized as nonhazardous.

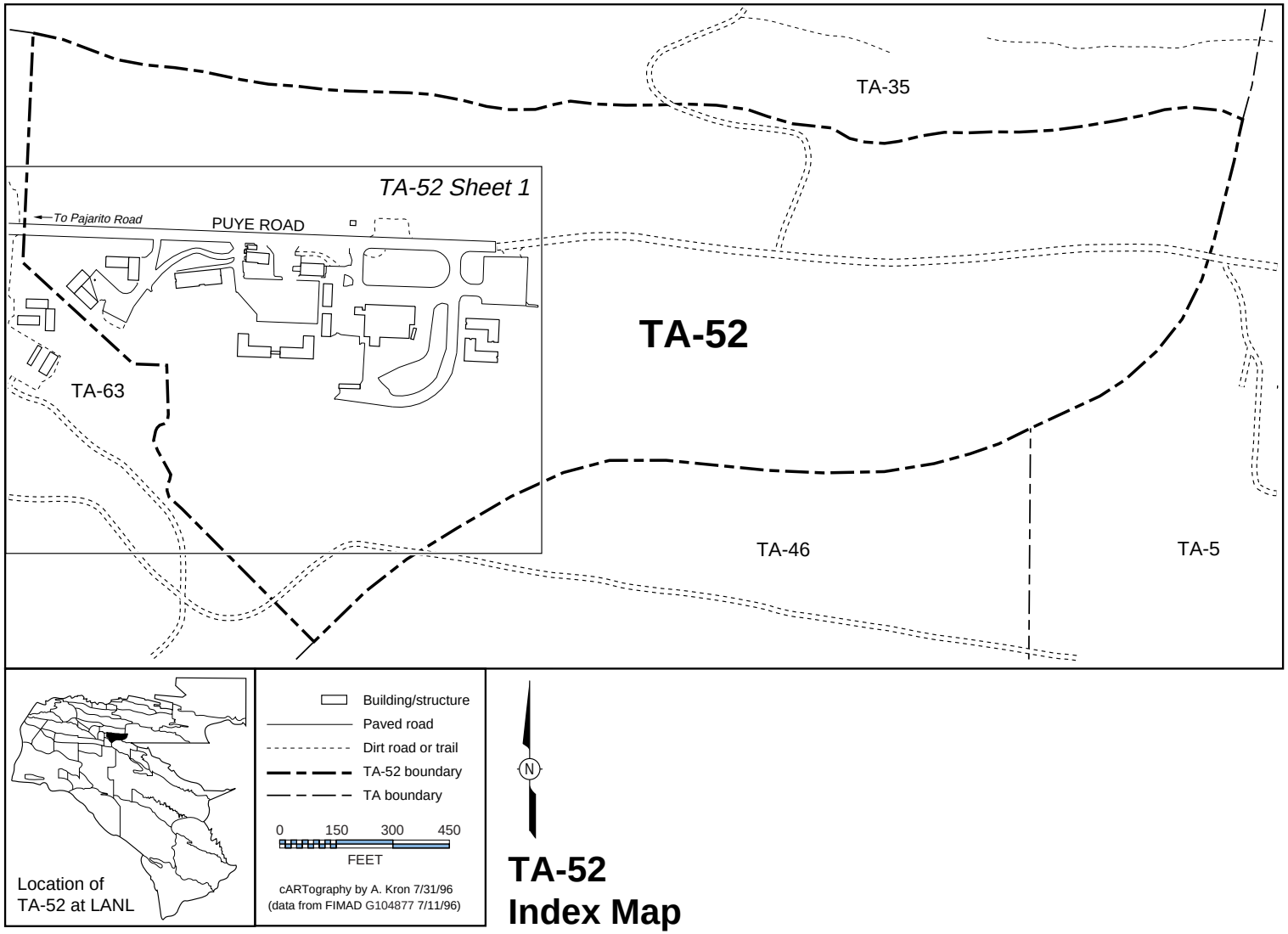


Figure 4-29. Map of TA-52, Reactor Development Site—Index Map.

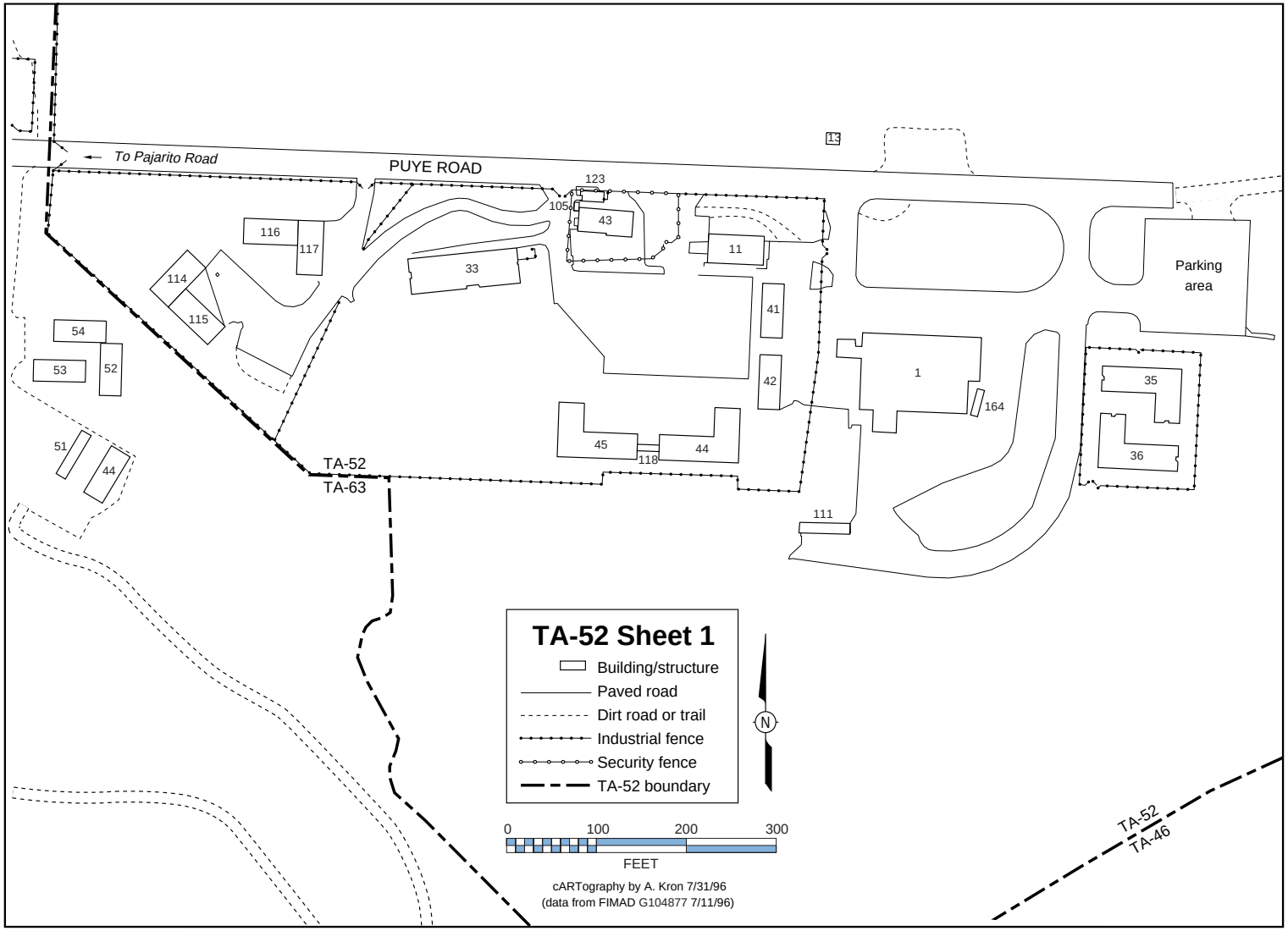


Figure 4-29. Map of TA-52, Reactor Development Site—Sheet 1.

4.30 TA-53, Los Alamos Neutron Science Center

4.30.1 Site Description

TA-53 [Table 4-26 and Figure 4-30 (index map of TA-53)] was originally developed as the Clinton P. Anderson Meson Physics Facility (also called the Los Alamos Meson Physics Facility). Recently, the facility was renamed the Los Alamos Neutron Science Center (LANSCE) to reflect the programs currently carried out at TA-53.

The Los Alamos Meson Physics Facility was first proposed in 1962 for research into subatomic particles and physics. Congress funded the concept three years later, and construction was completed in 1970. Today, the facility is one of the largest research accelerators in the world; the accelerator itself generates a proton beam more intense than that combined from all comparable accelerators in the world. Researchers from 300 institutions from the United States and more than 30 other countries provide input to the goals and policies governing the facility.

LANSCE currently supports both basic and applied research programs. Basic research has included studies of subatomic and particle physics, atomic physics, neutrinos, and the chemistry of subatomic interactions. Applied research programs include the production of radioisotopes for medical research and use, materials science studies that use neutron spallation, and contributions to defense programs such as stockpile stewardship and the production of tritium. LANSCE also supports programs for accelerator-related technologies such as radiofrequency power sources, high-power microwaves, and free-electron lasers.

TA-53 (Figure 4-30, Sheet 1) occupies a 750-acre (304-ha) mesa top, which has approximately 400 buildings and other structures and houses about 800 personnel. This population can increase by several hundred when the linear accelerator is in operation as visiting scientists from around the globe come to Los Alamos to monitor and participate in experiments.

Site workers are protected by shielding, fencing, access controls and sweep procedures, beam shutoff mechanisms, monitoring devices and dosimetry, posted safety information, training, administrative controls, and emergency response mechanisms. Restricted site access, site isolation, and on- and offsite monitoring provide additional protection for the public. Shielding, containment, isolation, and safe storage procedures for hazardous or activated materials—together with drainage and waste treatment systems, stack filtering, and emergency response and cleanup procedures—provide protection for the environment.

4.30.2 Facilities Description

LANSCE programs and activities are housed in three kinds of buildings. The first is the linear accelerator building itself (Building 3, Figure 4-30, Sheets 2 and 3). The second houses experimental areas and laboratories. The high-energy proton beam is transported from the accelerator building to six of the experimental areas; several experimental areas exist. These buildings house the large, complex, state-of-the-art instrumentation and equipment needed for the basic and applied research conducted at TA-53. The third houses the experimental support operations and advanced technology programs.

4.30.2.1 Facility Hazard Categories

Table 4-26 identifies the facilities at TA-53 that fall into a facility hazard category because of the type of operations performed in the facility.

4.30.2.1.1 Nuclear Facility Hazard Categories

TA-53 contains one Hazard Category 3 nuclear facility located in Building 3M in Experimental Area A, which currently houses the Isotope Production Facility. The facility is not nuclear at the time the nonirradiated targets, whose radioactive inventory is zero, are initially inserted in the beam line. It is not until irradiation begins and activation products in the isotope production targets reach Category 3 levels that the area is considered to be nuclear.

Isotope production refers to the ongoing process in which valuable radioisotopes, including those for medical use, are produced by the linear accelerator. Materials irradiation is a similar process conducted to ascertain the effects of beam irradiation on material properties. Because inventories of radioactive materials in the isotope production facility develop as a result of irradiation and cannot be measured beforehand, an inventory limit is calculated to ensure that the hazard category does not rise to levels beyond that projected.

4.30.2.1.2 Non-Nuclear Facility Hazard Categories

Twenty-two L/RAD facilities and 5 L/ENS facilities are located at TA-53. Only the more significant facilities are discussed below; the rest of the facilities are identified in Table 4-26 and on the accompanying figures.

4.30.2.1.2.1 Buildings Categorized L/RAD

4.30.2.1.2.1.1 Laboratory and Office Building

The Laboratory and Office Building (Building 1, Figure 4-30, Sheet 2) houses both offices and laboratories. The laboratories have been used for radiochemistry activities and therefore are categorized as L/RAD. The offices are normally separated from the laboratories.

4.30.2.1.2.1.2 Linear Accelerator

The Linear Accelerator (Building 3, Sectors A, B, C, D, E, F, G, H, J, N, P, R, and S) (Figure 4-30, Sheets 2 and 3) is more than a half-mile in length and has 316,000 ft^2 (96,317 m^2) of floor space, which is about one-third of the total area under roof at TA-53. The building contains equipment to form H^+ and H^- proton ion beams and to accelerate the beams to 84% of the speed of light. Ancillary equipment is used to transport the proton ion beam; maintain vacuum conditions in the beam transport system; and provide heating, ventilation, and cooling. The beam tunnel itself is located 35 ft (10.7 m) below grade to provide radiation protection. Abovesurface structures house the radiofrequency power sources used to accelerate the beam.

Experimental Area A is the largest [~32,000 ft^2 (~9,754 m^2)] of the experimental areas at TA-53. This area has housed numerous meson experiment stations in the past. By 1998, all experimental stations will be dismantled and removed, to be replaced by a major new experimental facility, the Long-Pulse Spallation Source (LPSS). LPSS will include the use of ultracold neutrons as a research tool, an area of research that is just beginning to emerge. LPSS will be designed to have 14 beam lines for neutron-scattering research and another for high-energy neutron research.

Sector N (Experimental Area B) currently houses several experimental stations that are no longer funded. Facilities for the production of exotic medical isotopes may be located here within the next five years. Sector P (Experimental Area C) currently holds the High-Resolution Spectrometer, which will be dismantled and removed by 1998. A Proton Radiography Firing Site will be constructed in its stead as part of the Laboratory's Science-Based Stockpile Stewardship Program.

4.30.2.1.2.1.3 Weapons Neutron Research Facility

The ion beam from the linear accelerator can be delivered directly to the Weapons Neutron Research (WNR) Facility (Buildings 7, 29, 369, and 541; Figure 4-30, Sheet 3), both to irradiate protons and to produce neutrons for investigating nuclear structures and reactions, as needed. The facility can also produce secondary beams containing pulsed neutrons, which allows precise measurement of neutron energy in various physics and materials science experiments. Targets 2 and 4 are housed at WNR.

4.30.2.1.2.1.4 Proton Storage Ring Laboratory

The proton linear accelerator sends 75 of its 1,000 μA of beam current to this 295-ft- (90-m-) diameter storage ring (Building 8, Figure 4-30, Sheet 3). The ring compresses the time structure of the proton beam from several hundred microseconds to 270 ns, which is then directed to downstream experimental stations.

4.30.2.1.2.1.5 Detector Development Laboratory

The Detector Development Laboratory, also called the High-Resolution-Beam Facility (Building 10, Figure 4-30, Sheet 3), houses equipment and stations for advancing the art of detecting particles created by spallation experiments.

4.30.2.1.2.1.6 Radiofrequency and High-Power Microwave Laboratories

The Radiofrequency and High-Power Microwave laboratories [Accelerator Technology Laboratory (Building 14), Proton Storage Ring Facility (Building 17), and the Building 18 warehouse; Figure 4-30, Sheet 3] house equipment and instrumentation used for the research, development, and testing of advanced concepts for radiofrequency power sources, high-power microwaves, and advanced accelerator and injection systems.

4.30.2.1.2.1.7 Neutrino Experiment Facility

Currently a liquid scintillator neutrino detector is housed in the Neutrino Experiment Facility, also called Neutron Experiment Service Building (Building 364, Figure 4-30, Sheet 3). The scintillator neutrino detector is scheduled to be removed after 1997 and will be replaced with one or more LPSS experimental stations.

4.30.2.1.2.2 Building Categorized L/ENS

The Low-Level Energy Demonstration Accelerator (LEDA) Project is housed in Building 365 (Figure 4-30, Sheets 2 and 3). This building originally housed projects started under the Reagan Administration as part of the Star Wars initiative. Initial work in the building focused on the Accelerator Test Stand Upgrade Project, which evolved into the Ground Test Accelerator Project. It now is slated to be home to LEDA, a 40-MW, low-energy accelerator currently under construction. LEDA will be the proving ground and demonstration center for the concept of tritium production in which a continuous-wave proton accelerator is used (instead of a nuclear reactor as in the past).

4.30.2.2 Nonhazardous Facilities

In addition to the facilities described above are approximately 375 administrative, technical, physical support, and other buildings and structures categorized as nonhazardous.

TABLE 4-26

FACILITIES THAT FALL INTO NUCLEAR AND NON-NUCLEAR HAZARD CATEGORIES
TA-53, LOS ALAMOS NEUTRON SCIENCE CENTER

Facility Number	Building Name	Operations Category	Nuclear Facilities Hazard Categories		Non-Nuclear Facility Hazard Categories					
			Cat. 2	Cat. 3	M/RAD	M/CHEM	L/RAD	L/ENS	L/CHEM	L/ENV
1	Laboratory & Office	Experimental Science					X			
3[a]	Linear Accelerator Building									
3A	Sector A	Experimental Science					X			
3B	Sector B	Experimental Science					X			
3C	Sector C	Experimental Science					X			
3D	Sector D	Experimental Science					X			
3E	Sector E	Experimental Science					X			
3F	Sector F	Experimental Science					X			
3G	Sector G	Experimental Science					X			
3H	Sector H	Experimental Science					X			
3J	Sector J	Experimental Science					X			
3M	Sector M	Experimental Science		X						
3N	Sector N	Experimental Science					X			
3P	Sector P	Experimental Science					X			
3R	Sector R	Experimental Science					X			
3S	Sector S	Experimental Science					X			
7	Weapons Neutron Research Building	Experimental Science					X			
8	Proton Storage Ring Lab	Experimental Science					X			
10	High-Resolution-Beam Facility	Experimental Science					X			

TABLE 4-26 (Continued)

FACILITIES THAT FALL INTO NUCLEAR AND NON-NUCLEAR HAZARD CATEGORIES
TA-53, LOS ALAMOS NEUTRON SCIENCE CENTER

Facility Number	Building Name	Operations Category	Nuclear Facilities Hazard Categories		Non-Nuclear Facility Hazard Categories					
			Cat. 2	Cat. 3	M/RAD	M/CHEM	L/RAD	L/ENS	L/CHEM	L/ENV
14	Accelerator Technology Lab	Experimental Science					X			
17	Proton Storage Ring Facility	Experimental Science					X			
18	Warehouse	Experimental Science					X			
19	Accelerator Technology Lab	Experimental Science						X		
29	40-Meter Experiment Station	Experimental Science					X			
30	Neutron Scattering Hall	Experimental Science					X			
34	Service Building (Detector Building)	Experimental Science					X			
315	Monitored Retrievable Storage Counting House	Experimental Science					X			
364	Neutron Experiment Service Building	Experimental Science					X			
365	Accelerated Test Stand Upgrade Facility	Experimental Science						X		
369	Weapons Neutron Research Building Target Cell 4	Experimental Science					X			
370	Detector Shed	Experimental Science					X			
371	Detector Shed	Experimental Science					X			
372	Storage Shed	Experimental Science					X			
374	Metal Shed	Experimental Science					X			

TABLE 4-26 (Concluded)

FACILITIES THAT FALL INTO NUCLEAR AND NON-NUCLEAR HAZARD CATEGORIES
TA-53, LOS ALAMOS NEUTRON SCIENCE CENTER

Facility Number	Building Name	Operations Category	Nuclear Facilities Hazard Categories		Non-Nuclear Facility Hazard Categories					
			Cat. 2	Cat. 3	M/RAD	M/CHEM	L/RAD	L/ENS	L/CHEM	L/ENV
382	Detector Shed	Experimental Science					X			
541	Experiment Station	Experimental Science					X			
616	Detector Shed	Experimental Science					X			
633	Trailer (Lab)	Experimental Science						X		
757	Cryogenic Building	Experimental Science								
761[b]	Semitrailer	Physical Support						X		
823	Weapons Neutron Research Building Building 7	Experimental Science					X			
1031	Storage Shed	Physical Support						X		

a. The Linear Accelerator Building is broken up in sectors, which are listed individually.
b. This semitrailer does not appear on the map.

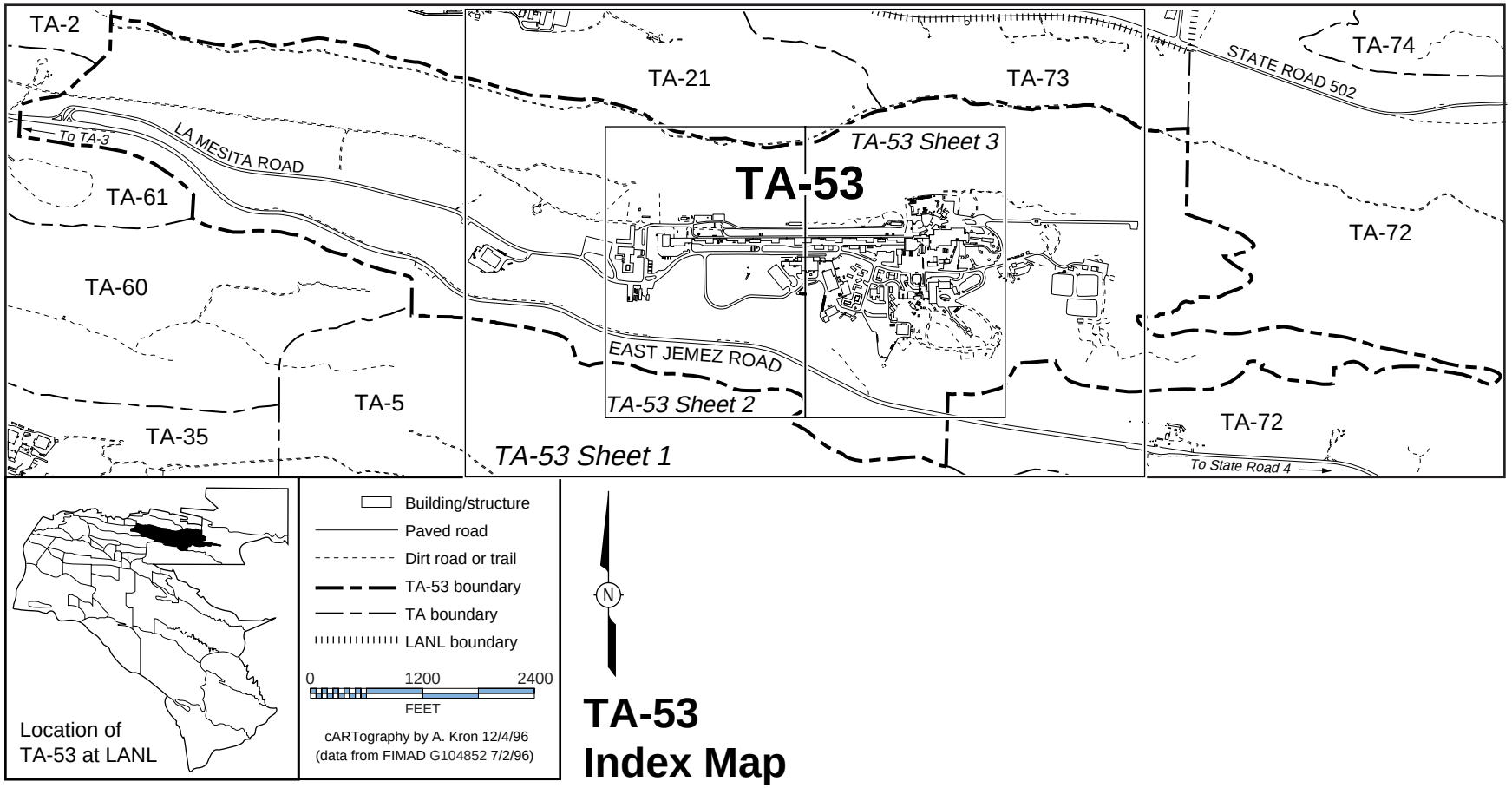


Figure 4-30. Map of TA-53, Los Alamos Neutron Science Center—Index Map.

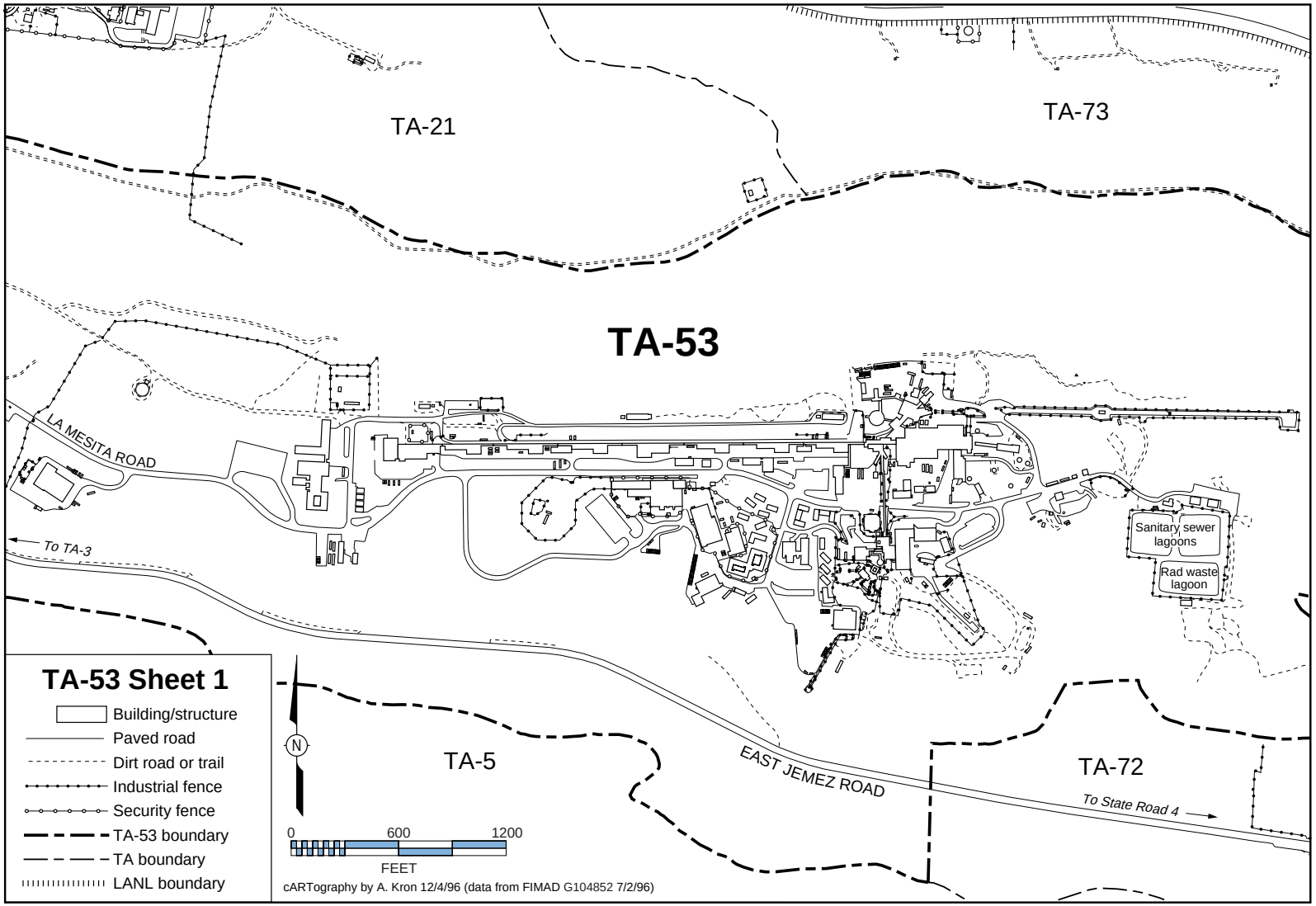


Figure 4-30. Map of TA-53, Los Alamos Neutron Science Center—Sheet 1.

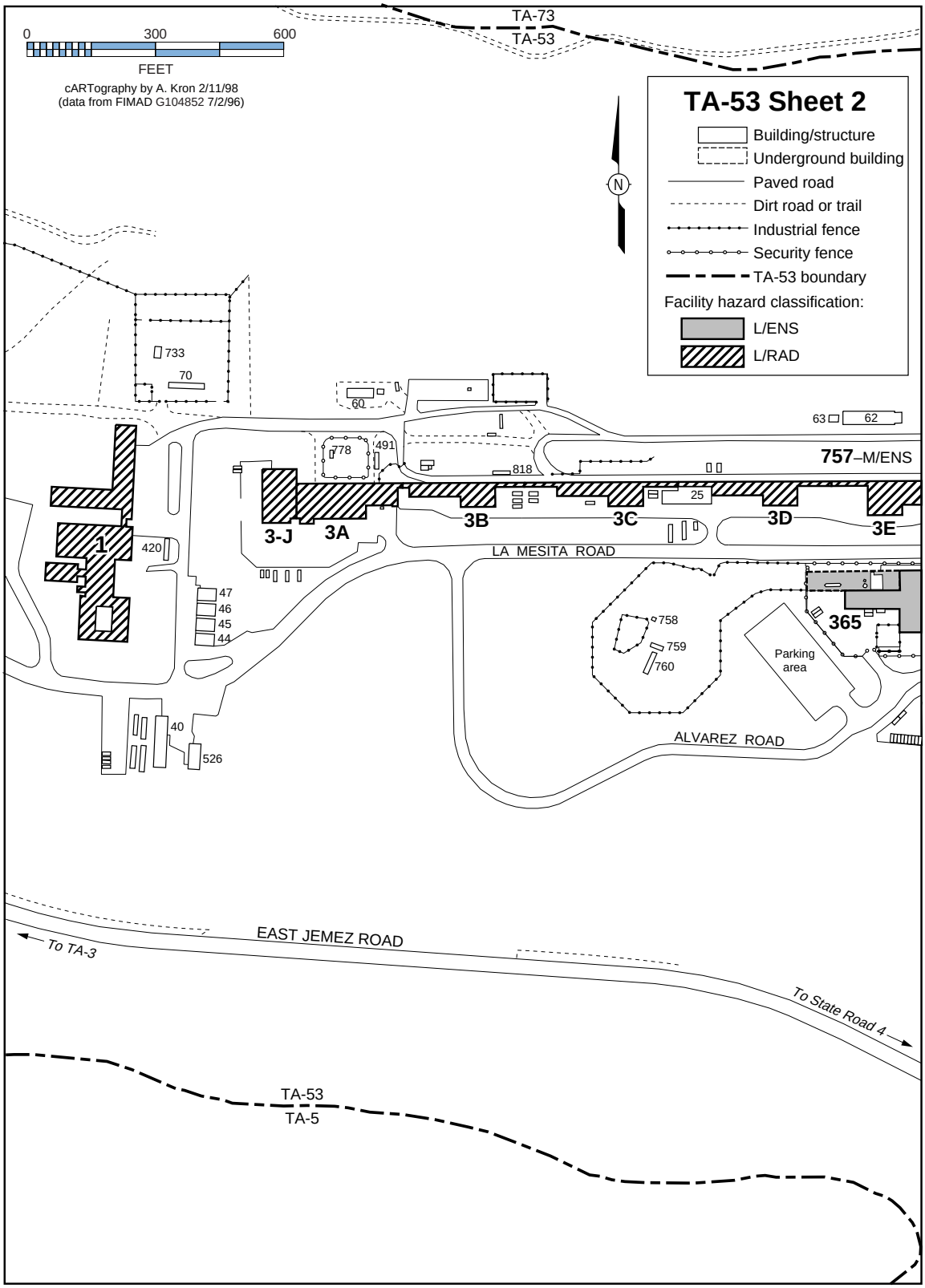


Figure 4-30. Map of TA-53, Los Alamos Neutron Science Center—Sheet 2.

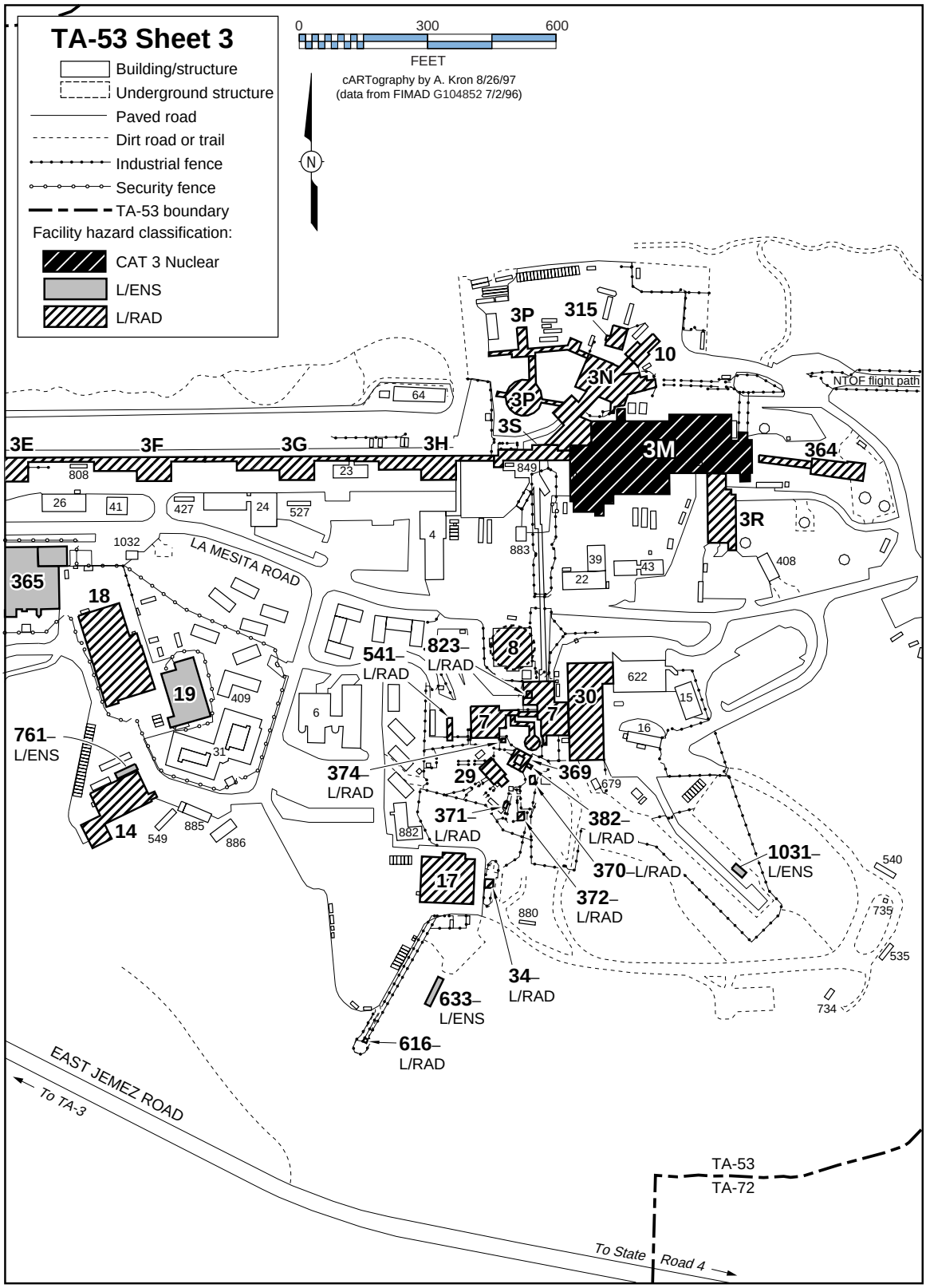


Figure 4-30. Map of TA-53, Los Alamos Neutron Science Center—Sheet 3.

4.31 TA-54, Waste Disposal Site

4.31.1 Site Description

TA-54 [Table 4-27 and Figure 4-31 (index map of TA-54)] is one of the largest [943 acres (382 ha)] and most environmentally significant TAs at Los Alamos. Its primary function is management of radioactive solid and hazardous chemical wastes. The site's 3-mi (4.8-km) northern border forms the boundary between the Laboratory and San Idlefonso Pueblo, and its southeastern boundary borders the part of Los Alamos County known as White Rock. Nearly 70 archaeological sites have been found in the TA. Its disposal operations have a permanent environmental effect.

Many of the operations at the Laboratory generate liquid, solid, and gaseous wastes that contain radioactive materials, nonradioactive but potentially hazardous materials, or a combination of the two. All of these types of wastes are characterized, stored, and/or disposed at TA-54. Waste handled at the site is characterized as LLW, low-level mixed waste, TRU waste, hazardous waste, PCB waste, and nonregulated chemical wastes.

TA-54 has 120 structures, of which 101 house waste management personnel and operations. Approximately 130 workers are needed to perform these treatment, storage, and disposal operations.

4.31.2 Facilities Description

TA-54's facilities are grouped in various areas according to the type of waste managed. Area G is the LLW management area. Area H, a site at which radioactive wastes were disposed up until 1986, is designated for cleanup under the Resource Conservation and Recovery Act. Area J is an administratively controlled waste management area set aside for solid and nonhazardous wastes that must be managed separately for security reasons. Area L is the chemical waste management area.

4.31.2.1 Facility Hazard Categories

Table 4-27 identifies the facilities at TA-54 that fall into a facility hazard category because of the type of operations performed in the facility. The following discussion of facility hazard categories focuses on the various areas rather than on individual buildings. Unless noted otherwise, all the buildings involved in handling waste in a given area bear the same hazard category as that of the area.

4.31.2.1.1 Nuclear Facility Hazard Categories

All of Area G is categorized as a Hazard Category 2 nuclear facility. However, on the accompanying facility maps, only significant buildings in this category are shaded. In addition, Building 38, the Radioassay and Nondestructive Testing Facility, in Area G West is categorized as a Hazard Category 2 nuclear facility.

4.31.2.1.1.1 Area G

Area G (Figure 4-31, Sheet 3) is a 63-acre (25.5-ha) site located at the east end of TA-54. The area provides intermediate and long-term storage sites for wastes generated at the Laboratory. Major Area G waste management units include numerous LLW disposal pits and waste storage and disposal shafts, most of which have been closed; TRU waste pads and storage domes, which may include low-level mixed waste, if needed; a facility for decontaminating radioactive waste containers and contaminated equipment; two compactor facilities for LLW; and an administrative sup-

port building that contains a locker room and a decontamination shower. The area has been in use since 1957 and is expected to remain active for the foreseeable future.

In 1977, the active portion of Area G was expanded to its current 63 acres (25.5 ha). Before 1985, low-level mixed waste was disposed in pits at this site. The surface structures are predominantly membrane-covered domes supported by arch frames, which are used for waste storage. Subsurface structures include waste disposal pits excavated in volcanic rock and auger-bored shafts for storing and disposing of radioactive wastes in various forms. Entry is permitted through a monitored gate at the west end of Area G.

Processes at Area G include waste receipt, handling, storage, compaction, and disposal. These low-complexity operations involve trucks, forklifts, and heavy equipment to safely convey, manipulate, handle, and/or dispose of containers of waste. Other routine operations include decontaminating vehicles, equipment, and metal waste containers, as necessary; sanding and painting drums; overpacking damaged or potentially degraded waste containers; auditing and inspecting waste disposal and storage operations; constructing or closing pits and shafts; and conducting general facility maintenance activities.

- Disposal Pits and Shafts. At present, subsurface disposal units include 35 pits, approximately 260 shafts, and 4 trenches. Guidelines for constructing disposal units at Los Alamos were developed in conjunction with the US Geological Survey. Pits typically cover 24,608 ft^2 (7,500 m^2) and are approximately 65.6 ft (20 m) deep. Shafts range from 0.98–8.3 ft (0.3–2.5 m) in diameter and are up to 65.6 ft (20 m) in depth. Pits are excavated in at least 50 ft (15 m) from the edge of the mesa, and their bottoms are at least 9.84 ft (3 m) above the floor of adjacent canyons.

- Buried Wastes. Area G consists of 80 acres (32 ha), of which 37 acres (15 ha) has been developed and is the currently active radioactive waste management area. This 37-acre (15-ha) area holds legacy waste, including TRU waste disposed before 1971 and mixed LLW disposed before the passage of the Resource Conservation and Recovery Act in 1976, as well as LLW buried since 1958. Five pits (15, 31, 37, 38, 39) in the 37-acre (15-ha) area are active, all of which are used for disposal of LLW. As of January 30, 1997, the 5 pits had a remaining disposal capacity of about 85,306 ft^3 (26,000 m^3). Enough space remains in this area to provide pit capacity for about another 32,810 ft^3 (10,000 m^3) of wastes. After this capacity has been used, continued disposal of LLW at TA-54 would require expansion of disposal operations beyond the current 37 acres (15 ha).

- Temporary Retrieval Dome (Building 226, Figure 4-31, Sheet 3). This large [approximately 21,000 ft^2 (6,400 m^2)], fabric-covered structure is the site of the TRU Waste Inspectable Storage Project (TWISP), which involves inspecting the approximately 17,000 drums of TRU waste that have been stored and covered with earth at TA-54 awaiting shipping to the DOE's Waste Isolation Pilot Plant (WIPP). The dome provides an enclosure and weather protection for workers during the time required to retrieve the containers and inspect them.

- Drum Preparation Facility (Building 33, Figure 4-31, Sheet 3). This building houses activities that are part of the Drum Recovery Project. The facility provides (1) bays for steam cleaning and painting drums of TRU waste retrieved during the TWISP, (2) water sedimentation pits and collection tanks, (3) a drum-venting system that will safely puncture and vent retrieved drums of TRU waste, and (4) a general-treatment bay that will be used for reducing the volume of gloveboxes and similar large waste items and for segregating the different waste types.

- Compactor Facility (Building 281, Figure 4-31, Sheet 3). This building houses a waste compactor that has 200 tons (181,440 kg) of compressive force, which can reduce volume as

much as eight times. Compacting waste helps to conserve disposal space and minimizes soil subsidence at the disposal pit. A smaller compactor is used to crush items such as empty drums.

- Tension Support Buildings (Buildings 49 and 224, Figure 4-31, Sheet 3). These domes are used for storing mixed LLW. An asphalt pad adjacent to Building 49 is used for outdoor storage of pyrophoric uranium waste chips.

- Sheds (Buildings 144, 145, 146, and 177). The sheds (which are too small to show up on the maps) are used for storing mixed tritiated wastes.

- Tension Support Buildings: Buildings 48, 153, and 283 (Figure 4-31, Sheet 3). These domes are used for newly generated TRU waste.

- Tension Support Buildings (Buildings 229, 230, 231, and 232, Figure 4-31, Sheet 3). These domes [16,000 ft^2 (4,877 m^2) each] are used for legacy TRU waste retrieved during the TWISP.

- Storage Pads 2, 3, and 4 (Figure 4-31, Sheet 3). These asphalt pads hold legacy TRU waste in drums and other containers. During the 1970s and 1980s, the pads and containers were covered with earth. Wastes are currently (1997) being retrieved and placed in abovesurface storage domes to permit inspections required by the Resource Conservation and Recovery Act and to ensure that wastes and containers are in a form suitable for disposal.

4.31.2.1.1.2 Area G West

Area G West (also called TA-54 West) is the site of the Radioassay and Nondestructive Testing (RANT) Facility (Building 38, Figure 4-31, Sheet 1). The functions of the RANT Facility (formerly known as the Nondestructive Assay/Nondestructive Examination Facility) are to determine the characteristics of packaged waste, which involves detecting liquids, void spaces, and fissionable materials. RANT will also serve as the loading station for shipments of TRU waste when WIPP begins disposal operations.

All radioactive and mixed waste received at this site must meet waste acceptance criteria to ensure safety, environmental protection, and regulatory compliance. TRU waste must also be shown to meet the waste acceptance criteria applicable to WIPP. In lieu of opening and examining waste containers, nondestructive techniques are used to verify the contents of waste to prevent worker exposure and escape of contaminants to the environment.

Verification assay and radiographic examination of unopened containers of radioactive and mixed waste take place at RANT. The facility will also serve as a certification and staging facility for TRU waste to be transported to WIPP.

The major assay and examination equipment includes a 320-keV real-time radiography system, a passive/active neutron interrogation assay system, an airport-type x-ray system, a platform scale, and a gas proportional smear counter. Other equipment in the facility includes powerlift trucks, a dock leveler, and various types of rigging and materials-handling equipment. The airport x-ray, radiography, and neutron systems are each contained in separate shielded cabinets.

The RANT Facility, which is divided into two high-bay areas, is approximately 6,400 ft^2 (1,951 m^2). One of the bays has a mezzanine that houses offices and rest rooms. The waste drums are received at the loading dock attached to this bay. The other bay area, originally built for loading TRU

waste into TRUPACT-II containers, can be used to store and assay waste in the future and will be used as a staging area for mobile assay equipment. The exterior load-bearing walls are precast concrete panels. The floor is a reinforced-concrete slab on compacted fill. The roof of the facility is a single-ply membrane roof with ballast over prestressed-concrete double T-beams. Utilities include electrical power and water for domestic, industrial, and fire-fighting purposes. Emergency support services are accessible by radio and telephone.

All radioactive and mixed wastes are contained. TRU solid wastes and mixed wastes are contained in metal drums. Compactable LLW may be packaged in cardboard boxes. Containers with excessive removable surface contamination and leaking containers are not permitted inside this facility.

4.31.2.1.2 Non-Nuclear Facility Hazard Categories

4.31.2.1.2.1 Building Categorized M/CHEM

Building 1008 (Figure 4-31, Sheet 1), a drinking water chlorination station, is categorized as M/CHEM.

4.31.2.1.2.2 Areas Categorized L/CHEM

Area L (Figure 4-31, Sheet 2), an area of 2.65 acres (1.07 ha), provides storage and shipment of wastes managed under permits required by the Toxic Substances Control Act and the Resource Conservation and Recovery Act. It also stores liquid waste and waste containing volatile organic compounds, both of which are also contaminated with hazardous and/or radioactive components. A portion of Area L is used for storing nonradioactive, PCB-contaminated waste oils and empty transformers. In addition to permitted storage, Area L houses treatment tanks for barium-contaminated sand and ammonium bifluoride. The waste stored and/or treated at Area L is ultimately shipped to other locations, both on- and offsite, for disposal, treatment, or recycling.

Chemical wastes were disposed at Area L from the 1950s until December 1986. Inactive disposal units include 1 pit, 3 surface impoundments, and 34 shafts, with a total disposal capacity of 6,575 ft^3 (2,004 m^3). Noncontainerized solids and liquids drummed without absorbent were disposed in unlined pit and shafts. Unlined surface impoundments were used to evaporate treated salt solutions such as ammonium biofluoride and electroplating waste solutions. An unlined impoundment was also used to react lithium hydride with water and to serve as secondary containment for waste oil tanks. These former operations are being investigated as part of Operable Unit 1148 in the Environmental Restoration Program at the Laboratory.

Important structures at Area L are discussed below.

4.31.2.1.2.2.1 Liquid-Low-Level-Mixed-Waste-Storage Building

The Liquid-Low-Level Mixed Waste Storage Building (Building 215) is a large [16,000-ft^2 (4,877-m^2)] new structure used for storing drums of liquid low-level mixed wastes. The building has a bermed asphalt floor, an unfiltered exhaust stack, interior lighting, and an overhead fire suppression system.

4.31.2.1.2.2.2 Gas Cylinder Canopy

The Gas Cylinder Canopy (Building 216) is a roofed facility of 4,000 ft^2 (1,220 m^2) with a single wall used to store gas cylinders until they can be shipped offsite for treatment and disposal.

4.31.2.1.2.2.3 PCB Building

Liquid and solid PCB wastes are stored at the PCB Building (Building 39) until they are shipped for treatment and disposal. Some of the liquid wastes are also contaminated with hazardous and/or radioactive wastes.

4.31.2.1.2.2.4 Liquid Chemical Storage Canopy

The Liquid Chemical Storage Canopy (Building 32) is an open structure in which drums of liquid chemical wastes are stored. The drums are segregated for chemical compatibility and stored in the appropriate section.

4.31.2.1.2.2.5 Lab Pack Storage Units

Small quantities of hazardous wastes are placed in 5-gal. (19-L) lab packs, which are placed in small storage units (Buildings 68, 69, and 70). Lab packs are segregated for chemical compatibility and stored in these small sheds until they are shipped for treatment and disposal. The storage units are equipped with secondary containment.

4.31.2.1.2.2.6 Sampling, Shipment, and Treatment Canopies

The sampling, shipment, and treatment canopies (Buildings 35, 36, and 58) are sheltered pads that have overhead covering but no sides. Building 35 contains two treatment tanks that are not currently in use. Canopy 36 holds equipment used to survey and sort mixed wastes.

4.31.2.1.3 Building Categorized L/RAD

Samples of mixed waste from environmental restoration and waste management operations are analyzed for organic hazardous constituents at the Mixed-Waste Analysis Laboratory (Building 1009, Figure 4-31, Sheet 1). The samples consist of extractions of small amounts of water, soil, and sludge.

4.31.2.2 Nonhazardous Facilities

4.31.2.2.1 Area H

Radioactive wastes were disposed in nine shafts at Area H [Figure 4-31 (index map of TA-54)] until 1986, when disposal was discontinued. The Environmental Restoration Program is now investigating this small, 0.3-acre (0.12-ha) site as a solid waste management unit under the Resource Conservation and Recovery Act. There are no aboveground structures at Area H.

4.31.2.2.2 Area J

Area J (Figure 4-31, index map of TA-54) is 2.65 acres (1.07 ha) and has been used since 1961 for disposal of industrial solid wastes. The area has six disposal pits and four disposal shafts. Pits 1 and 2 are filled and capped with soil. Pit 3 is filled and capped with asphalt, and an asbestos transfer station is located on the asphalt. Pit 4, the largest, is 70% filled. Pits 5 and 6 are less than 10% filled. Two of the four shafts are filled and capped with concrete. Shafts 3 and 4 are less than 10% filled. The shafts are 6 ft (1.8 m) in diameter and 60 ft (18.3 m) deep. The size of the pits varies.

Five kinds of waste management operations are conducted at Area J:

- Administratively controlled industrial solid wastes are disposed. Three pits are open, three had been filled as of January 1997. The State of New Mexico permits disposal at Area J under an interim permit.

- Previously hazardous wastes are disposed at Area J. In the past, barium-contaminated soils were neutralized at TA-54, Area L, then disposed at Area J in the same pits used for industrial wastes. The last such disposal occurred in 1993.

- Classified industrial wastes are disposed in shafts. There are four shafts, each 60 ft (18.3 m) deep and 5 ft (1.5 m) in diameter. Two of the shafts are filled, and two are nearly empty.

- An asbestos transfer station is operated pursuant to New Mexico Environment Department (NMED) regulations. Two roll-off containers are used to store friable asbestos wastes, and nonfriable asbestos wastes are stored on an asphalt pad. All asbestos wastes are shipped offsite to permitted asbestos disposal facilities.

- Oil-contaminated soils are land-farmed under interim permit from NMED. Soil is turned periodically, and soils are sampled for hydrocarbon content. The land farm covers an area of 8,200 ft^2 (2,500 m^2). Oil-contaminated soils have not been added to the land farm area since 1992.

4.31.2.2.3 Other TA-54 Facilities

A number of buildings at TA-54, which consist mainly of offices, general storage, passageways, and pump stations, are not considered to be hazardous. These buildings are located outside of the various hazardous areas.

TABLE 4-27

FACILITIES THAT FALL INTO NUCLEAR AND NON-NUCLEAR HAZARD CATEGORIES
TA-54, WASTE DISPOSAL SITE

Facility Number	Building Name	Operations Category	Nuclear Facilities Hazard Categories		Non-Nuclear Facility Hazard Categories					
			Cat. 2	Cat. 3	M/RAD	M/CHEM	L/RAD	L/ENS	L/CHEM	L/ENV
Area G Buildings	Low-Level Radioactive Waste Disposal Area and TRU Waste Storage Site	Waste Management	X							
2	Operations Building						X			
33	TRU Waste Drum Preparation Facility		X							
48	Tension Support Dome		X							
49	Tension Support Dome		X							
144	Shed		X							
145	Shed		X							
146	Shed		X							
153	Tension Support Dome		X							
177	Shed		X							
224	Tension Support Dome									
226	Temporary Retrieval Dome		X							
229	Tension Support Dome		X							
230	Tension Support Dome		X							
231	Tension Support Dome		X							
232	Tension Support Dome		X							

TABLE 4-27 (Continued)

FACILITIES THAT FALL INTO NUCLEAR AND NON-NUCLEAR HAZARD CATEGORIES
TA-54, WASTE DISPOSAL SITE

Facility Number	Building Name	Operations Category	Nuclear Facilities Hazard Categories		Non-Nuclear Facility Hazard Categories					
			Cat. 2	Cat. 3	M/RAD	M/CHEM	L/RAD	L/ENS	L/CHEM	L/ENV
281	Compactor Facility		X							
283	Tension Support Dome		X							
Pad 2	Storage Pad		X							
Pad 3	Storage Pad		X							
Pad 4	Storage Pad		X							
Area G West Build-ings		Waste Management								
38	Radioassay and Nondestructive Testing Facility		X							
Area L Build-ings	Hazardous Chemical Waste Management	Waste Management								
31	Morgan Shed	Waste Management							X	
32	Canopy and Pad								X	
35	Treatment Pad								X	
36	Sampling Pad								X	
39	PCB Waste Storage								X	
46	Morgan Shed								X	
50	Morgan Shed								X	
55	Morgan Shed								X	
58	Transportation Pad								X	
62	Canopy								X	
68	Transportainer								X	
69	Transportainer								X	

TABLE 4-27 (Concluded)

FACILITIES THAT FALL INTO NUCLEAR AND NON-NUCLEAR HAZARD CATEGORIES
TA-54, WASTE DISPOSAL SITE

Facility Number	Building Name	Operations Category	Nuclear Facilities Hazard Categories		Non-Nuclear Facility Hazard Categories					
			Cat. 2	Cat. 3	M/RAD	M/CHEM	L/RAD	L/ENS	L/CHEM	L/ENV
70	Transportainer								X	
82	Drum Crusher Shed								X	
174	Mixed-Waste Storage								X	
215	Tension Support Dome								X	
216	Tension Support Dome								X	
Other TA-54 Build-ings										
1008	Chlorination Station	Physical Support				X				
1009	Chemistry Lab	Waste Management					X			

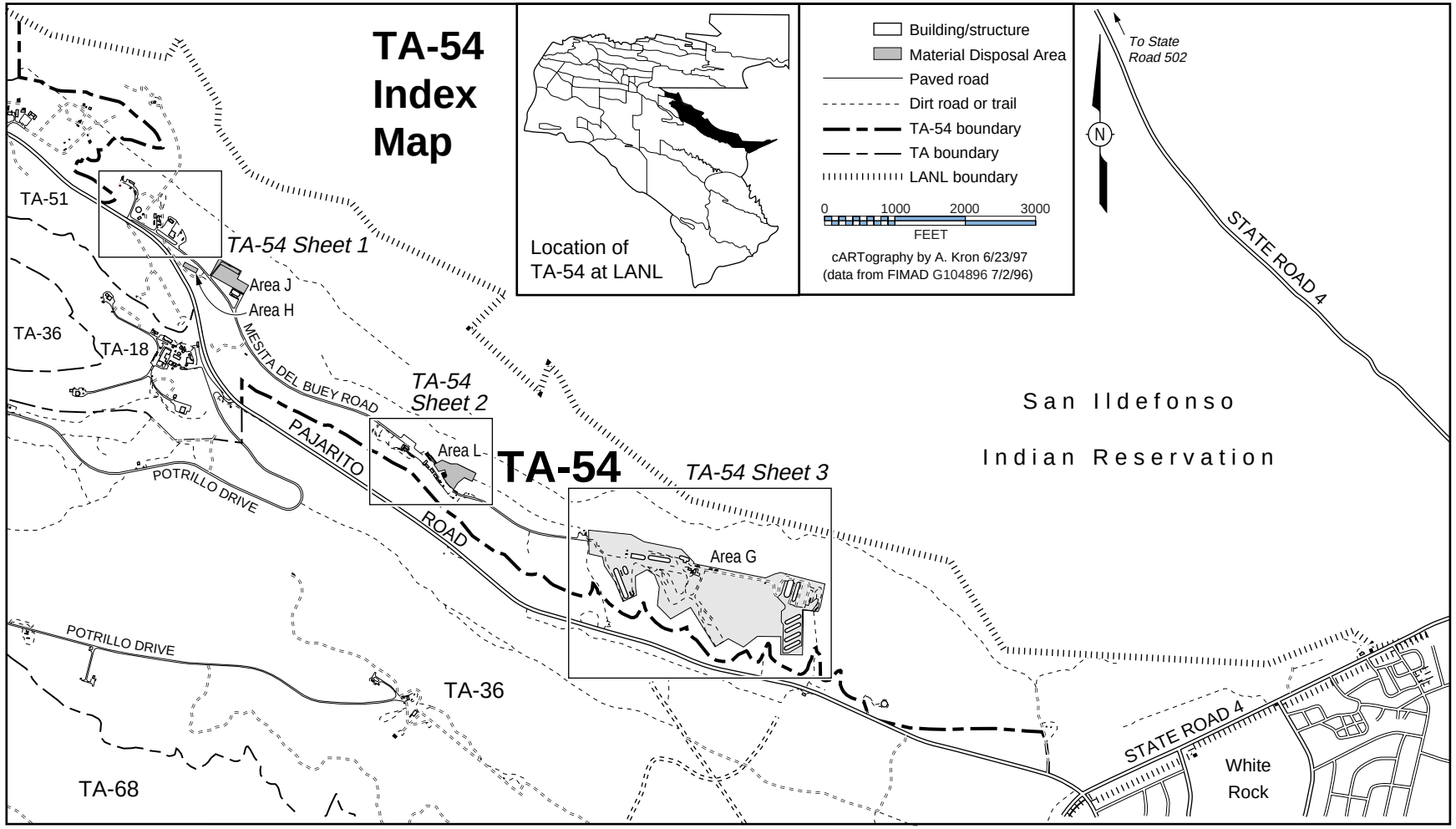


Figure 4-31. Map of TA-54, Waste Disposal Site—Index Map.

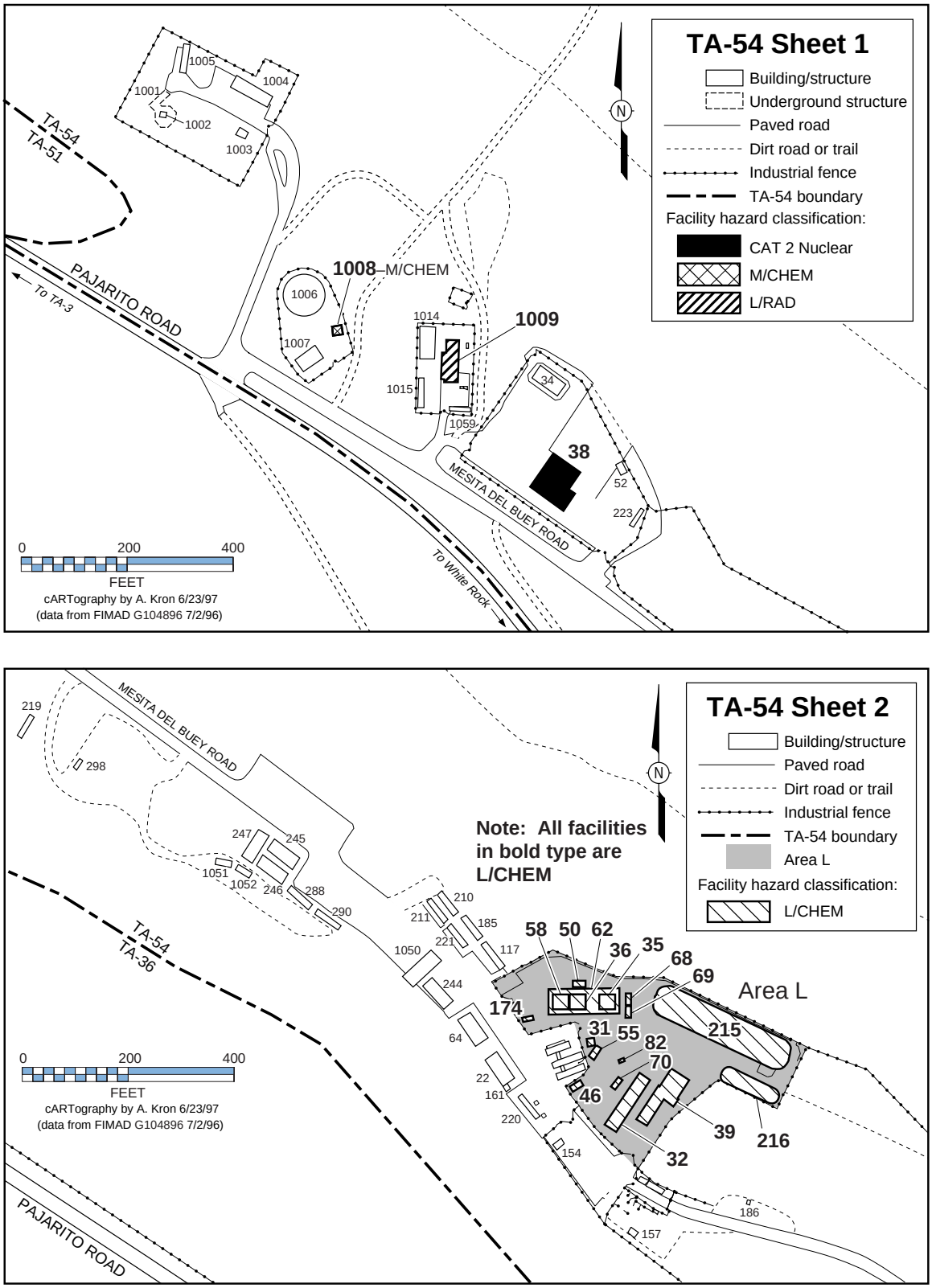


Figure 4-31. Map of TA-54, Waste Disposal Site—Sheets 1 and 2.

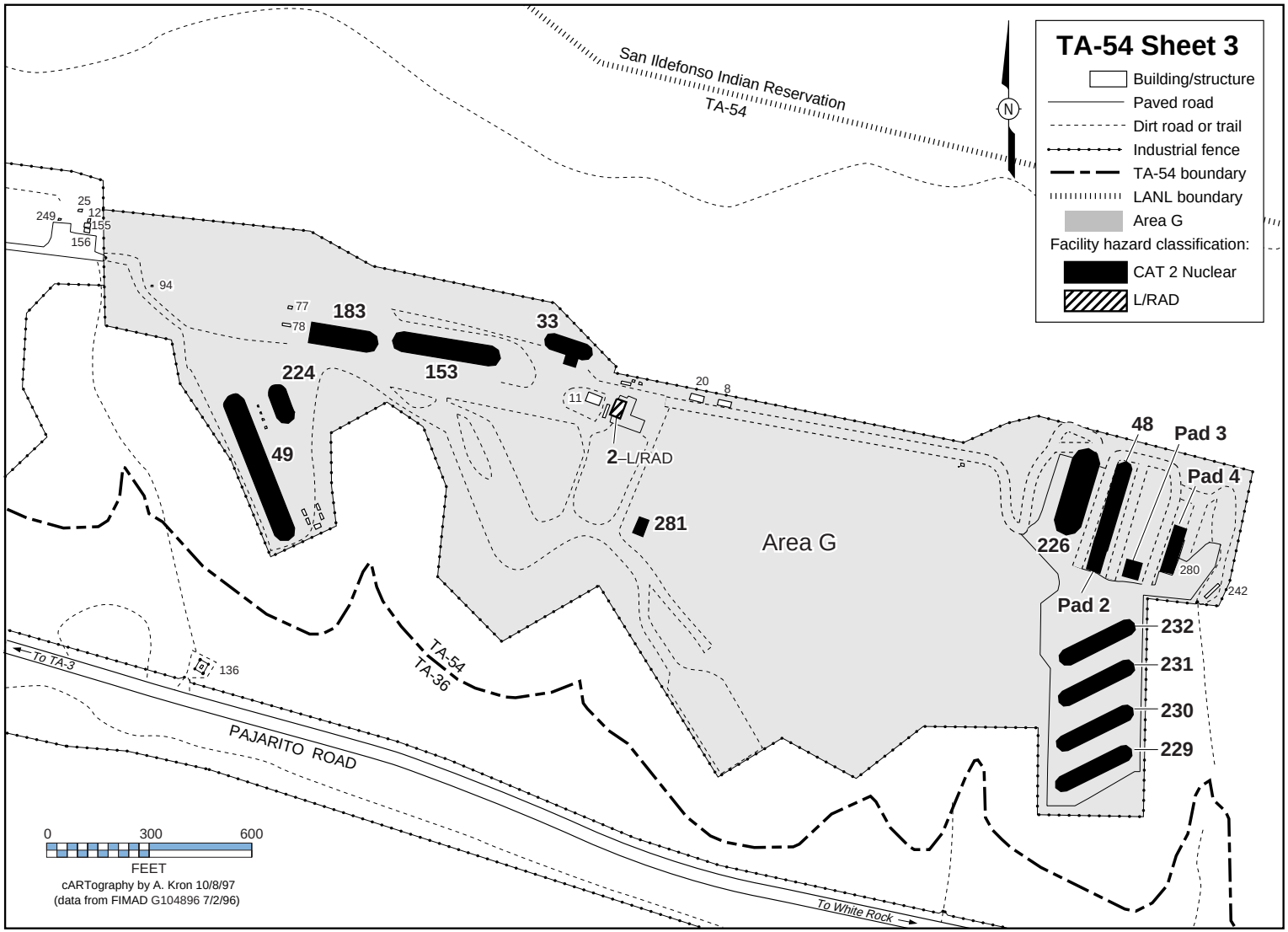


Figure 4-31. Map of TA-54, Waste Disposal Site—Sheet 3.

4.32 TA-55, Plutonium Facility Site

4.32.1 Site Description

The Plutonium Facility Site at TA-55 [Table 4-28, Figure 4-32 (index map of TA-55)] is located on 40 acres (16.18 ha) about 1 mi (1.6 km) southeast of the central technical area (TA-3). Most of TA-55 is situated inside a restricted area surrounded by a double security fence. The main complex has five connected buildings: the Administration Building (Building 1), the Support Office Building (Building 2), the Support Building (Building 3), the Plutonium Facility (Building 4), and the Warehouse (Building 5). The Nuclear Materials Storage Facility (Building 41) is separate from the main complex but shares an underground transfer tunnel with Building 4. Various support, storage, security, and training structures are located throughout the main complex.

4.32.2 Facilities Description

To meet the varied needs of research and development and plutonium-processing programs at the Laboratory, TA-55 provides chemical and metallurgical processes for recovering, purifying, and converting plutonium and other actinides into many compounds and forms. Additional capabilities include the means to safely and securely ship, receive, handle, and store nuclear materials, as well as manage the wastes and residues produced by TA-55 operations. A core capability is basic and applied research in plutonium and actinide chemistry.

Core competencies are maintained in the Plutonium Facility for each type of plutonium-processing activity. Extensive plutonium recovery processes are maintained, as well as the ability to convert the recovered material to plutonium metal. A separate portion of the facility is dedicated to fabricating ceramic-based reactor fuels and to processing ^{238}Pu used to produce radioisotope heat sources. In addition, analytical capabilities, materials control and accountability techniques, and a substantial R&D base are available to support these core capabilities.

A sophisticated nuclear materials measurement and accountability system is used at TA-55. The system includes nuclear materials accounting, nuclear materials management and modeling, a measurement support operation, operation of a nondestructive assay laboratory, nuclear materials packaging and transfer, and nuclear materials storage. All nuclear materials that are in process or are stored onsite are monitored to ensure that material balances are properly maintained and inventoried on a real-time basis. The nuclear-materials-packaging and transfer operation receives nuclear material into the facility and transfers shipments out of the facility. The nuclear materials storage operation provides a safe storage location for the actinide materials at the Plutonium Facility.

The Plutonium Facility has extensive capabilities for treating, packaging, storing, and transporting the radioactive waste produced by TA-55 operations. Liquid wastes are converted to solids or are piped to the RLWTF at TA-50. Some solid TRU wastes are immobilized in cement in 55-gal. (208-L) drums. Other TRU waste is consolidated in 15-gal. (57-L) or 30-gal. (114-L) drums or is packaged in waste boxes. Low-level wastes are also packaged at this facility. Solid wastes of all types are stored at TA-55 until they are shipped to Laboratory waste storage or disposal locations, primarily at TA-54.

4.32.2.1 Facility Hazard Categories

Table 4-28 identifies the facilities at TA-55 that fall into a facility hazard category because of the type of operations performed in the facility.

4.32.2.1.1 Nuclear Facility Hazard Categories

The Plutonium Building (Building 4) is categorized as a Hazard Category 2 nuclear facility. Although not currently operational, the Nuclear Materials Storage Facility will also be a Hazard Category 2 nuclear facility and is shown as such on the accompanying maps.

4.32.2.1.1.1 Plutonium Building

Plutonium processing is performed in the Plutonium Building (Building 4, Figure 4-32, Sheet 1), which is a two-story laboratory of approximately 151,000 ft^2 (46,025 m^2). The exterior walls and roof are of reinforced concrete. A concrete fire wall divides the building into two halves, each of which contains its own ventilation systems and electrical substations. One half of the process floor is divided by a central corridor into Areas 100 and 200. This half contains the plutonium research and development laboratories, the ^{238}Pu operations, and the personnel decontamination area. The other half is divided into Areas 300 and 400 by another corridor. This half houses plutonium recovery, metal preparation and fabrication, and nondestructive analysis laboratories. Each of the processing areas is further divided into a number of rooms that contain the gloveboxes for plutonium work. The ventilation systems that service the gloveboxes and all other utilities are located in the basement of the facility. The basement also houses critical support equipment, including all other ventilation equipment, the packing/unpacking room, waste-handling areas, the isopress laboratory, and the plutonium storage vault.

Three levels of containment are provided for plutonium processing. The primary confinement system includes gloveboxes, hoods, vessels, tanks, piping, and the glovebox ventilation exhaust system. The secondary confinement system includes the walls, floors, ceiling, and doors of the laboratories containing the gloveboxes, as well as the laboratory recirculation and bleed-off exhaust system. The exterior walls, floor, roof, and doors of the structure, along with the basement exhaust system, provide the tertiary confinement system.

The ventilation system in the facility has four zones, all of which are maintained at a lower pressure than that of the outside air. Air enters the two halves of the facility through an intake stack that has four ducts. Two ducts supply air to each half of the building. The ventilation system is designed so that each zone operates as a separate building with its own filtered exhaust stack. Exhaust from each confinement area is sent through at least two stages of HEPA filtration to prevent radioactive particles from being discharged to the environment.

The conveyor system in the facility transports contaminated material and equipment to almost any point on the first floor. Elevated stainless steel tunnels equipped with a trolley hoist system connect the gloveboxes. The vertical portions of the tunnels connect the overhead system to the gloveboxes at drop boxes located on the first floor. These drop boxes are the transfer points in which items are hoisted up to the trolley in the overhead tunnel system for eventual offsite waste disposal.

The criticality detection system monitors operations on the main processing floor of the Plutonium Facility and in the basement vault to detect gamma energy released from fission of SNM. The system is designed to detect conditions that could lead to a criticality accident in this facility and to sound an audible alarm. The alarm initiates immediate evacuation to minimize personnel exposure. This system consists of 20 Geiger-Mueller detector heads and associated circuitry located throughout the first-floor process areas and basement vault.

A continuous air-monitoring system is used to sample and analyze air from multiple points throughout the laboratory areas, basement, ductwork, and exhaust stacks. A continuous stream of sample air is drawn to a solid-state alpha detector, whose data are used for man/machine interface (lights, meter, squealer) and for monitoring by the operations center.

Other supporting systems include fire detection and suppression systems, a chilled-water system, an instrument air system, electrical power, water distribution systems, and a vacuum system. Voice communication is provided by a paging system and a telephone system. The emergency system provides paging throughout the TA-55 area and sounds the criticality and fire alarms.

4.32.2.1.1.2 Nuclear Materials Storage Facility

The Nuclear Materials Storage Facility (Building 41, Figure 4-32, Sheet 1) will eventually contain a significant amount of stored nuclear material. This facility is primarily intended for intermediate and long-term storage of SNM. Although completed in 1987, the Nuclear Materials Storage Facility has never operated because of design and construction deficiencies. A major renovation project is being planned to correct those deficiencies so that the facility can operate. The renovation project is expected to be completed by 2001.

4.32.2.1.2 Non-Nuclear Facility Hazard Categories

Two facilities, Buildings 3 and 5, are categorized L/CHEM, and one facility, Building 7, is L/ENS. Building 3 (the Support Building) contains some laboratories that use chemicals. Building 5 (the Warehouse) is used to store chemicals. Building 7 (the Calcium Building) is used to store calcium (Figure 4-32, Sheet 1).

4.32.2.2 Nonhazardous Facilities

Approximately 55 other facilities exist at TA-55, all of which have been categorized nonhazardous. These buildings are administrative, technical, and general storage buildings; passageways; and pump stations.

TABLE 4-28

FACILITIES THAT FALL INTO NUCLEAR AND NON-NUCLEAR HAZARD CATEGORIES
TA-55, PLUTONIUM FACILITY SITE

Facility Number	Building Name	Operations Category	Nuclear Facilities Hazard Categories		Non-Nuclear Facility Hazard Categories					
			Cat. 2	Cat. 3	M/RAD	M/CHEM	L/RAD	L/ENS	L/CHEM	L/ENV
3	Support Building	SNM							X	
4	Plutonium Building	SNM	X							
5	Warehouse	SNM							X	
7	Calcium Building	SNM						X		
41*	Nuclear Materials Storage Facility	SNM	X							

*The Nuclear Materials Storage Facility is not operational and is being renovated to bring it up to current nuclear facility standards.

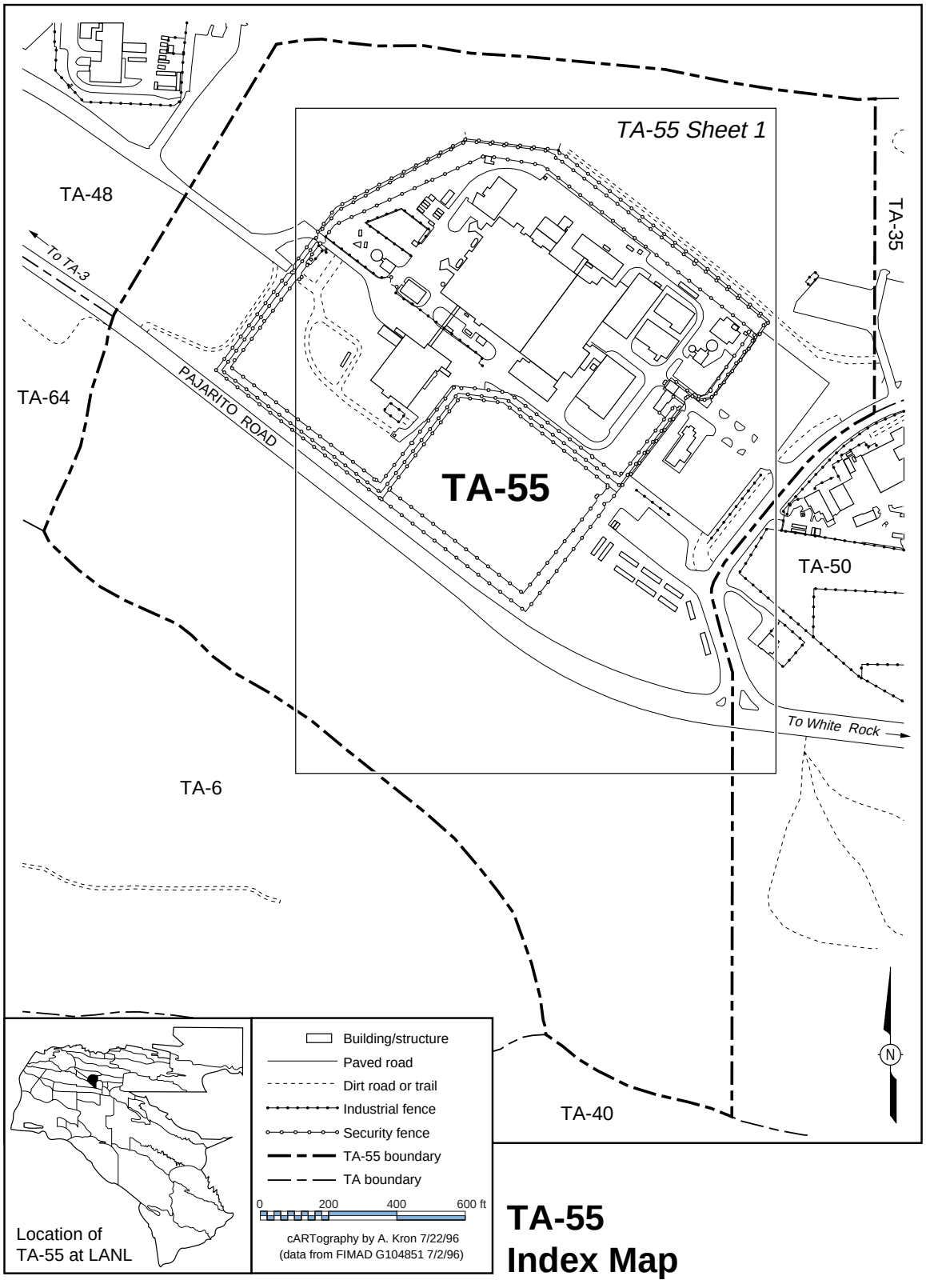


Figure 4-32. Map of TA-55, Plutonium Facility Site—Index Map.

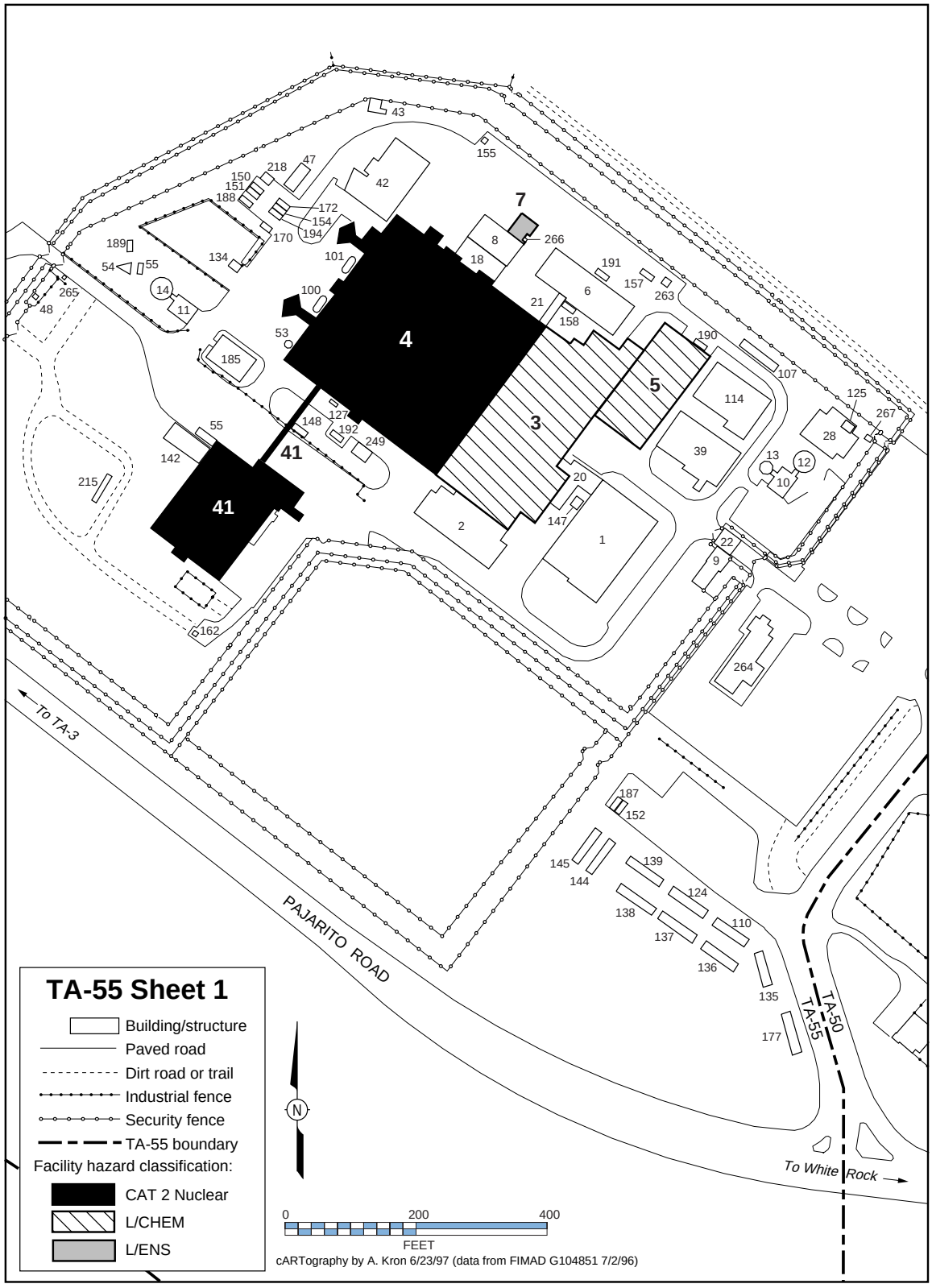


Figure 4-32. Map of TA-55, Plutonium Facility Site—Sheet 1.

4.33 TA-57, Fenton Hill Site

4.33.1 Site Description

TA-57 [Figure 4-33 (index map of TA-57)] is located about 28 mi (45 km) west of Los Alamos on the southern edge of the Valles Caldera in the Jemez Mountains. The 15-acre (6-ha) site lies on land leased from the US Forest Service, and the Laboratory's use of the land is governed by a memorandum of understanding between the Laboratory and the Forest Service. The site includes the main area; a 2-acre (0.81-ha), 5-million-gallon (18,927,060-L) pond and two smaller ponds; and a housing area shared with the Forest Service. TA-57 is the location of environmental research, including the Laboratory's Hot Dry Rock Geothermal Project and the Milagro Project, which investigates astronomical events.

Fenton Hill was originally developed to study the use of hot dry rocks to generate geothermal energy. The Geothermal Project has been completed, and the site is now being proposed as the location for an astrophysics observatory. The proposed observatory would be dedicated to observations of objects that brighten in the night sky then quickly fade away. These objects include supernovae, flare stars, and brief, very-high-energy flashes from space called gamma-ray bursts. The proposed facility may also contribute to catalogs of near-Earth objects, including potential Earth-crossing comets and asteroids.

The instruments planned for the Fenton Hill site are designed specifically to observe and record ephemeral flickers and flashes. As envisioned, the site will be home to a suite of telescopes dedicated to optical observations set for short time scales—from fractions of a second to hours. The short-time-scale exposures will allow broad searches of the sky and a chance to catch transient optical events before they vanish.

The first optical telescope planned for Fenton Hill will be the Research and Education Automatically Controlled Telescope (REACT). REACT will be an automatic and robotic telescope that allows astronomers and astronomy students to search the sky from their computer terminals. REACT will have a narrow, one-half-degree field of view with high resolution. In its event-alert mode, REACT will automatically swing around to take a series of 1-min exposures to catch any optical signals coinciding with gamma-ray transients seen by other sky-watching instruments. REACT will be housed in a weather-sensing dome that will automatically close in the rain.

The next instrument proposed for the site will be the Robotic Optical Transient Search Experiment (ROTSE I), a four-barreled system with 200-mm, wide-field lenses on electronic cameras. It will have an intermediate 15° field of view. ROTSE will use telemetry data from the National Aeronautics and Space Administration's (NASA's) Compton Gamma-Ray Observatory to direct its array of cameras toward burst events as they occur. Alerts will come from the fast-alert system developed by NASA at Goddard Space Flight Center. ROTSE will respond within 10 s of a burst onset.

ROTSE will probably respond to alerts from BACODINE about once a week. The rest of the time ROTSE will spend its time watching comets. If a comet in the Kuiper Belt beyond Neptune happens to pass in front of our view of a star, ROTSE will record the tenth-of-a-second dip in light intensity from that star. The data may help detect and track comets long before they can be spotted from their own optical emissions.

The new telescopes will stand beside an unusual observatory already in place at Fenton Hill called Milagro (the Milagro Project). Using more than 700 sensitive light detectors submerged in a 5-million-gallon (18,927,060-L) artificial pond, plus another 200 detectors arrayed around the pond, Milagro will record signals from high-energy cosmic emissions, including gamma-ray bursts. Milagro will stare continuously at the sky from horizon to horizon, day and night, acting like a camera

whose shutter is always open. When Milagro alerts ROTSE, it will be watching the same piece of the sky, increasing the odds of capturing transient flashes.

The water in the main pond is filtered to maintain its purity for use in environmental research.

4.33.2 Facilities Description

4.33.2.1 Facility Hazard Categories

4.33.2.1.1 Nuclear Facility Hazard Categories

No buildings at TA-57 are categorized as nuclear facilities.

4.33.2.1.2 Non-Nuclear Facility Hazard Categories

No buildings at TA-57 are categorized as non-nuclear facilities.

4.33.2.2 Nonhazardous Facilities

The Fenton Hill Site has 25 structures, including an office, a laboratory, storage sheds, a warehouse, wells, pump houses, and a guard station, all of which are designated nonhazardous.

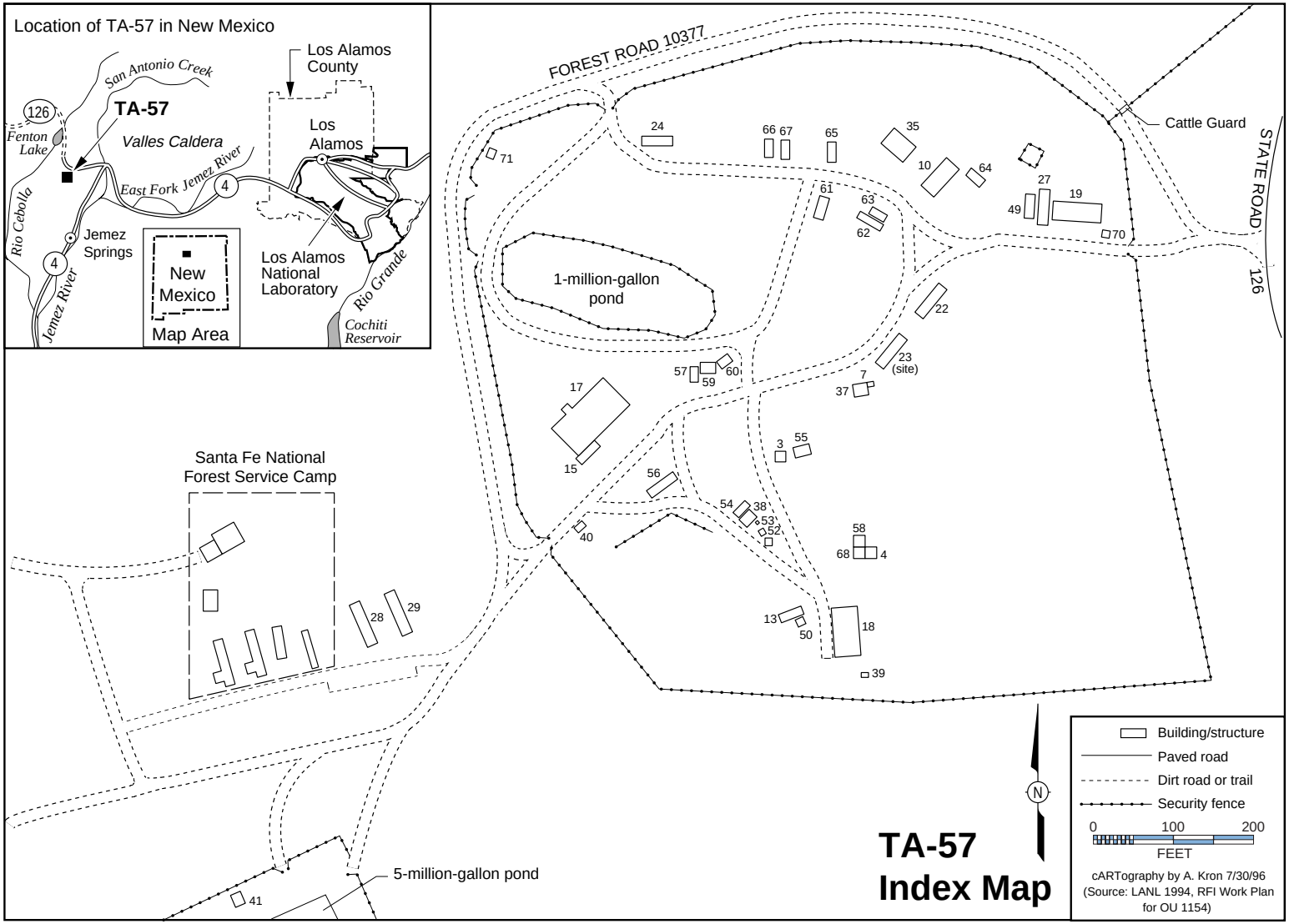


Figure 4-33. Map of TA-57, Fenton Hill Site—Index Map.

4.34 TA-58, Two Mile North Site

4.34.1 Site Description

The Two Mile North Site at TA-58 [Figure 4-34 (index map of TA-58)], which is reserved for future use, is located near the Laboratory's northwest border on Two Mile Mesa North. Three structures, all trailers used for storage, are located at the site, which is otherwise unoccupied. A fitness trail passes through TA-58, so there are often walkers, joggers, and bicyclists at the site.

4.34.2 Facilities Description

4.34.2.1 Facility Hazard Categories

4.34.2.1.1 Nuclear Facility Hazard Categories

No buildings at TA-58 are categorized as nuclear facilities.

4.34.2.1.2 Non-Nuclear Facility Hazard Categories

No buildings at TA-58 are categorized as non-nuclear facilities.

4.34.2.2 Nonhazardous Facilities

The three storage trailers (which do not appear on the map) are considered to be nonhazardous facilities.

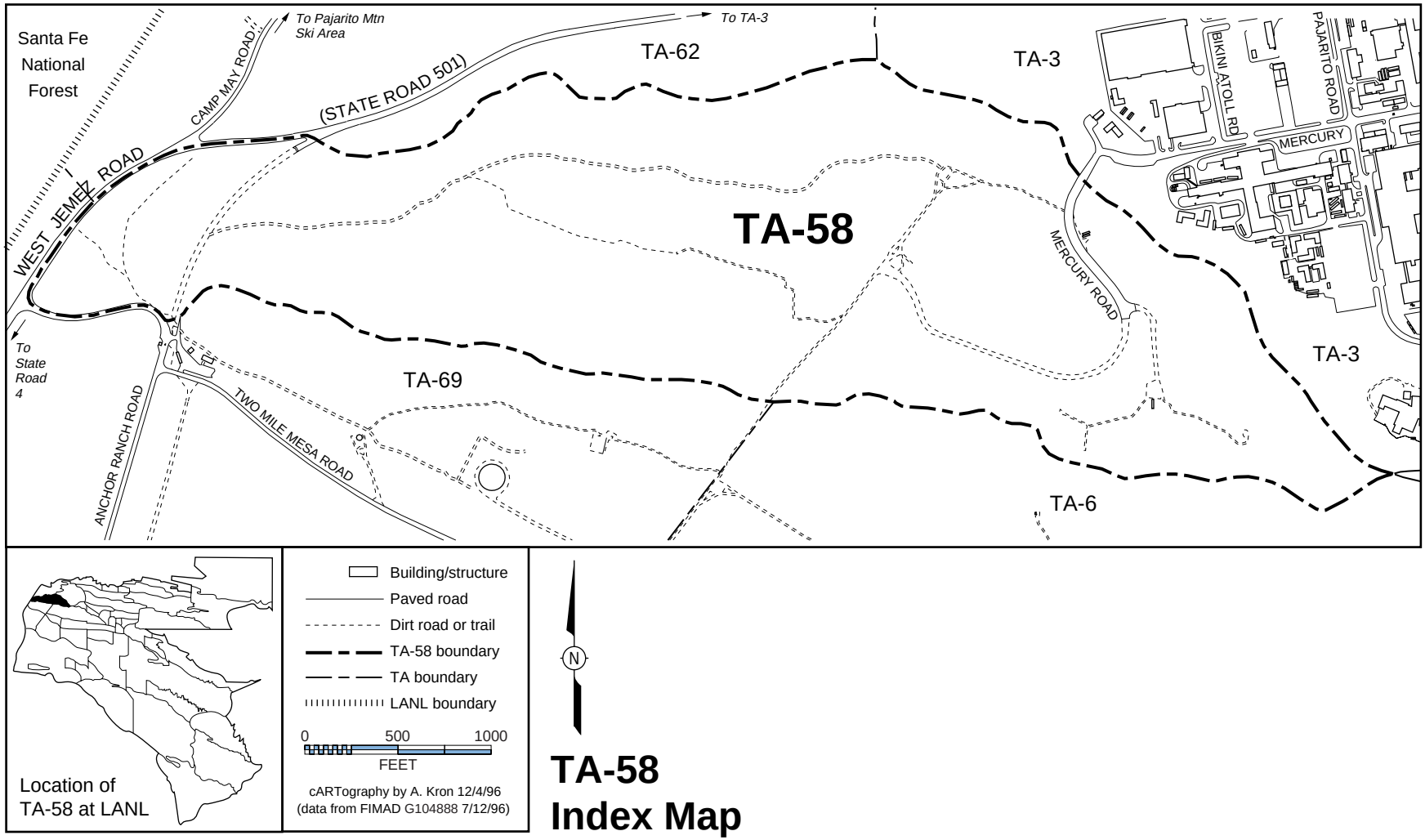


Figure 4-34. Map of TA-58, Two Mile North Site—Index Map.

4.35 TA-59, Occupational Health Site

4.35.1 Site Description

TA-59 [Figure 4-35 (index map of TA-39)] is located on the south side of Pajarito Road adjacent to TA-3 and contains 23 facilities, all of which are categorized as nonhazardous. Groups at TA-59 provide support services for the entire Laboratory in the areas of health physics, risk management, industrial hygiene and safety, policy and program analysis, air quality, water quality and hydrology, hazardous and solid waste analysis, and radiation protection.

4.35.2 Facilities Description

4.35.2.1 Facility Hazard Categories

4.35.2.1.1 Nuclear Facility Hazard Categories

No buildings at TA-59 are categorized as nuclear facilities.

4.35.2.1.2 Non-Nuclear Facility Hazard Categories

No buildings at TA-59 are categorized as non-nuclear facilities.

4.35.2.2 Nonhazardous Facilities

The Occupational Health Laboratory (Building 1, Figure 4-35, Sheet 1) and administrative and other office operations occupy most of the buildings at TA-59. Building 1 houses a combination of offices and laboratories. The laboratories include low-level radiochemistry and chemical analysis in support of the Laboratory's environment, safety, and health programs. The Laboratory's emergency operations center is also housed in the basement of Building 1.

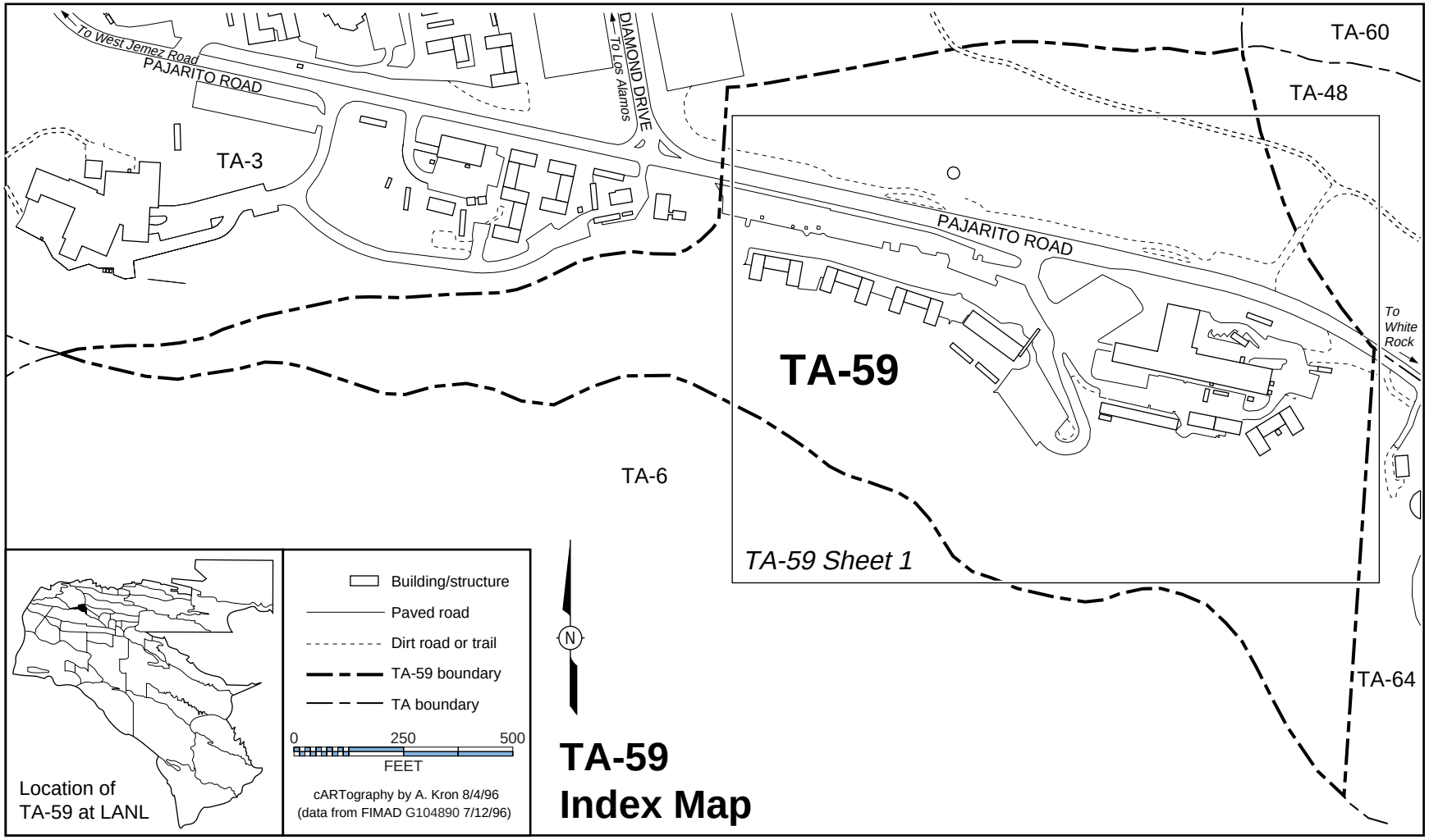


Figure 4-35. Map of TA-59, Occupational Health Site—Index Map.

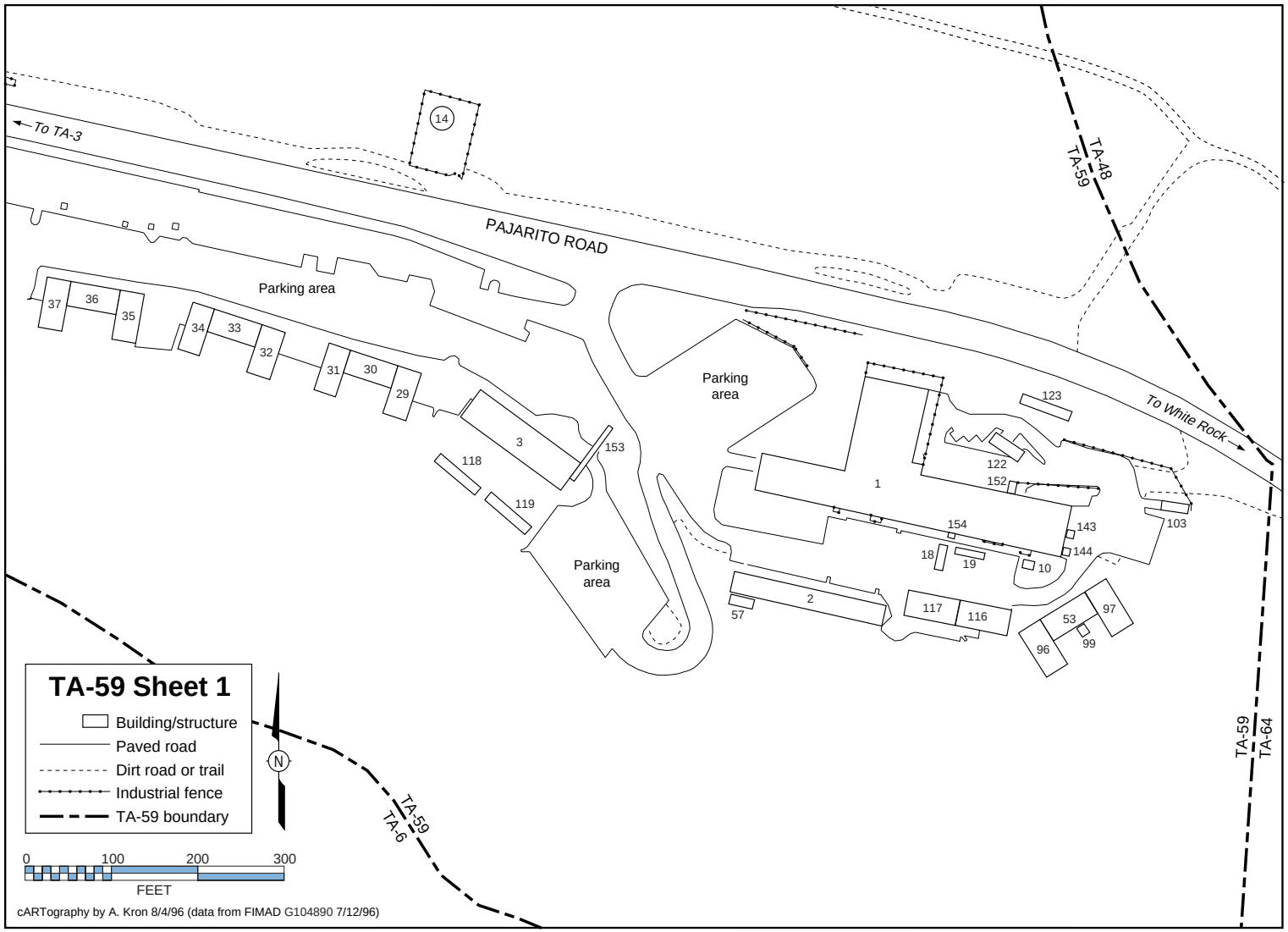


Figure 4-35. Map of TA-59, Occupational Health Site—TA-59, Sheet 1.

4.36 TA-60, Sigma Mesa Site

4.36.1 Site Description

TA-60 [Figure 4-36 (index map of TA-60)] lies between Mortandad Canyon and Sandia Canyon southeast of TA-3. The site is primarily used for physical support and infrastructure activities. Some support services and physical support areas for subcontractors are also located at TA-60. The Nevada Test Site Test Fabrication Facility and a test tower (Buildings 17 and 18, Figure 4-36, Sheet 1) are located in TA-60. Because of the moratorium on testing, these buildings are not currently in use but are being maintained for future use, should testing again become a part of the Laboratory's mission.

4.36.2 Facilities Description

4.36.2.1 Facility Hazard Categories

4.36.2.1.1 Nuclear Facility Hazard Categories

No buildings at TA-60 are categorized as nuclear facilities.

4.36.2.1.2 Non-Nuclear Facility Hazard Categories

No buildings at TA-60 are categorized as non-nuclear facilities.

4.36.2.2 Nonhazardous Facilities

Approximately 80 buildings and structures are located at TA-60, all of which are categorized as nonhazardous. Although categorized as nonhazardous, a pesticide storage facility (Building 28, Figure 4-36, Sheet 1), a number of fuel tanks, and a fuel pumping station (Structure 13) are among these 80 buildings. TA-60 is used as a storage area (Figure 4-36, Sheets 2 and 3) with a number of transportainers, trailers, and storage buildings.

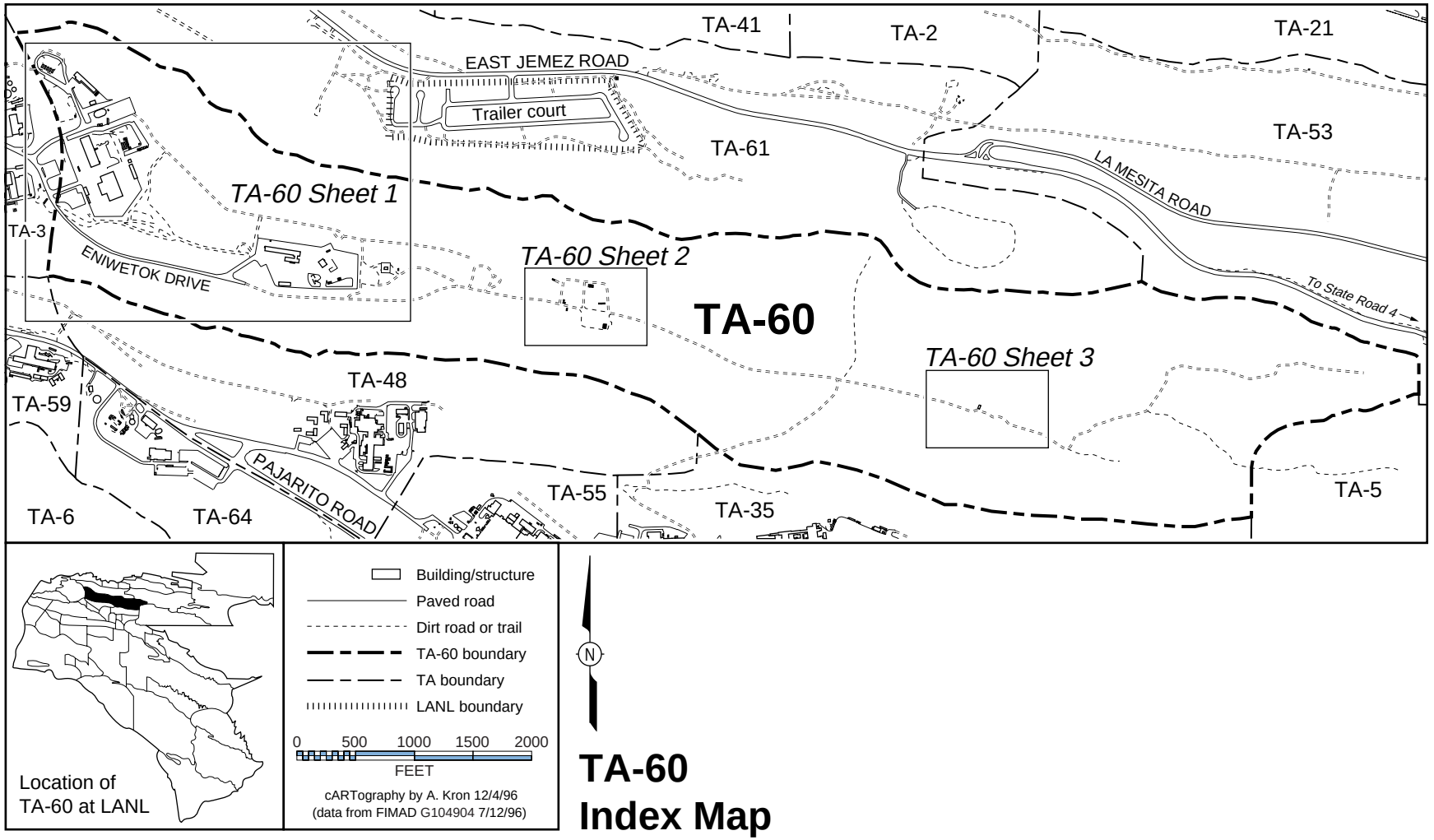


Figure 4-36. Map of TA-60, Sigma Mesa Site—Index Map.

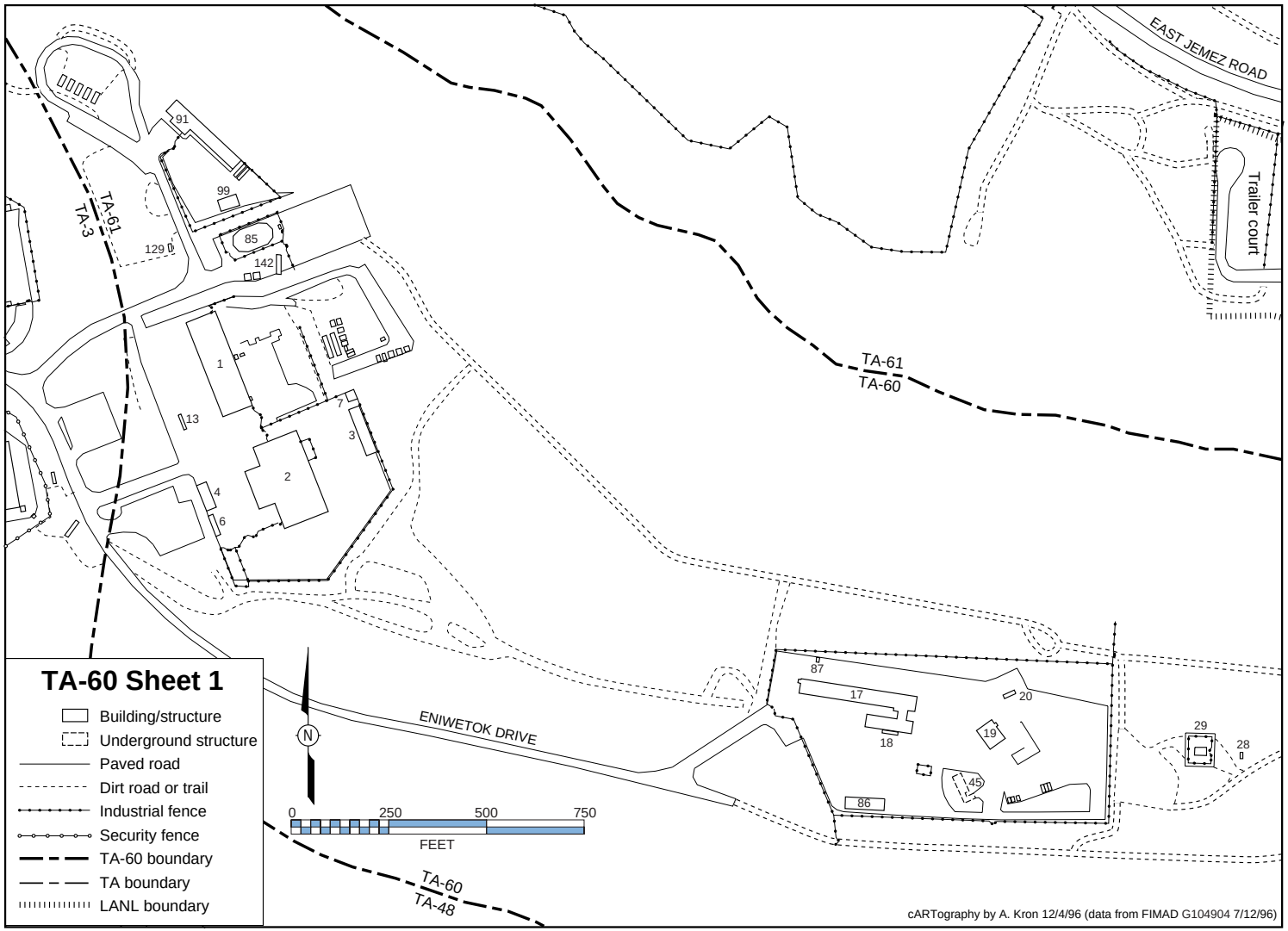
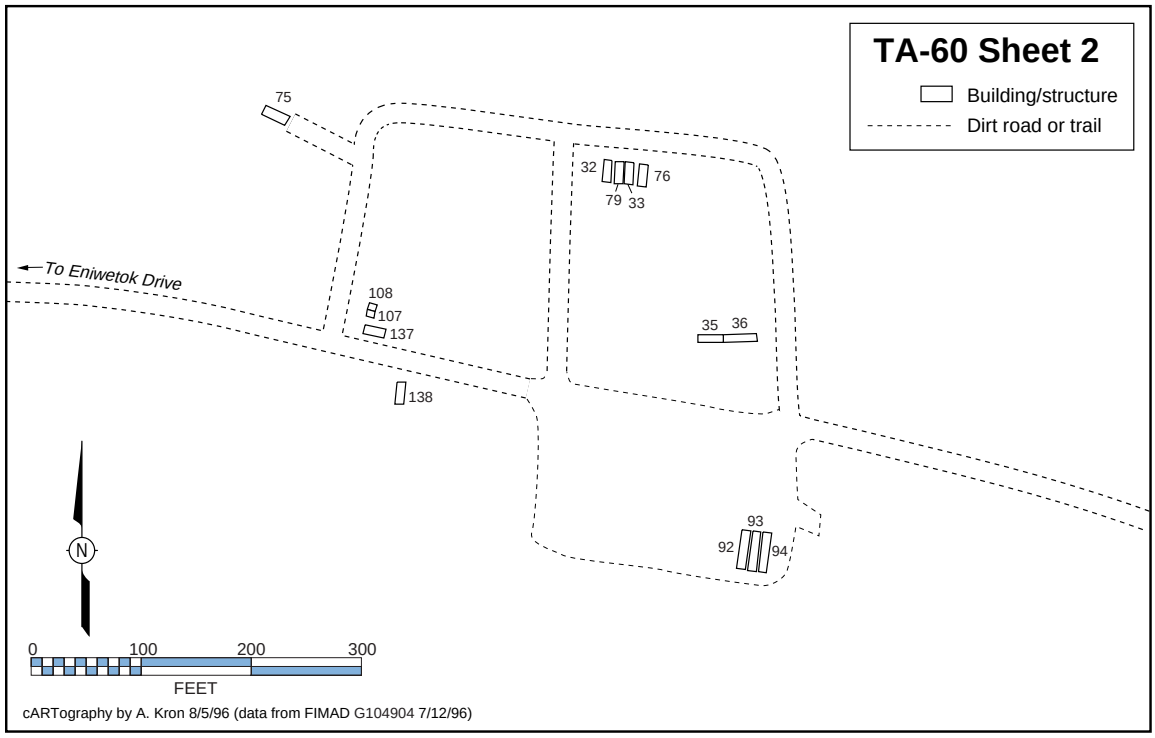


Figure 4-36. Map of TA-60, Sigma Mesa Site—Sheet 1.



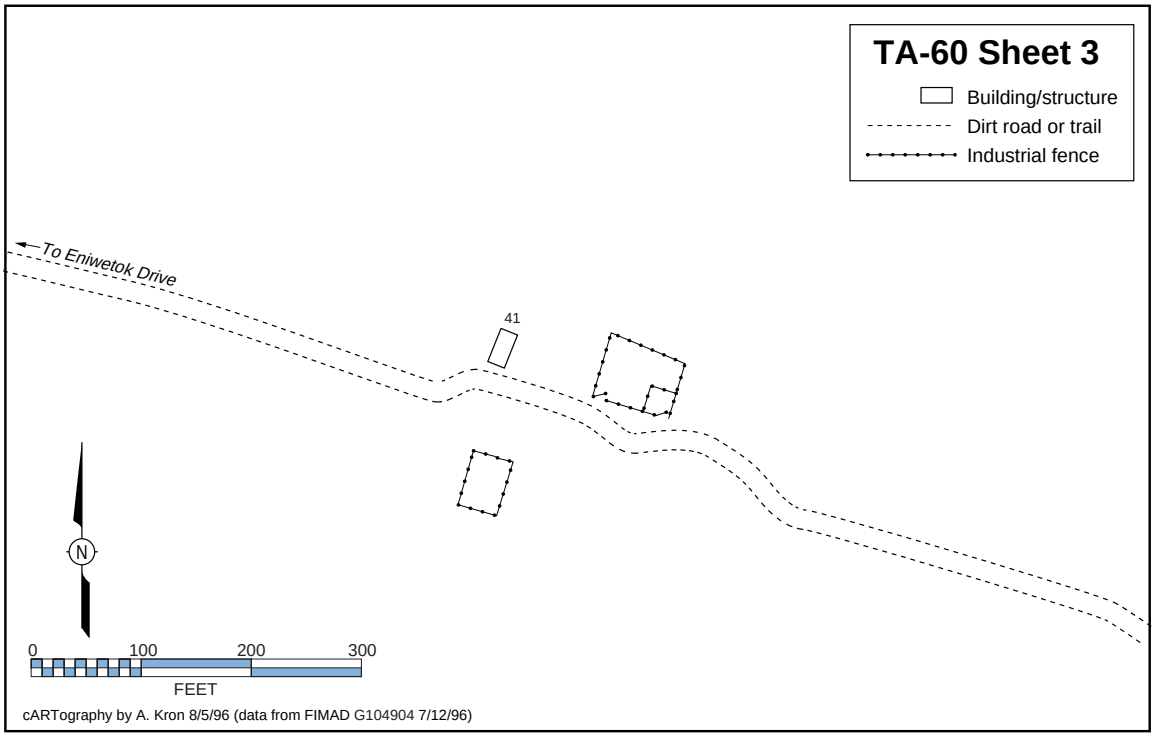


Figure 4-36. Map of TA-60, Sigma Mesa Site—Sheets 2 and 3.

4.37 TA-61, East Jemez Site

4.37.1 Site Description

TA-61 [Figure 4-37 (index map of TA-61)] is a relatively small site that contains physical support and infrastructure facilities. It contains 9 facilities, all designated nonhazardous, which include the sanitary landfill, sewer pump stations, computer model shop, general storage sheds, blower house, and general warehouse storage for maintenance activities performed throughout the Laboratory.

The sanitary landfill (Figure 4-37, Sheet 1) occupies most of TA-61. Its main purpose is to serve as a permanent repository for nontoxic waste—radionuclides and toxic chemical wastes are not accepted at the landfill. Although significant environmental impacts could be associated with the landfill, there appears to be little or no opportunity for accidents that would cause unusual impacts either on- or offsite. The sanitary landfill is operated by the County of Los Alamos.

In cooperation with the county, the Laboratory has installed radiological monitoring equipment to ensure that any radioactive materials that might get into any waste going to the landfill are identified by alarm.

4.37.2 Facilities Description

4.37.2.1 Facility Hazard Categories

4.37.2.1.1 Nuclear Facility Hazard Categories

No buildings at TA-61 are categorized as nuclear facilities.

4.37.2.1.2 Non-Nuclear Facility Hazard Categories

No buildings at TA-61 are categorized as non-nuclear facilities.

4.37.2.2 Nonhazardous Facilities

All of the buildings located at TA-61 are designated nonhazardous, i.e., no unusual hazards exist that the public does not normally encounter; however, the potential exists for industrial accidents.

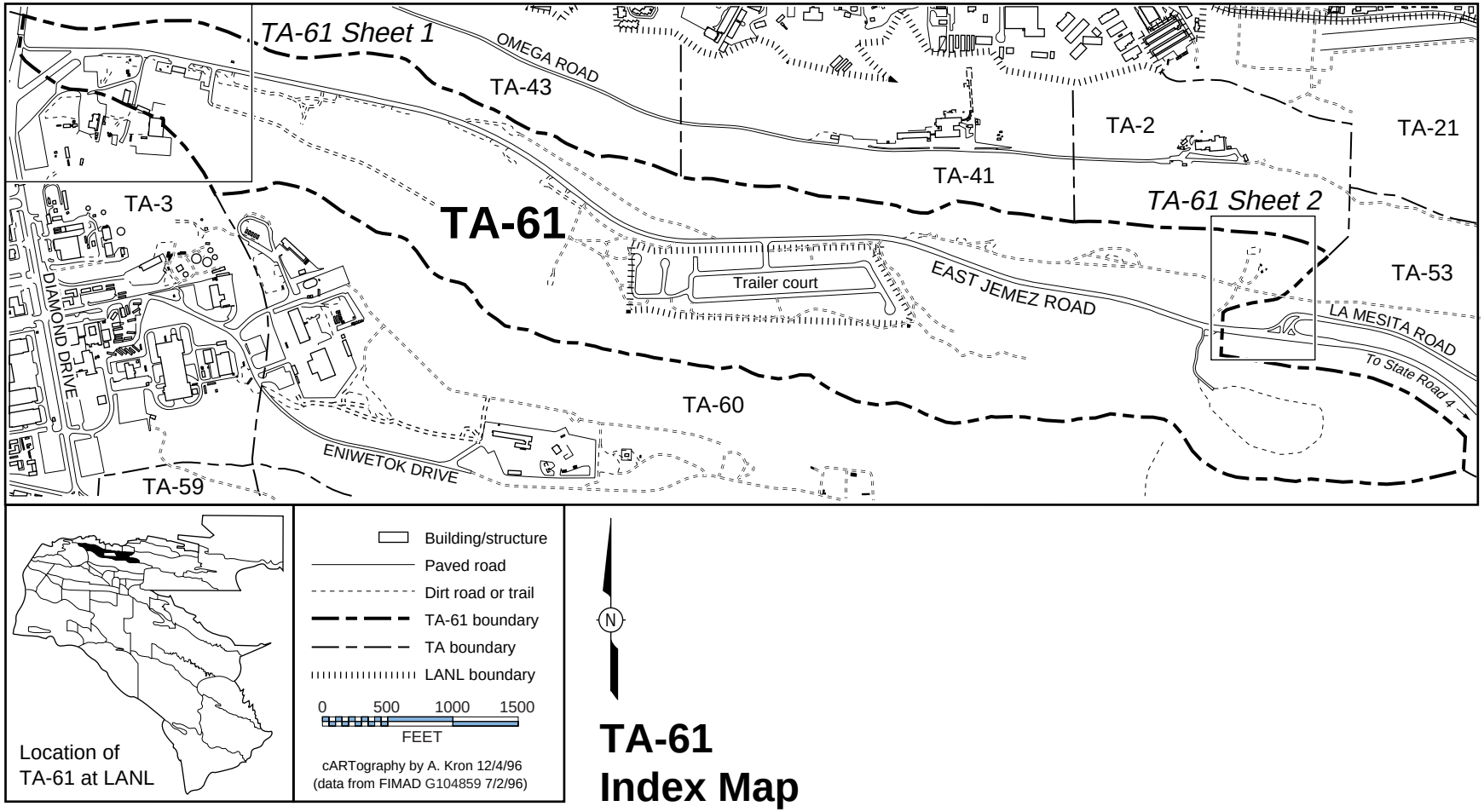


Figure 4-37. Map of TA-61, East Jemez Site—Index Map.

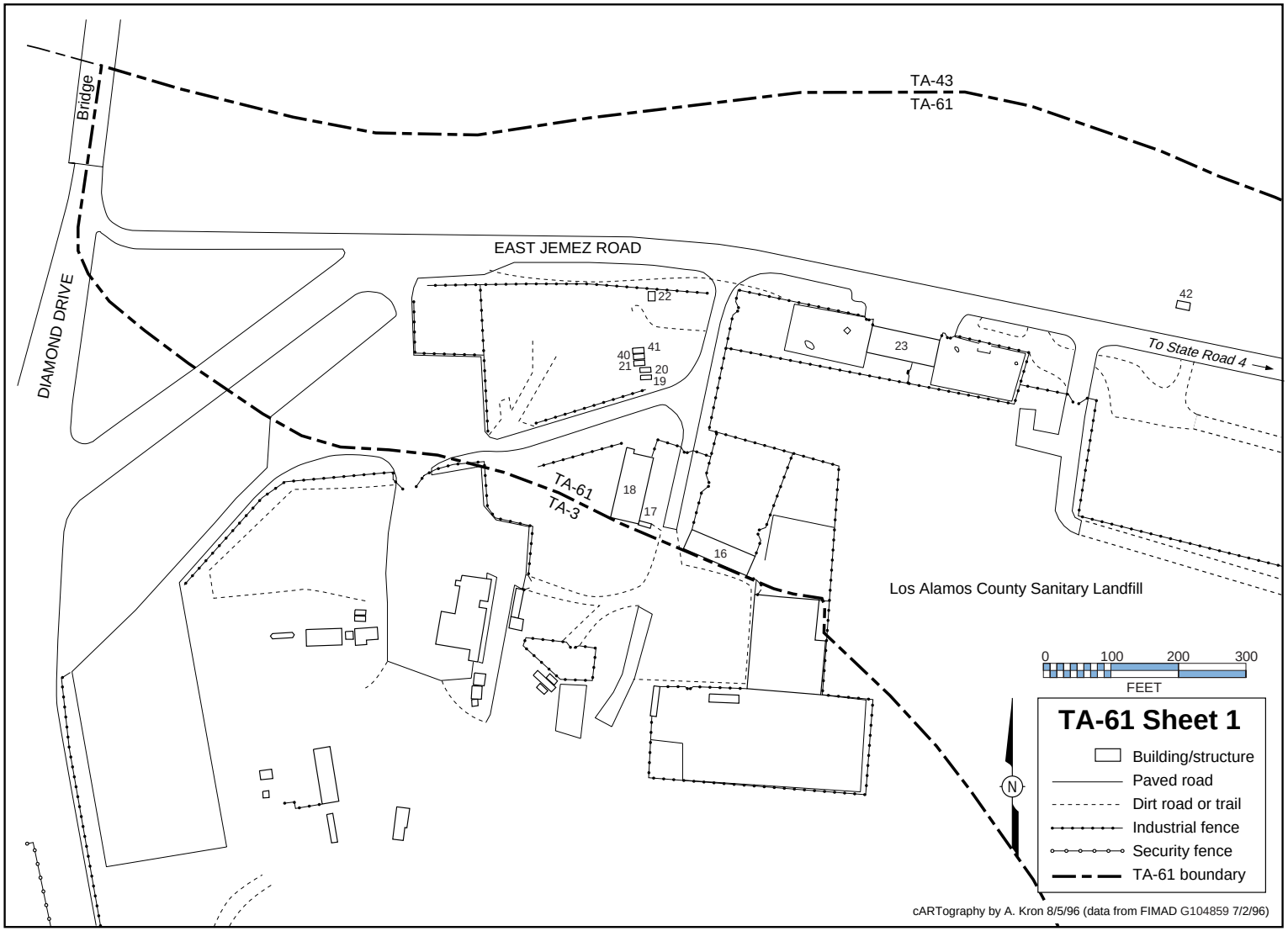


Figure 4-37. Map of TA-61, East Jemez Site—Sheet 1.

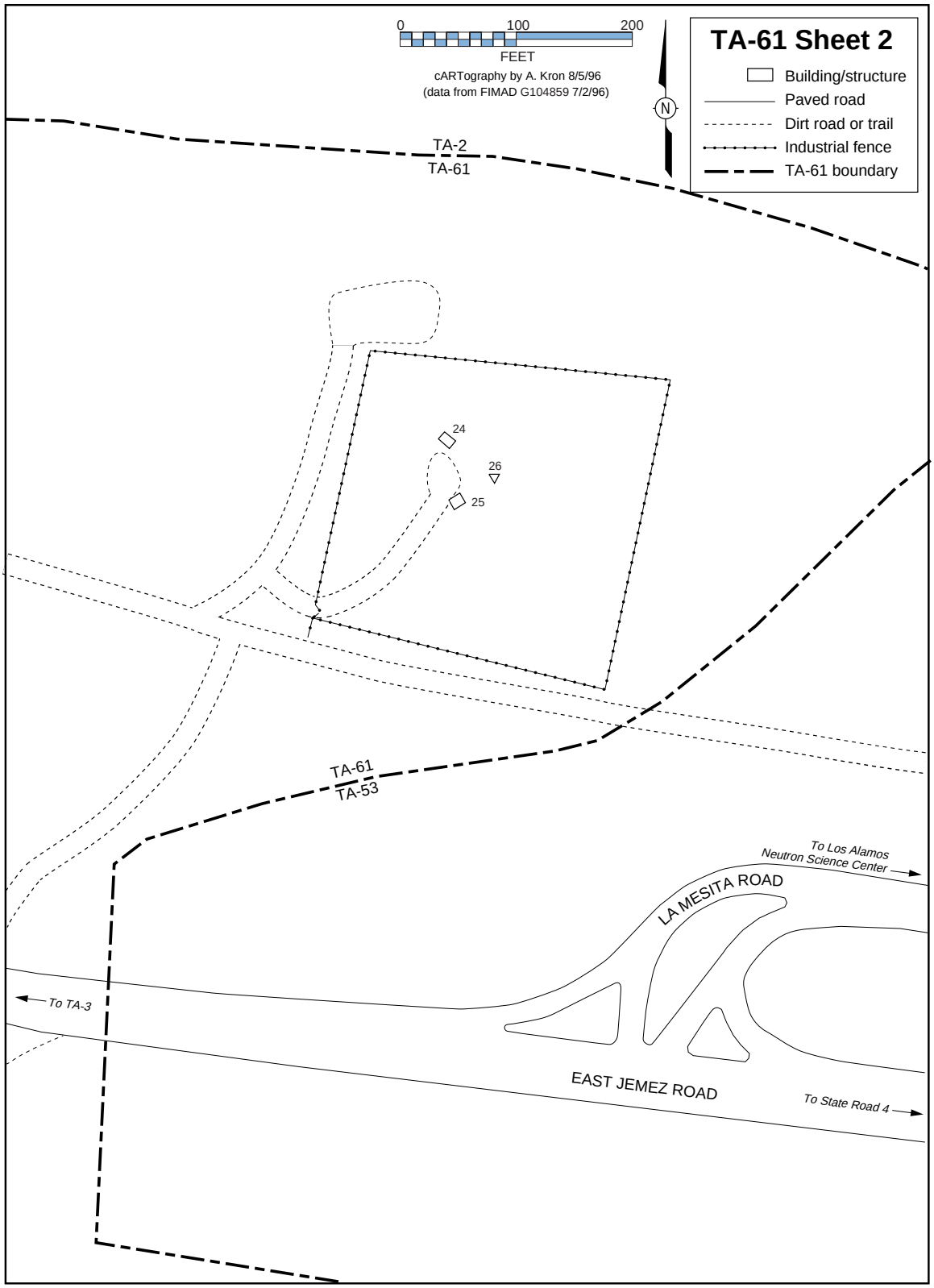


Figure 4-37. Map of TA-61, East Jemez Site—Sheet 2.

4.38 TA-62, Northwest Site

4.38.1 Site Description

TA-62 [Figure 4-38 (index map of TA-62)], which currently has no major structures, is reserved as a multiple-use area for such future needs as experimental science, office space for industrial partners, environmental research, and buffer zones. It is located along the northwest corner of the Laboratory, adjacent to Forest Service and Los Alamos County land.

4.38.2 Facilities Description

4.38.2.1 Facility Hazard Categories

4.38.2.1.1 Nuclear Facility Hazard Categories

No buildings at TA-62 are categorized as nuclear facilities.

4.38.2.1.2 Non-Nuclear Facility Hazard Categories

No buildings at TA-62 are categorized as non-nuclear facilities.

4.38.2.2 Nonhazardous Facilities

One structure has been identified at TA-62—a water tank, which is designated nonhazardous.

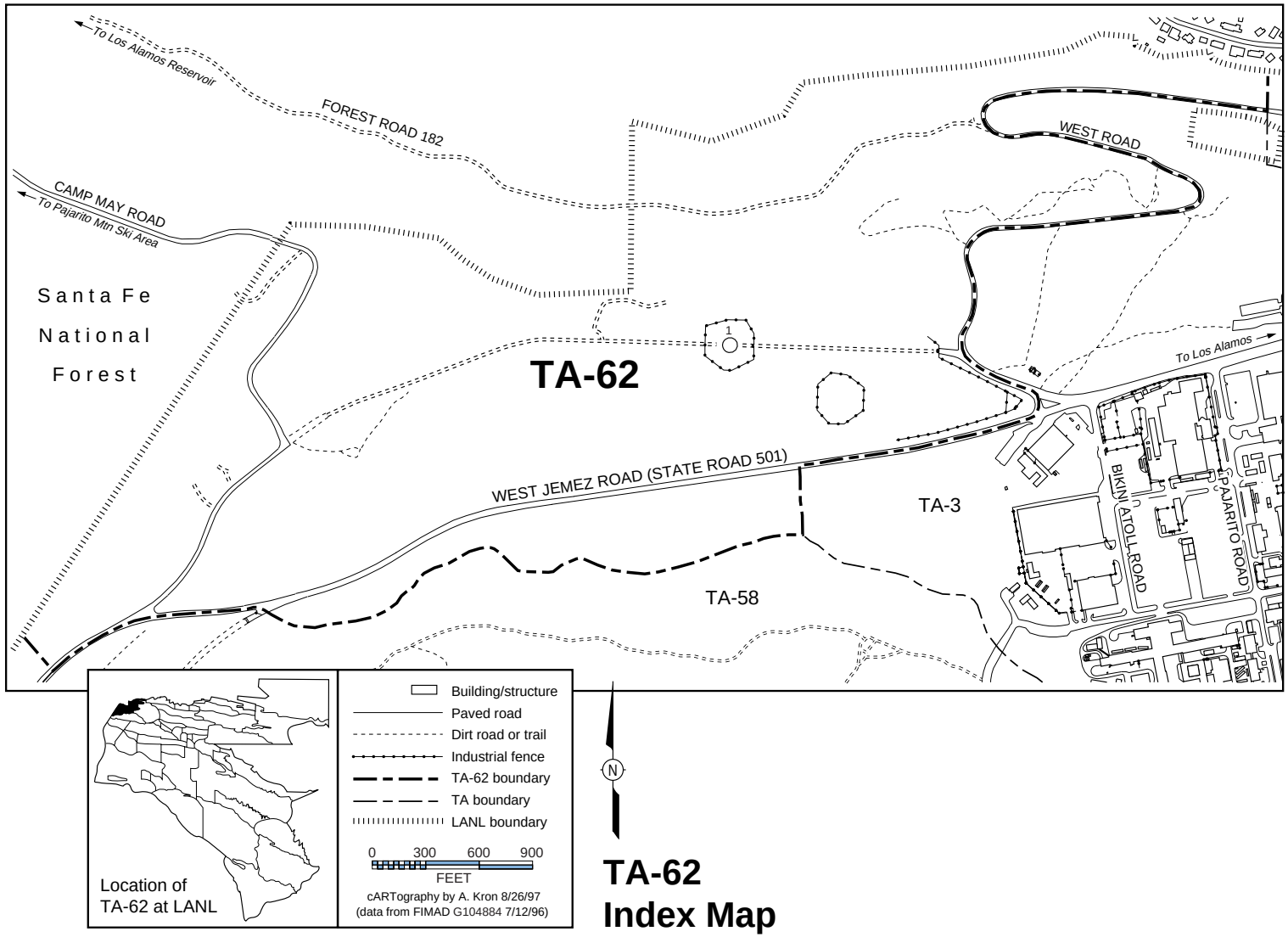


Figure 4-38. Map of TA-62, Northwest Site—Index Map.

4.39 TA-63, Pajarito Service Area

4.39.1 Site Description

Currently, physical support facilities and trailer and transportable office space are located at TA-63 [Figure 4-39 (index map of TA-63 and Sheet 1)]. All of these buildings (approximately 30 structures) are considered nonhazardous.

The technical area is currently expanding to accommodate environmental and waste management functions and facilities. Future plans for the site include a hazardous waste treatment facility and a radioactive liquid waste treatment facility. Both of these projects are currently in the planning and design phase.

4.39.2 Facilities Description

4.39.2.1 Facility Hazard Categories

4.39.2.1.1 Nuclear Facility Hazard Categories

No buildings at TA-63 are categorized as nuclear facilities.

4.39.2.1.2 Non-Nuclear Facility Hazard Categories

No buildings at TA-63 are categorized as non-nuclear facilities.

4.39.2.2 Nonhazardous Facilities

All of the buildings at TA-46 are considered to be nonhazardous.

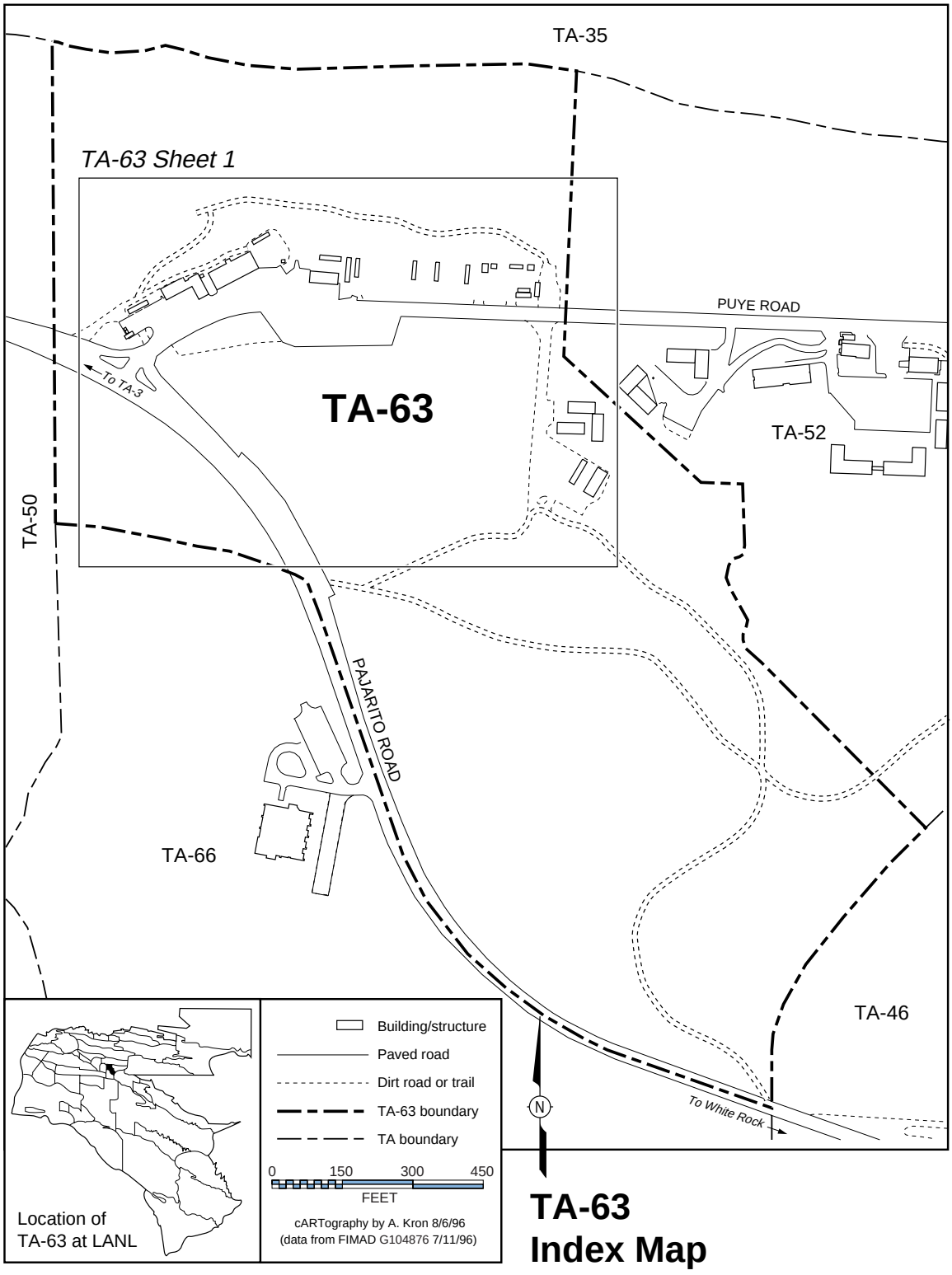


Figure 4-39. Map of TA-63, Pajarito Service Area—Index Map.

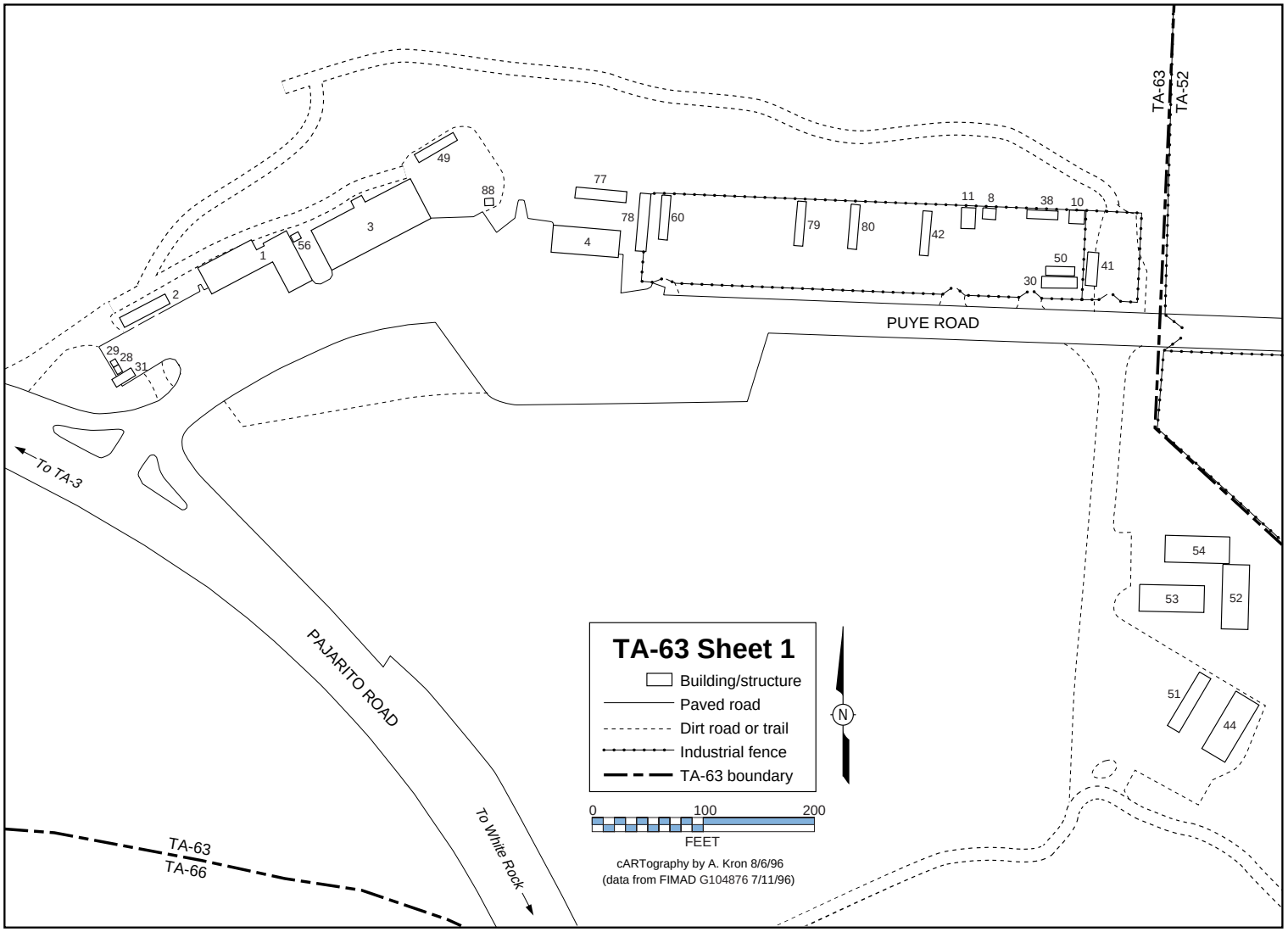


Figure 4-39. Map of TA-63, Pajarito Service Area—Sheet 1.

4.40 TA-64, Central Guard Site

4.40.1 Site Description

TA-64 [Figure 4-40 (index map of TA-64 and Sheet 1)] is the site of the Central Guard Facility, which is operated by the Laboratory's subcontractor for security (currently, Protection Technology of Los Alamos). This facility's primary function is housing the subcontractor's administrative offices. In addition, 26 other structures are located at TA-64, all of which are categorized as nonhazardous.

When this TA was originally set up, the guard facility, some storage sheds, and several water tanks were already present. Today, the site also provides office and storage space for the Laboratory's Hazardous Materials Response Team (Buildings 39 and 43). The remaining facilities consist of trailers, transportainers, sheds, and military shelters used for general storage by the Laboratory and Protection Technology of Los Alamos.

4.40.2 Facilities Description

4.40.2.1 Facility Hazard Categories

4.40.2.1.1 Nuclear Facility Hazard Categories

No buildings at TA-64 are categorized as nuclear facilities.

4.40.2.1.2 Non-Nuclear Facility Hazard Categories

No buildings at TA-64 are categorized as non-nuclear facilities.

4.40.2.2 Nonhazardous Facilities

All 27 of the structures at TA-64 are categorized as nonhazardous.

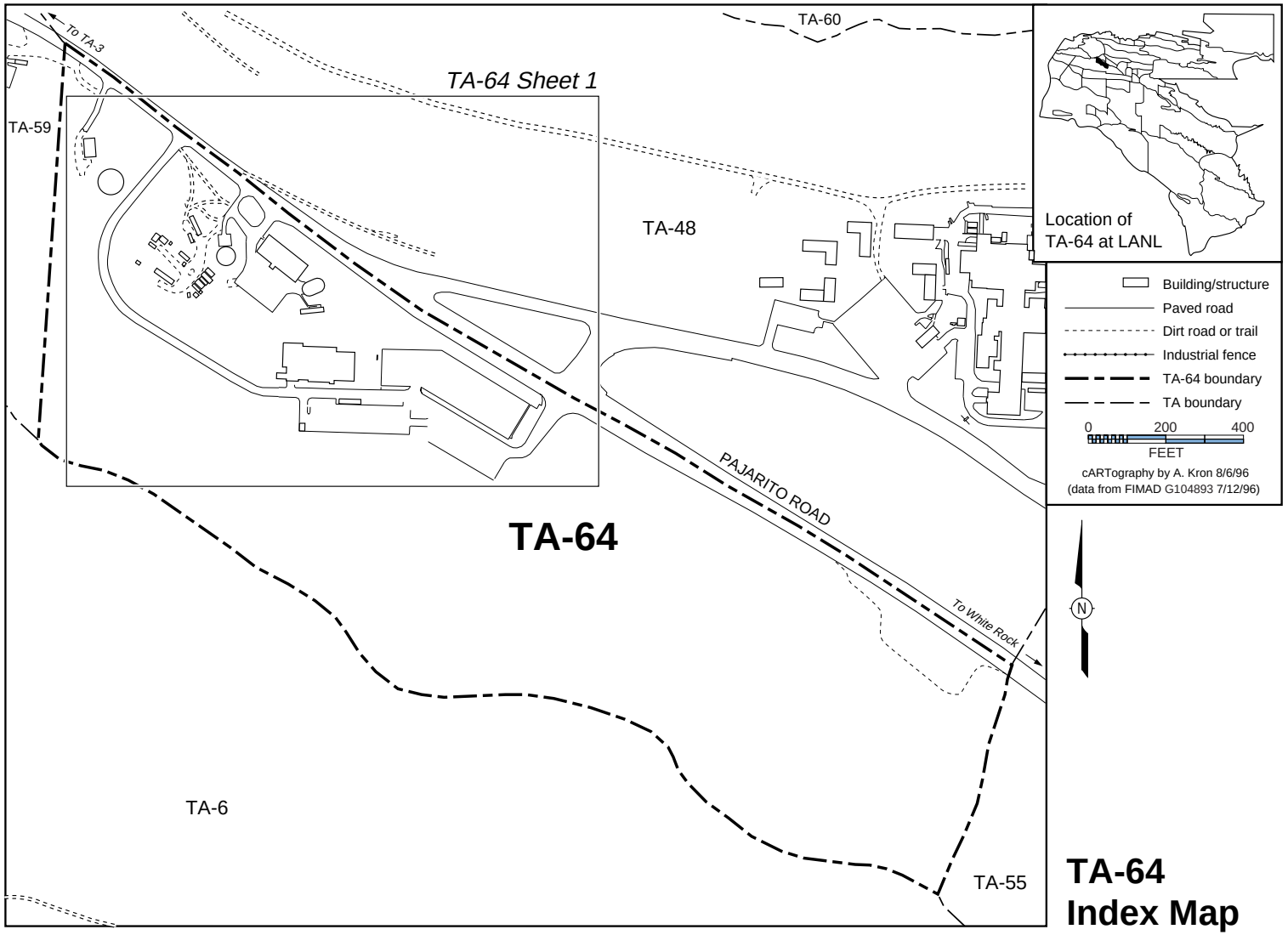


Figure 4-40. Map of TA-64, Central Guard Site—Index Map.

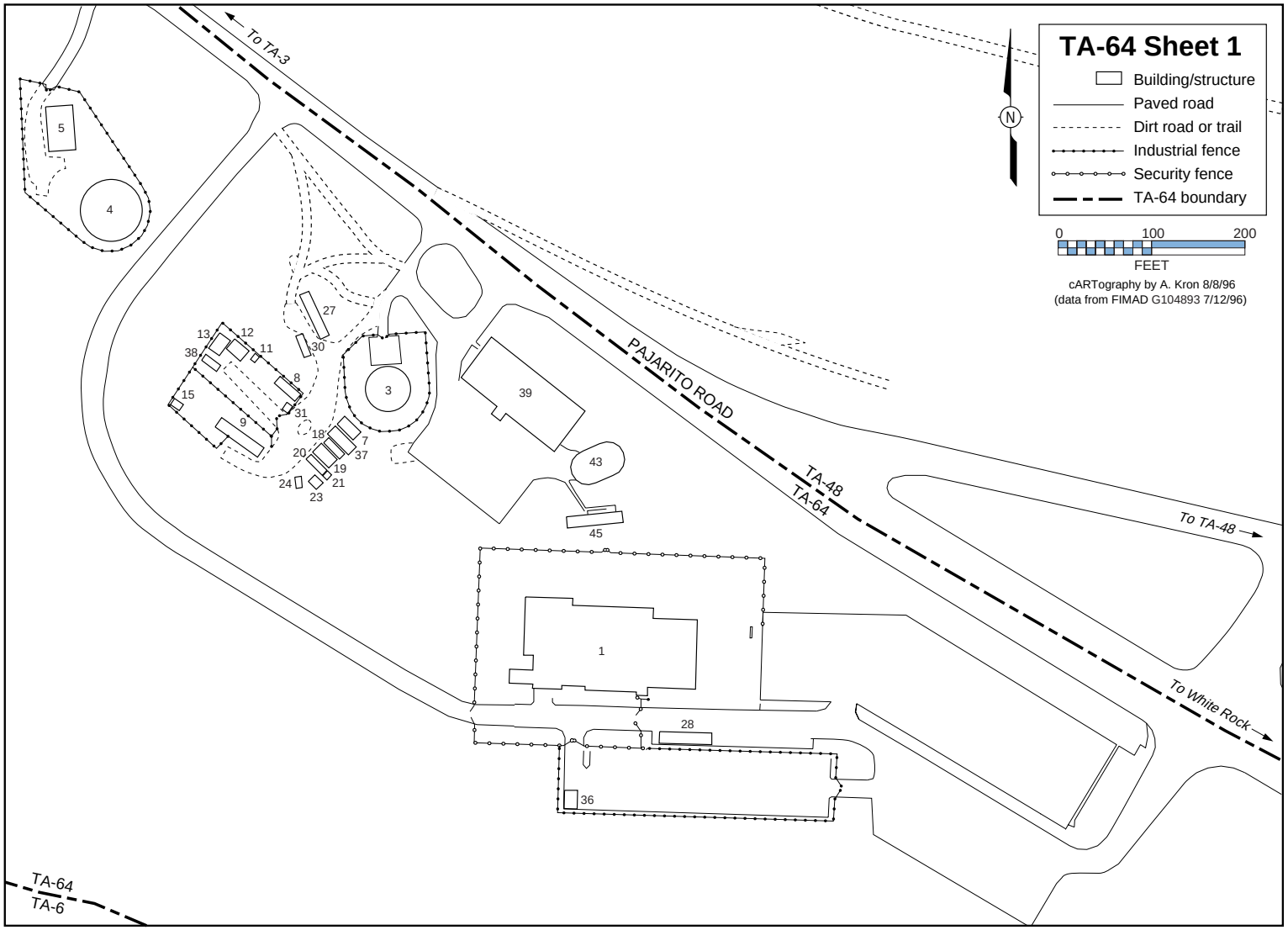


Figure 4-40. Map of TA-64, Central Guard Site—Sheet 1.

4.41 TA-66, Central Technical Support Site

4.41.1 Site Description

TA-66 [Figure 4-41 (index map of TA-66)], located on the southeast side of Pajarito Road, is the site of the Laboratory's industrial partnership programs. The Advanced Technology Assessment Center—the only facility at this site—provides office and technical space for technical transfer and other industrial partnership activities.

4.41.2 Facilities Description

4.41.2.1 Facility Hazard Categories

4.41.2.1.1 Nuclear Facility Hazard Categories

No buildings at TA-66 are categorized as nuclear facilities.

4.41.2.1.2 Non-Nuclear Facility Hazard Categories

No buildings at TA-66 are categorized as non-nuclear facilities.

4.4.2.2 Nonhazardous Facilities

Building 1 (the Advanced Technology Assessment Center) is categorized as nonhazardous.

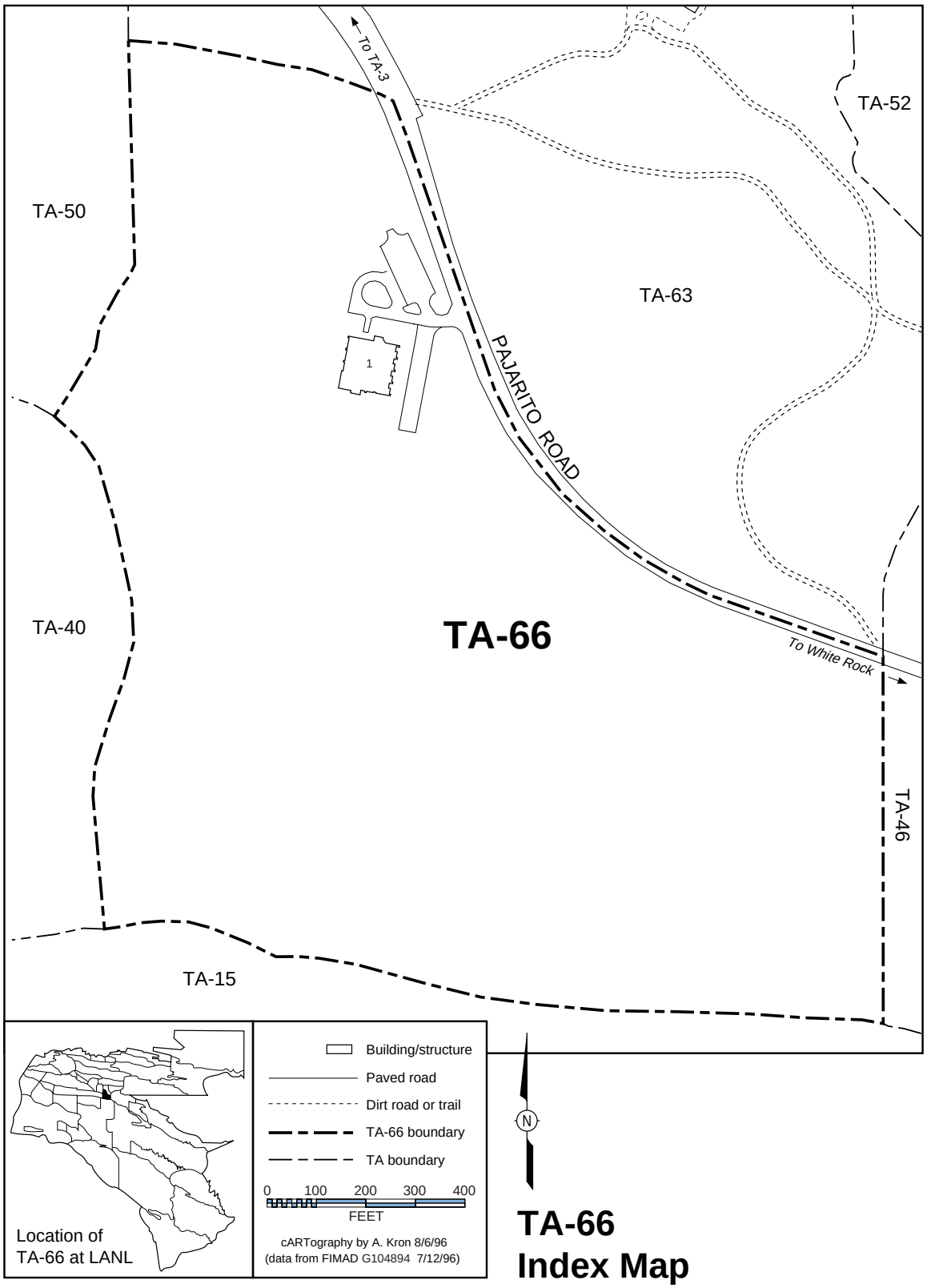


Figure 4-41. Map of TA-66, Central Technical Support Site—Index Map.

4.42 TA-67, Pajarito Mesa Site

4.42.1 Site Description

TA-67 [Figure 4-42 (index map of TA-67)] is a buffer zone, which was designated as a technical area in 1989. No operations or facilities are currently located there. TA-67 includes the location of the former TA-12 (also known as L Site), which was used from the 1940s to the mid-1950s as a firing site and dynamic testing area. The facilities associated with TA-12 activities have long been removed. The area also contains significant archaeological sites.

4.42.2 Facilities Description

Because there are no structures at TA-67, discussion in this section is omitted.

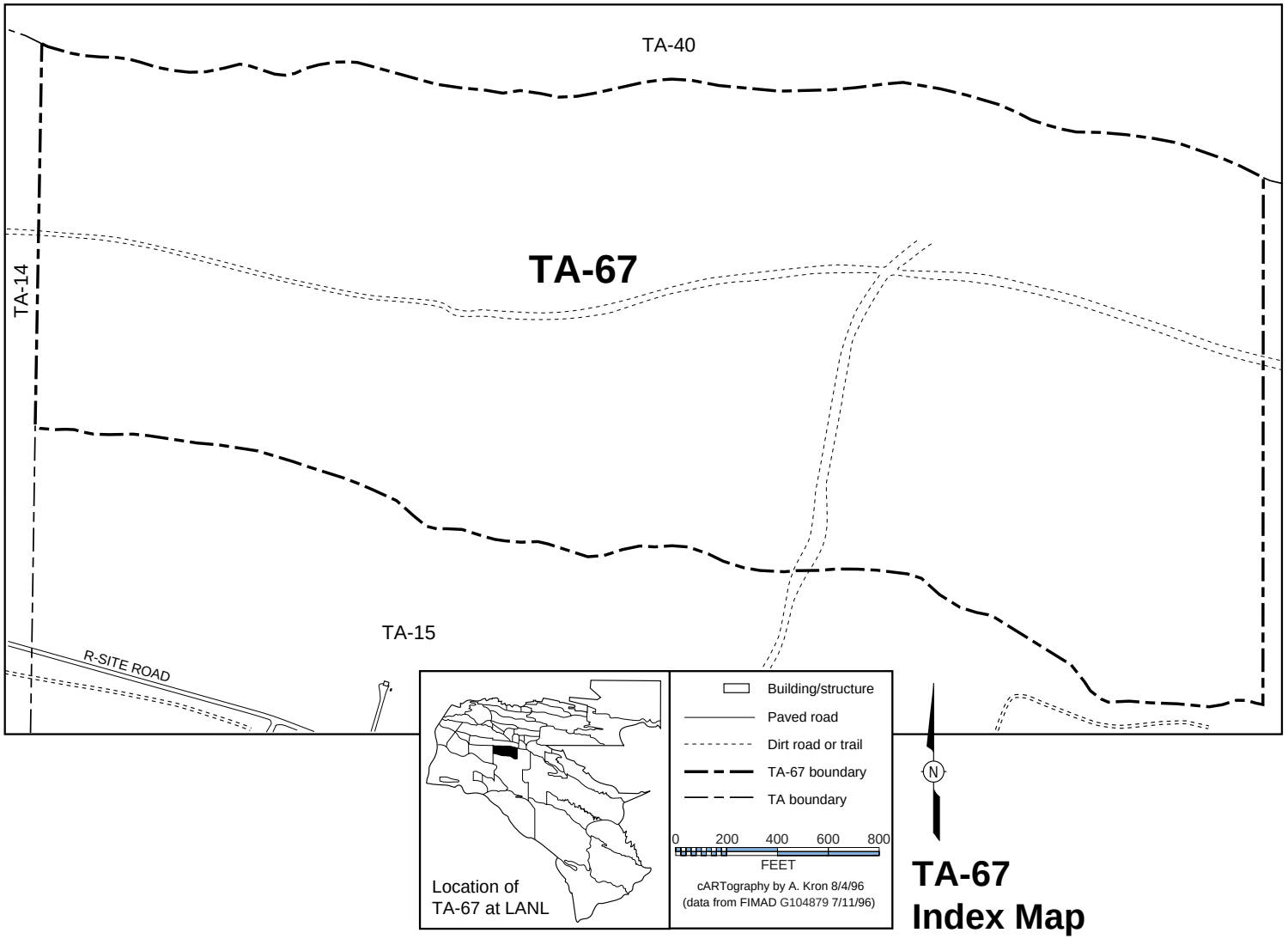


Figure 4-42. Map of TA-67, Pajarito Mesa Site—Index Map.

4.43 TA-68, Water Canyon Site

4.43.1 Site Description

TA-68, Water Canyon Site [Figure 4-43 (index map of TA-68)], which is located in the southern portion of the Laboratory, is a dynamic testing area that contains archaeological and environmental study areas. TA-68 has no structures.

4.43.2 Facilities Description

Because there are no structures at TA-68, discussion in this section is omitted.

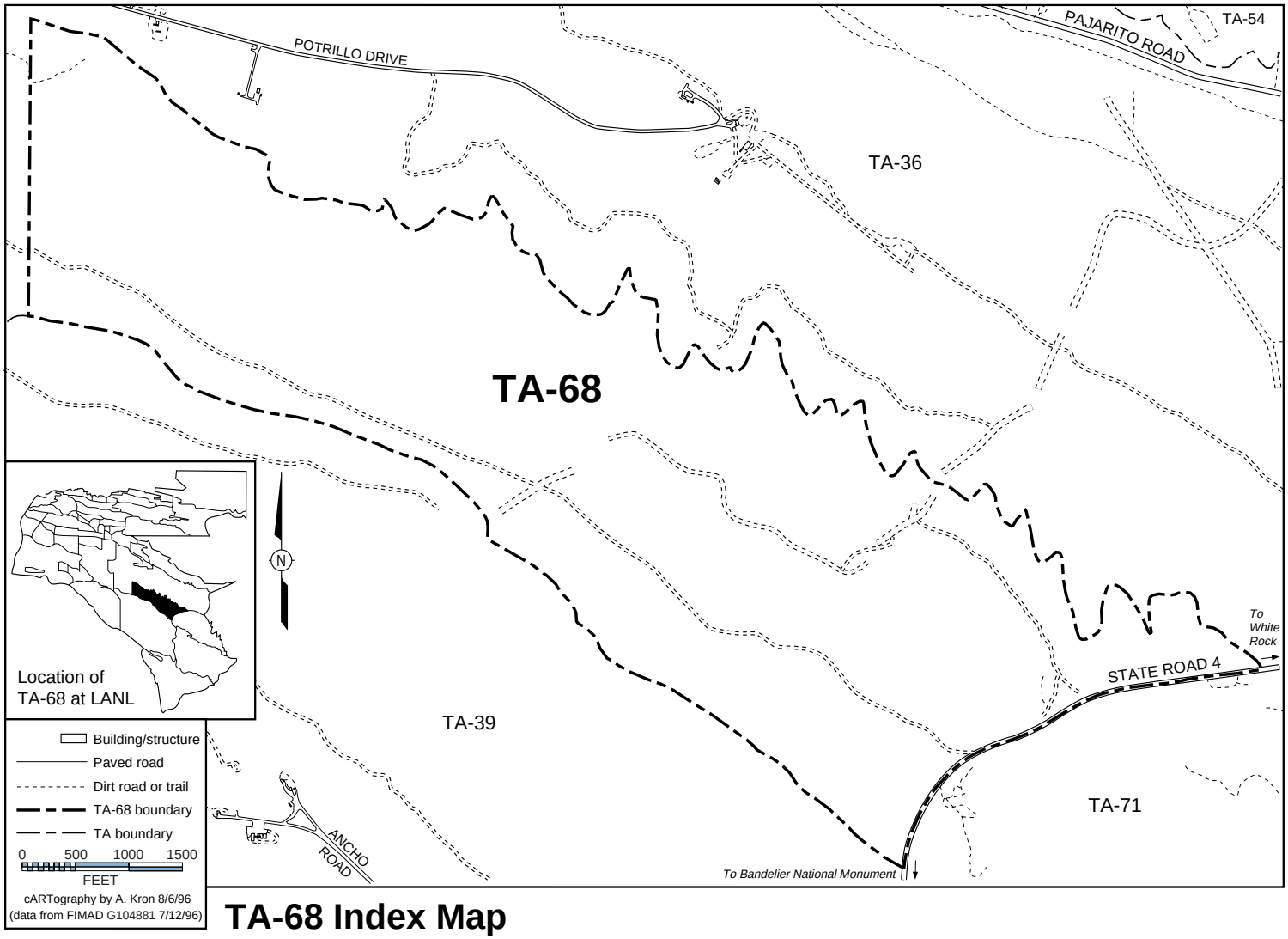


Figure 4-43. Map of TA-68, Water Canyon Site—Index Map.

4.44 TA-69, Anchor North Site

4.44.1 Site Description

TA-69, Anchor North Site [Figure 4-44 (index map of TA-69)], is located at the entrance to TAs-6, -8, -9 ,-22, and -58 and serves as an environmental buffer for the dynamic testing area.

4.44.2 Facilities Description

4.44.2.1 Facility Hazard Categories

4.44.2.1.1 Nuclear Facility Hazard Categories

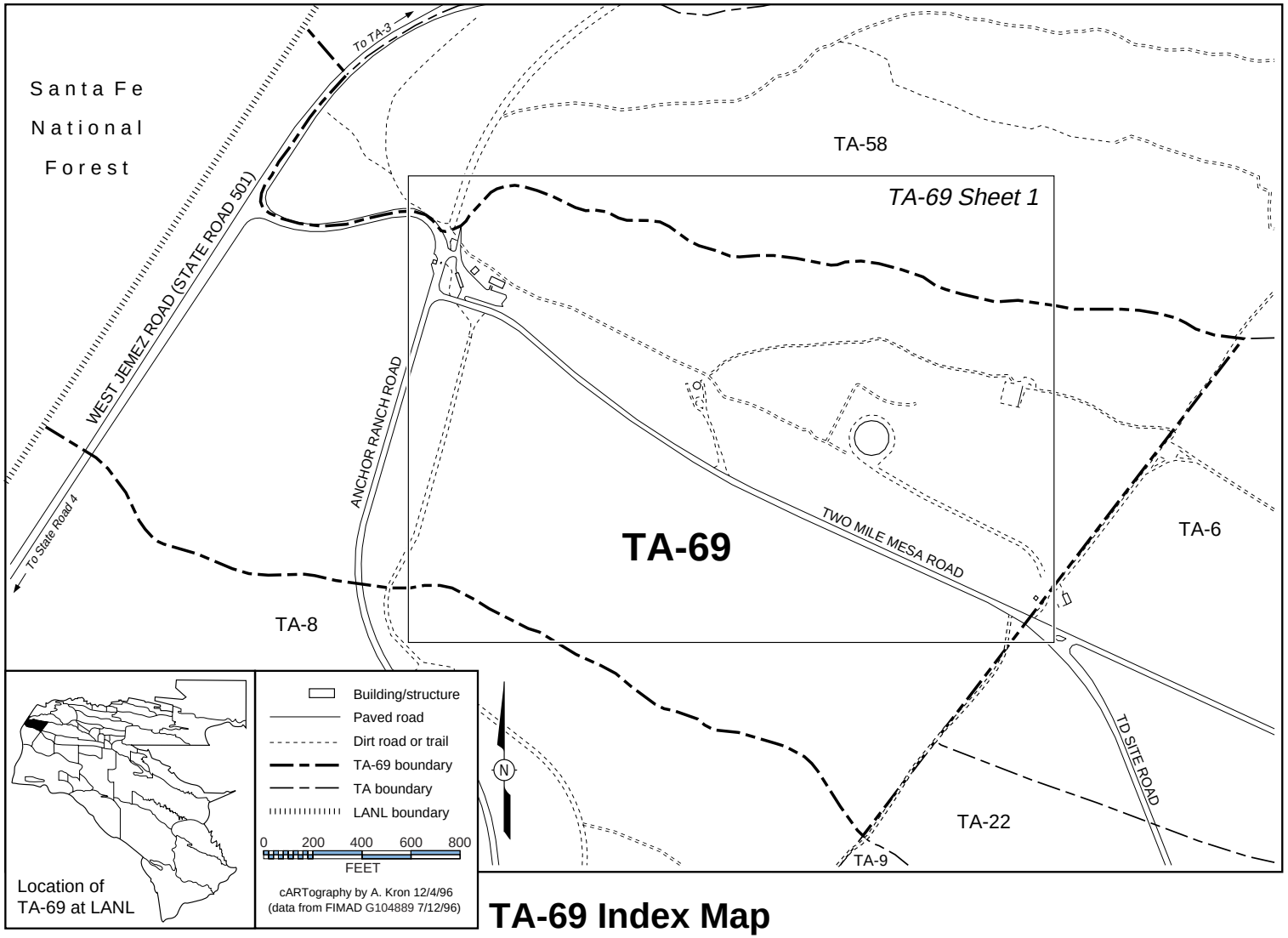
No buildings at TA-69 are categorized as nuclear facilities.

4.44.2.1.2 Non-Nuclear Facility Hazard Categories

No buildings at TA-69 are categorized as non-nuclear facilities.

4.44.2.2 Nonhazardous Facilities

Eight buildings and structures (Figure 4-44, Sheet 1) are located at this site. These buildings provide physical support and are categorized as nonhazardous.



TA-69 Index Map

Figure 4-44. Map of TA-69, Anchor North Site—Index Map.

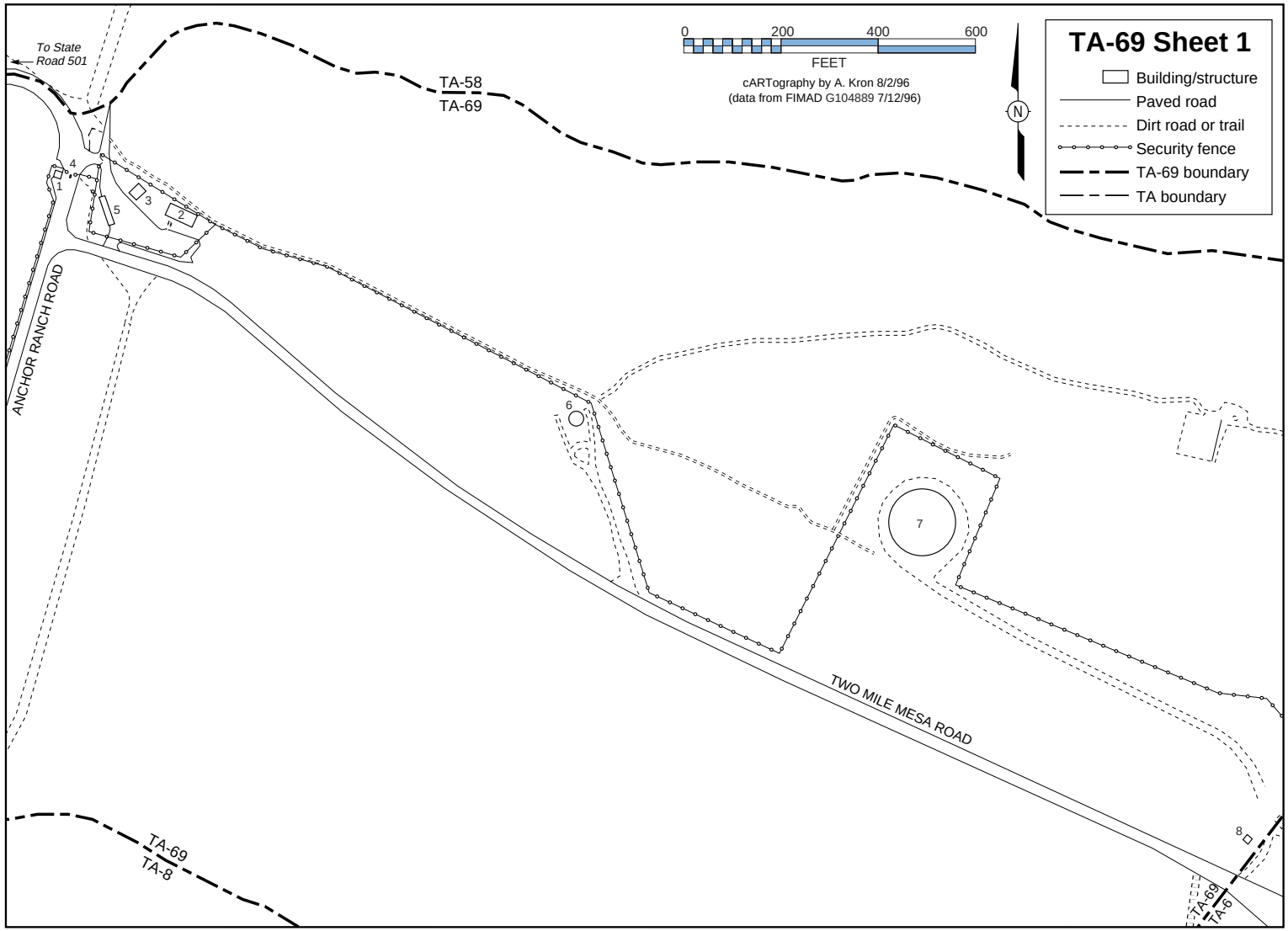


Figure 4-44. Map of TA-69, Anchor North Site—Sheet 1.

4.45 TA-70, Rio Grande Site

4.45.1 Site Description

TA-70, the Rio Grande Site [Figure 4-45 (index map of TA-70)], is an undeveloped technical area that serves as an environmental buffer zone for the high-explosives test area. Adjacent technical areas include TA-33 and TA-39 to the west and the community of White Rock to the east. No facilities are located at this site, no operations have been conducted in the past, and no future operations are currently planned.

4.45.2 Facilities Description

Because there are no structures at TA-68, discussion in this section is omitted.

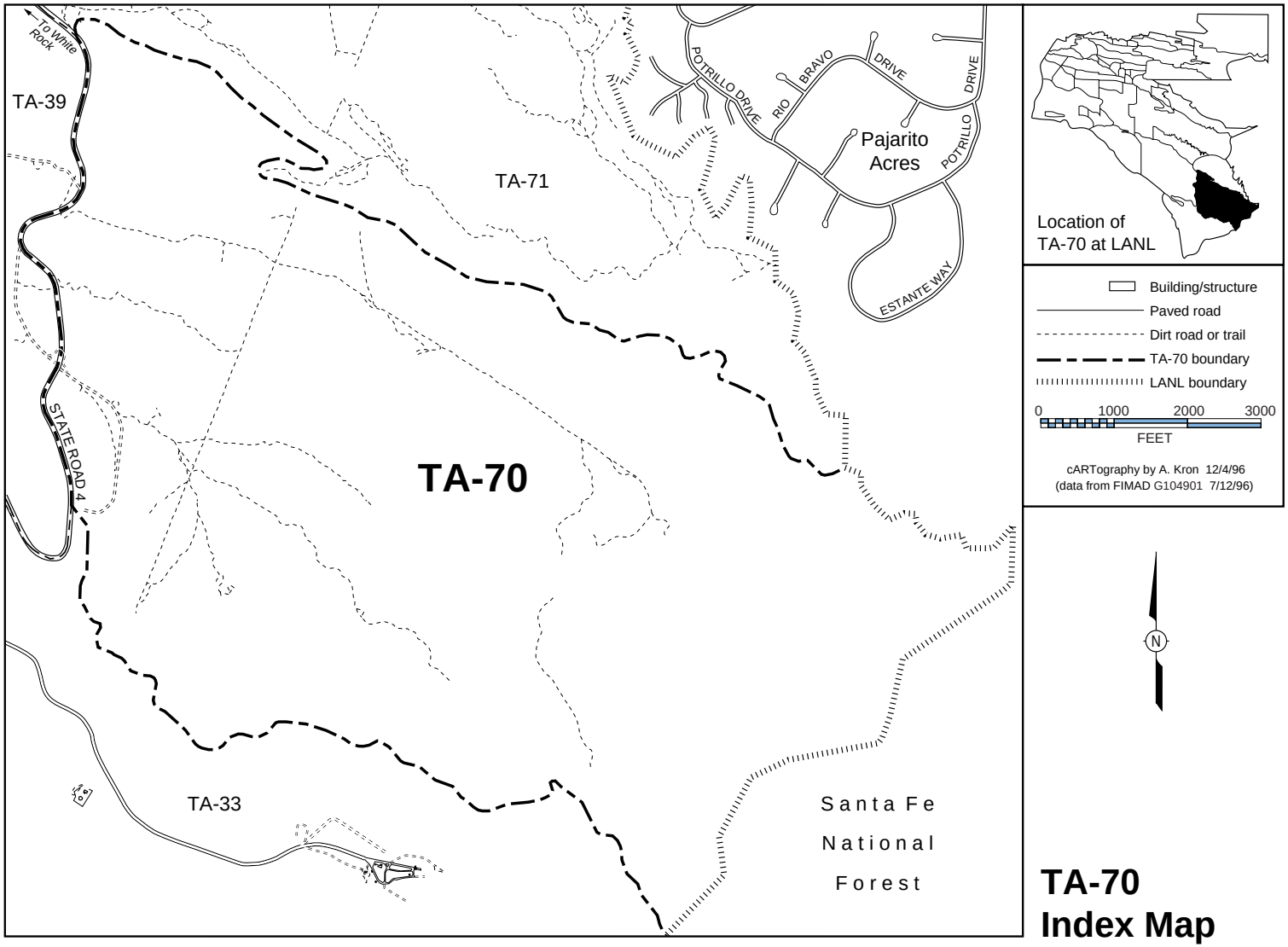


Figure 4-45. Map of TA-70, Rio Grande Site—Index Map.

4.46 TA-71, Southeast Site

4.46.1 Site Description

TA-71, Southeast Site [(Figure 4-46 (index map of TA-71)], is an undeveloped technical area located along the southeastern boundary of the Laboratory near White Rock. It serves as an environmental buffer for the high-explosives test area. There are no structures at TA-71.

4.46.2 Facilities Description

Because there are no structures at TA-68, discussion in this section is omitted.

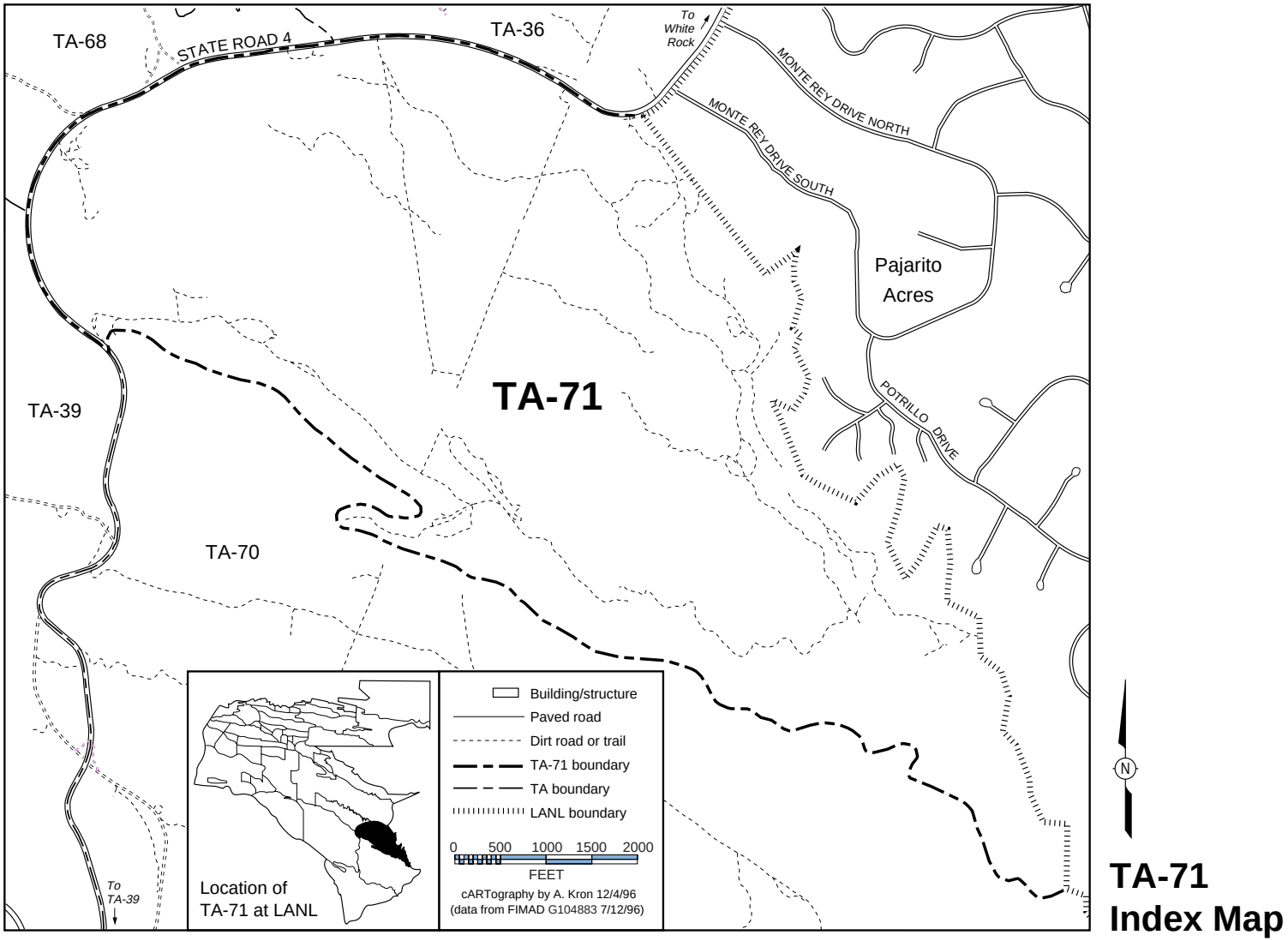


Figure 4-46. Map of TA-71, Southeast Site—Index Map.

4.47 TA-72, East Entry Site

4.47.1 Site Description

TA-72, also known as the Target Range [Table 4-29 and Figure 4-47 (index map of TA-72)], is located on the north side of East Jemez Road. TA-72 is the site of the Laboratory's Live Firing Range. Protective force personnel use the site for required training.

4.47.2 Facilities Description

The Live Firing Range comprises an administrative/training area; a skeet range; Ranges 1, 2, 3, and 4; a tower; bullet impact berms; and a storage magazine. Safety and protection systems in place at the firing range include range orientation, bullet impact berms, filled-cinder-block safety walls, bullet-retardant canopies and baffles, limit-of-fire markers, flashing warning lights when live firing is in progress, and a communication system for coordinating firing times and target changing on the ranges.

4.47.2.1 Facility Hazard Categories

Table 4-29 identifies the facilities at TA-72 that fall into a facility hazard category because of the type of operations performed in the facility.

4.47.2.1.1 Nuclear Facility Hazard Categories

No buildings at TA-72 are categorized as nuclear facilities.

4.47.2.1.2 Non-Nuclear Facility Hazard Categories

4.47.2.1.2.1 Building Categorized M/CHEM

Building 3, a well chlorination station (Figure 4-47, Sheet 2), is categorized as M/CHEM because of the presence of chlorine gas.

4.47.2.1.2.2 Buildings Categorized L/ENS

Two areas of the firing range, Pistol Range 3 and Rifle Range 4 (Figure 4-47, Sheet 1), are categorized L/ENS because of the presence and firing of small arms ammunition. Firing Range 3, the pistol range, is used to conduct DOE handgun qualification courses and M-16 and submachine gun qualifications. The primary purpose of Rifle Range 4 is training in the use of M-16 and M-60 machine guns. These two buildings are categorized L/ENS because of the presence of activation products.

4.47.2.2 Nonhazardous Facilities

The administrative and training area includes the Administrative/Training Building (Building 39), which houses offices and a classroom, and two small storage and target maintenance buildings (Buildings 13 and 14). No ammunition is stored in this area. The Skeet Range (Buildings 15 and 16) consists of two cinder block target houses connected by an asphalt walkway. This range has been inactive since 1991. The training tower (Building 41) houses the observation and control room, a target storage and maintenance room, a training room, and a rappelling platform. Bullet impact berms are located at the rear of each range except the skeet range. Their purpose is to capture projectiles after they have passed through the target area to ensure a minimum ricochet hazard and effective containment of lead in spent projectiles. A sandbagged, aboveground am-

munition storage magazine is located southwest of Building 13, which is used to store limited quantities of ammunition to support training operations at the Live Firing Range.

Firing Ranges 1 and 2 are used for training the Special Response Team and ground-level target training and practice. A wood frame canopy at the rear of Range 2 covers a bench used for weapons cleaning.

Although these facilities are considered to be nonhazardous from the standpoint that there are no unusual hazards that the public would not encounter at a similar operation, anywhere firearms are used should be considered a potentially hazardous location. The range is behind a security fence, and access is strictly controlled, especially when the range is in use.

TABLE 4-29

FACILITIES THAT FALL INTO NUCLEAR AND NON-NUCLEAR HAZARD CATEGORIES
TA-72, EAST ENTRY SITE (FIRING RANGE)

Facility Number	Building Name	Operations Category	Nuclear Facilities Hazard Categories		Non-Nuclear Facility Hazard Categories					
			Cat. 2	Cat. 3	M/RAD	M/CHEM	L/RAD	L/ENS	L/CHEM	L/ENV
3	Well Chlorination Building	Physical Support				X				
*	Pistol Range 3	Physical Support						X		
*	Rifle Range 4	Physical Support						X		

* Facility numbers have not been assigned to the ranges. Figure 4-47, Sheet 1, shows Ranges 3 and 4.

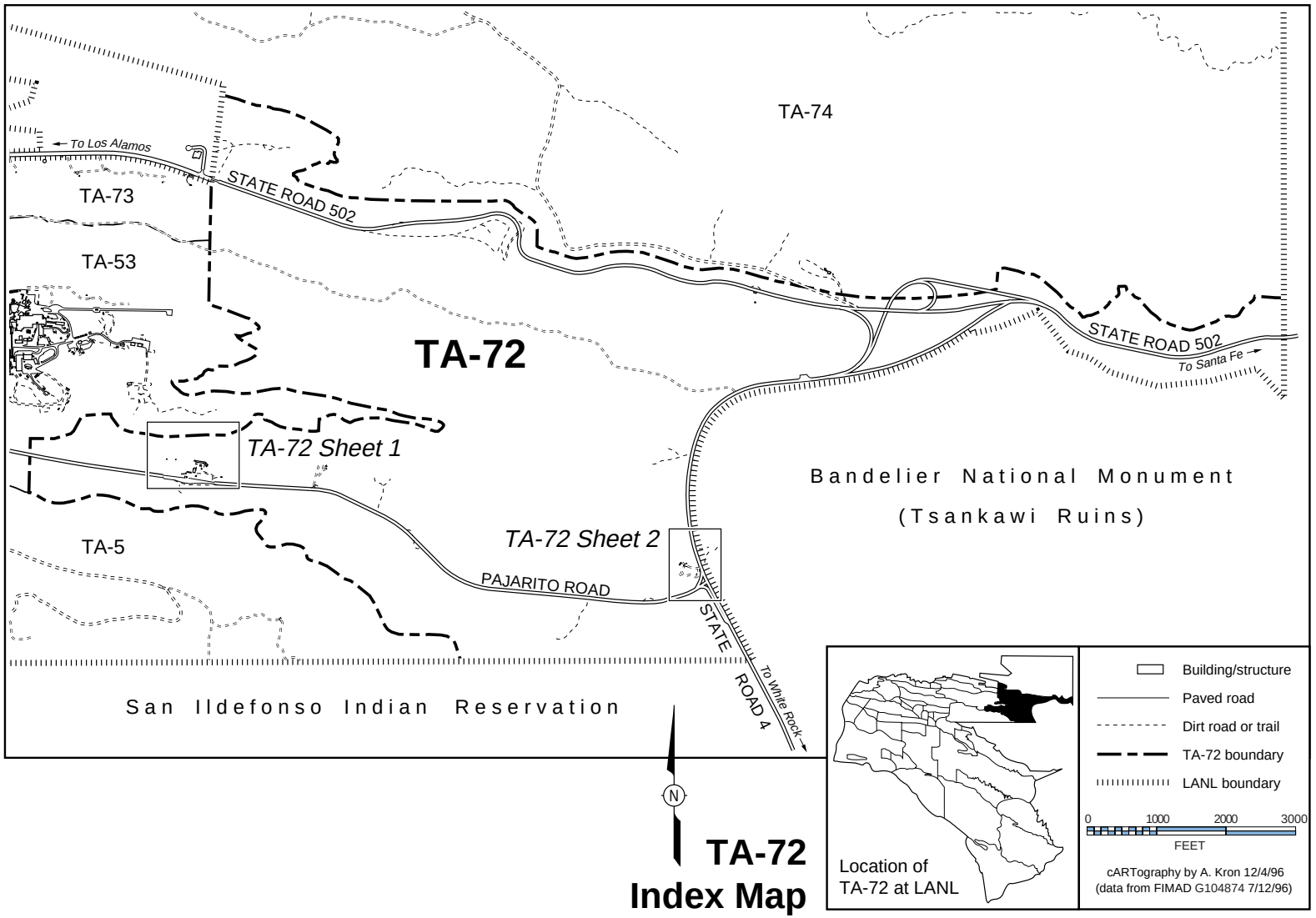


Figure 4-47. Map of TA-72, East Entry Site, Firing Range—Index Map.

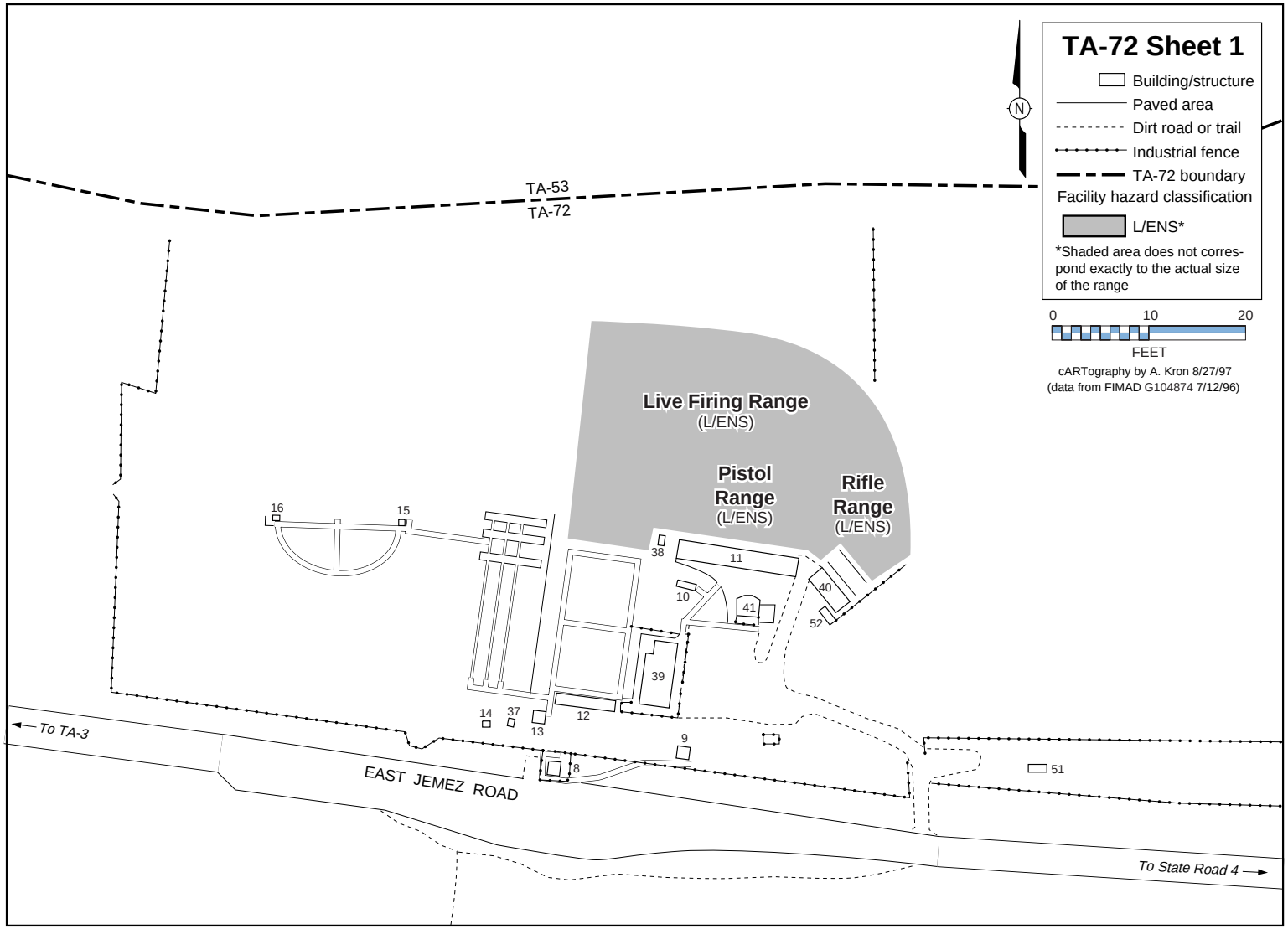


Figure 4-47. Map of TA-72, East Entry Site, Firing Range—Sheet 1.

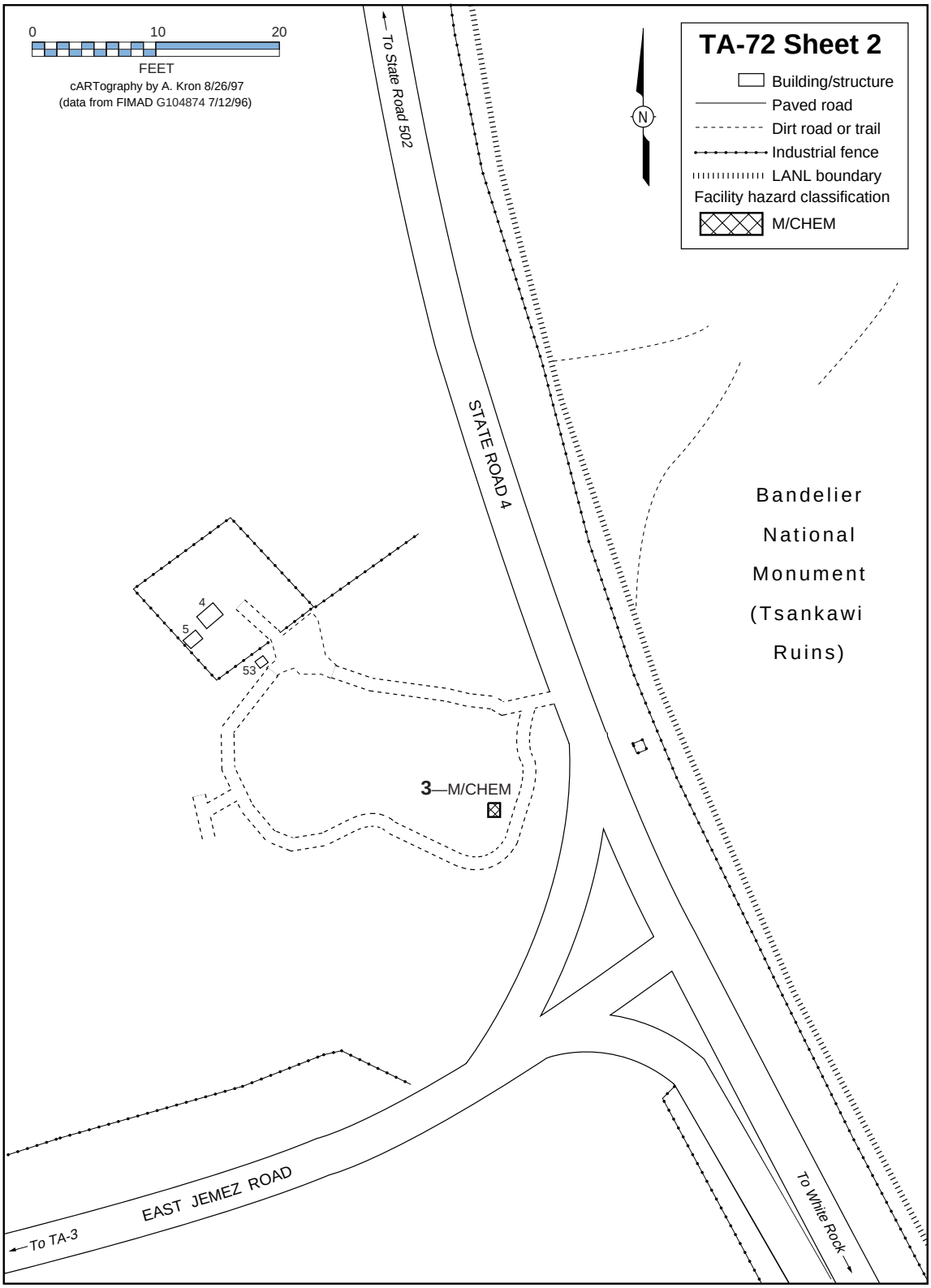


Figure 4-47. Map of TA-72, East Entry Site, Firing Range—Sheet 2.

4.48 TA-73, Airport Site

4.48.1 Site Description

TA-73 [Table 4-30 and Figure 4-48 (index map of TA-73)], the Los Alamos Airport, consists of 83.2 acres (33.7 ha) along the northern boundary of the Laboratory adjacent to Highway 502 (East Road). DOE owns the airport, and the County of Los Alamos manages, operates, and maintains it under a leasing arrangement with the DOE. Use of the airport by private individuals is permitted with special restrictions. The airport is required to comply with Federal Aviation Administration requirements governing security, airspace, and aircraft safety. TA-73 also includes DOE-controlled land that is not part of the airport.

4.48.2 Facilities Description

The airport (Figure 4-48, Sheet 1) has a single runway and several partial parallel taxiways, connectors, and parking aprons. There are 72 aircraft parking positions, including T-hangars, one two-aircraft hangar, aprons, and tie-down positions. A one-story terminal building contains offices, a service counter, dispatch area, car rental counter, and a waiting area. Other structures include a government storage building not associated with the airport and a fuel pump and storage tank owned by a pilots' cooperative. All aviation-related buildings and aircraft storage hangars are located on the north side of the airport. Building 4 is the airport fire station. Although fire protection is provided by the Los Alamos County Fire Department, the building is owned by the DOE. The rest of the TA is more or less vacant land (Figure 4-48, Sheet 2), except for some physical support facilities that are part of the Laboratory and county water system.

4.48.2.1 Facility Hazard Categories

Table 4-30 identifies the facilities at TA-73 that fall into a facility hazard category because of the type of operations performed in the facility.

4.48.2.1.1 Nuclear Facility Hazard Categories

No buildings at TA-73 are categorized as nuclear facilities.

4.48.2.1.2 Non-Nuclear Facility Hazard Categories

Building 9, a chlorination station (Figure 4-48, Sheet 2), is categorized M/CHEM. The chlorination station is part of the DOE-owned utility system and is not related to airport activities.

4.48.2.2 Nonhazardous Facilities

The rest of the facilities at TA-73 are considered nonhazardous from the standpoint of unusual hazards. Any airport is a potentially dangerous place.

TABLE 4-30

FACILITIES THAT FALL INTO NUCLEAR AND NON-NUCLEAR HAZARD CATEGORIES
TA-73, AIRPORT SITE

Facility Number	Building Name	Operations Category	Nuclear Facilities Hazard Categories		Non-Nuclear Facility Hazard Categories					
			Cat. 2	Cat. 3	M/RAD	M/CHEM	L/RAD	L/ENS	L/CHEM	L/ENV
9	Booster Station	Physical Support				X				

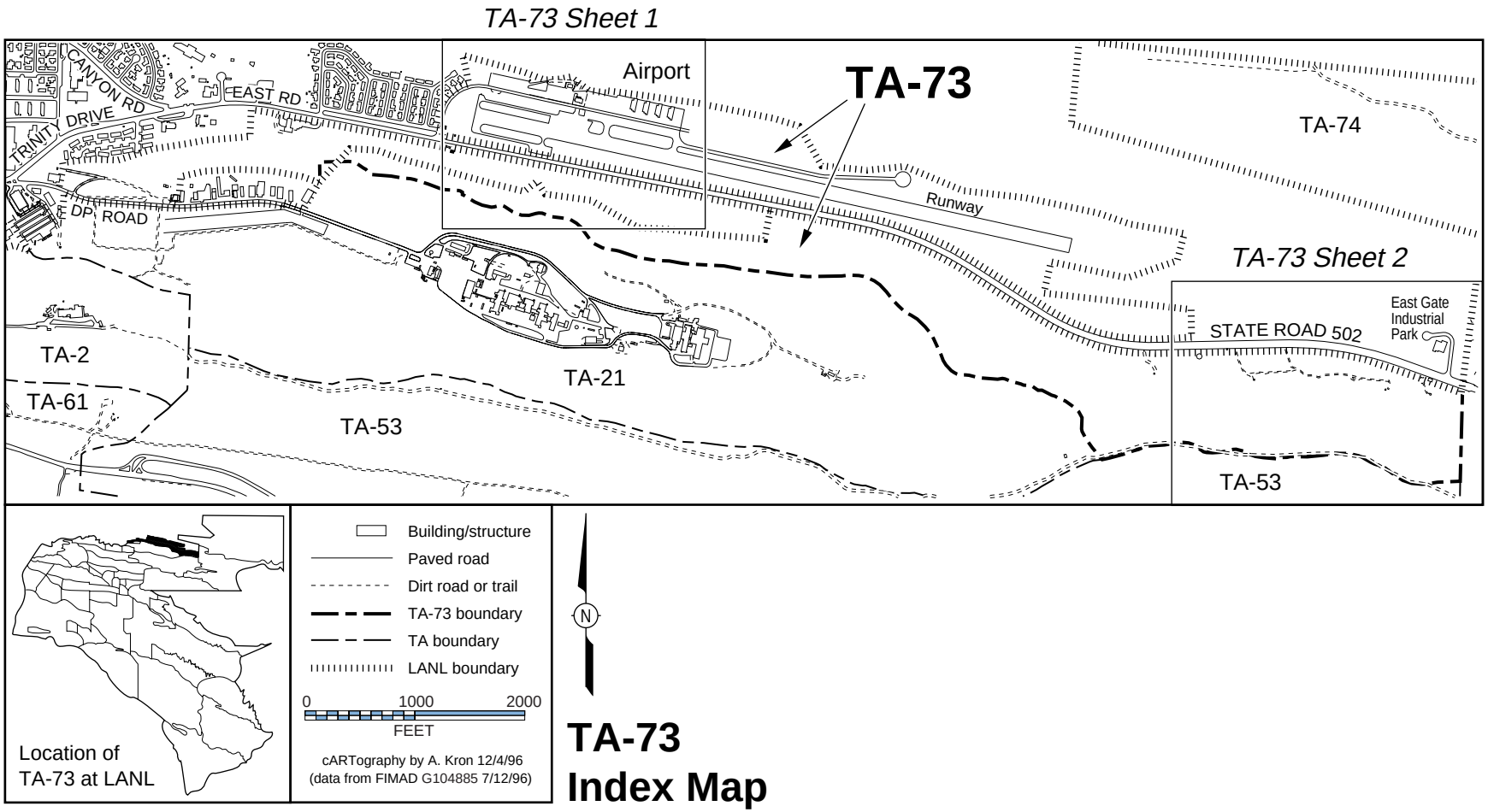


Figure 4-48. Map of TA-73, Airport Site—Index Map.

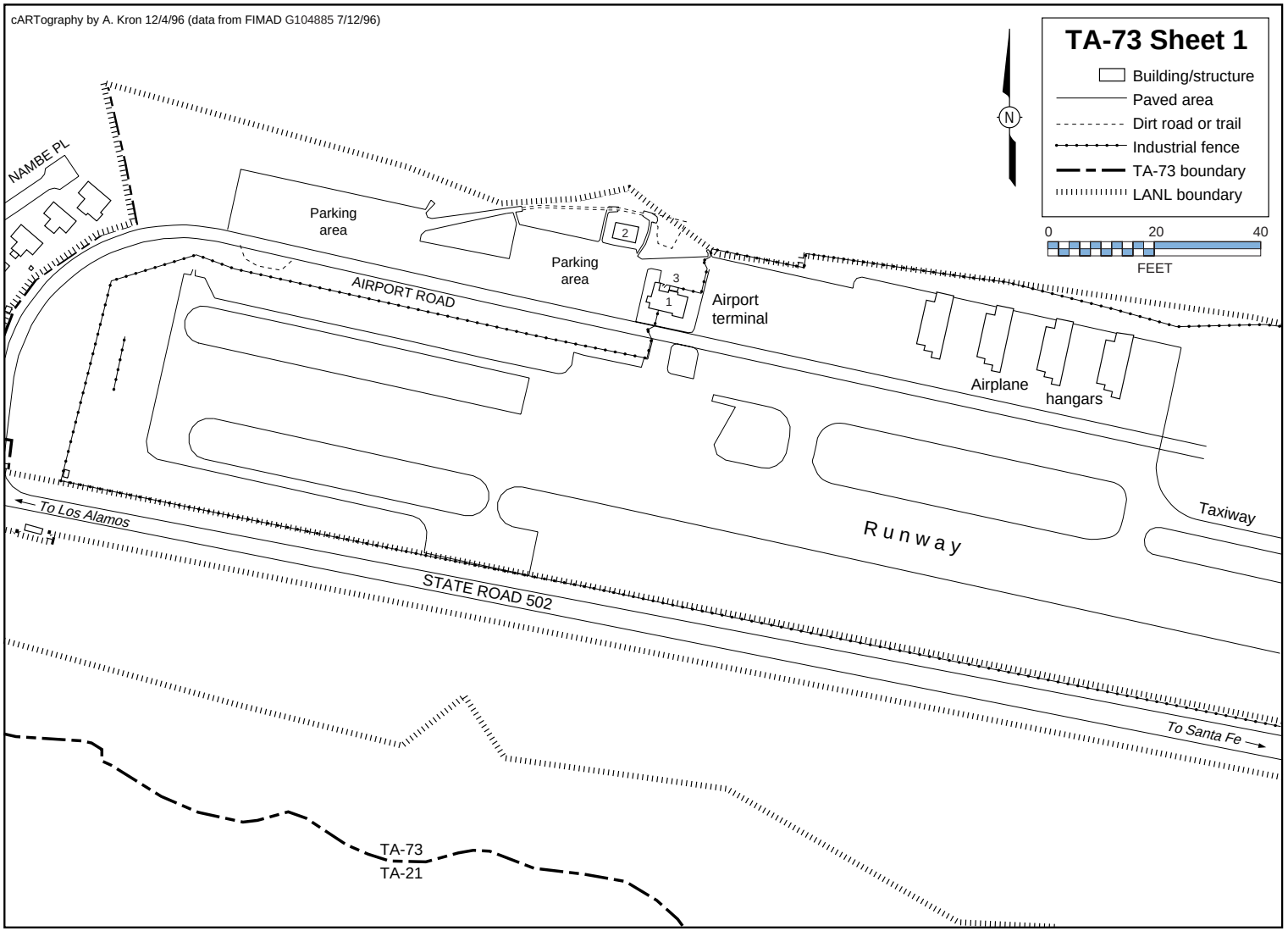


Figure 4-48. Map of TA-73, Airport Site—Sheet 1.

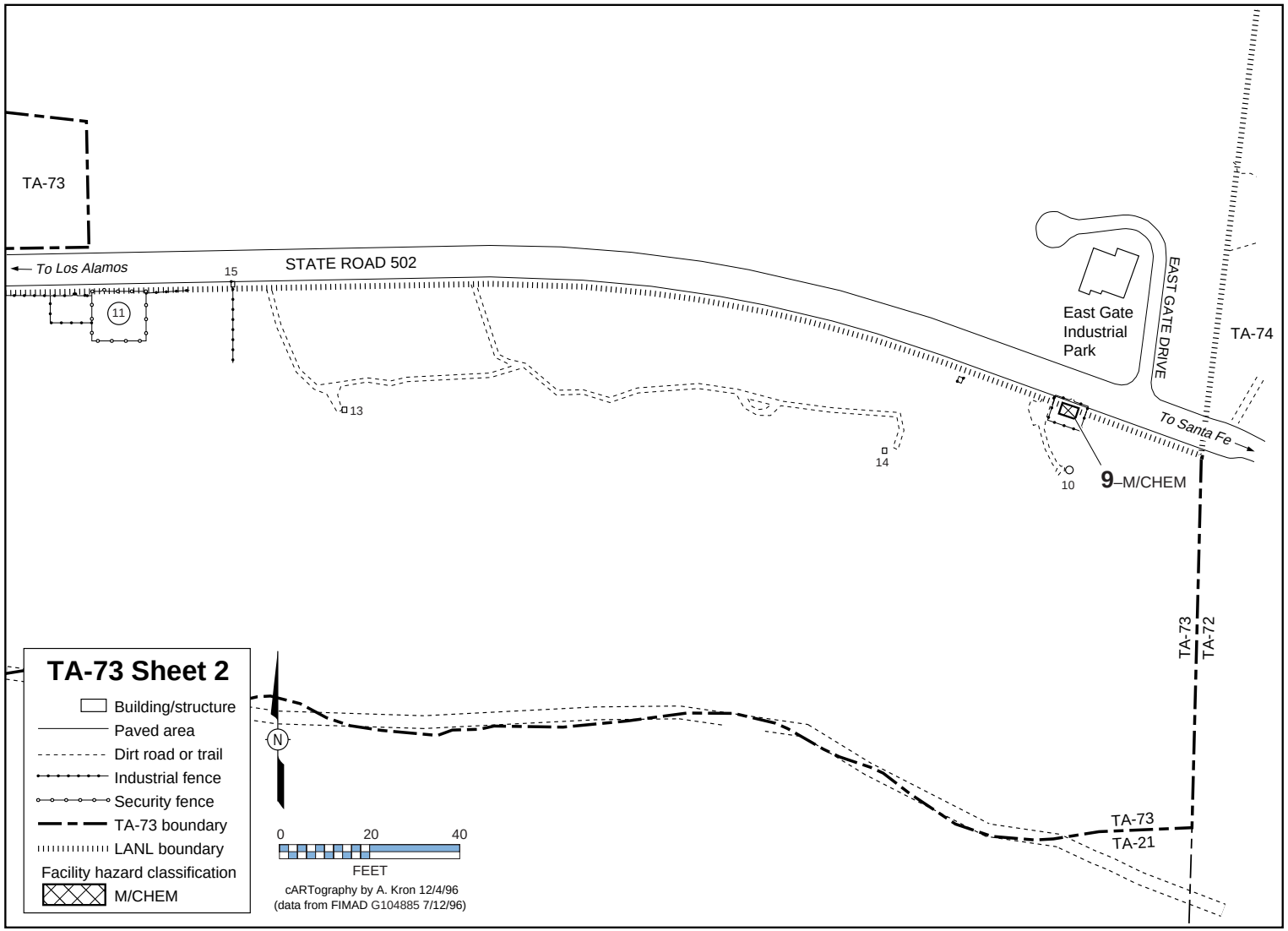


Figure 4-48. Map of TA-73, Airport Site—Sheet 2.

4.49 TA-74, Otowi Site

4.49.1 Site Description

TA-74 [Figure 4-49 (index map of TA-74)] is a large undeveloped area that borders the San Ildefonso Pueblo on the east and is isolated from most of the Laboratory. It contains a significant number of archaeological sites and an endangered species breeding area. Laboratory water wells and future well fields are also located here.

4.49.2 Facilities Description

4.49.2.1 Facility Hazard Categories

4.49.2.1.1 Nuclear Facility Hazard Categories

No buildings at TA-74 are categorized as nuclear facilities.

4.49.2.1.2 Non-Nuclear Facility Hazard Categories

No buildings at TA-74 are categorized as nuclear facilities.

4.49.2.2 Nonhazardous Facilities

The structures at TA-74 are considered to be nonhazardous.

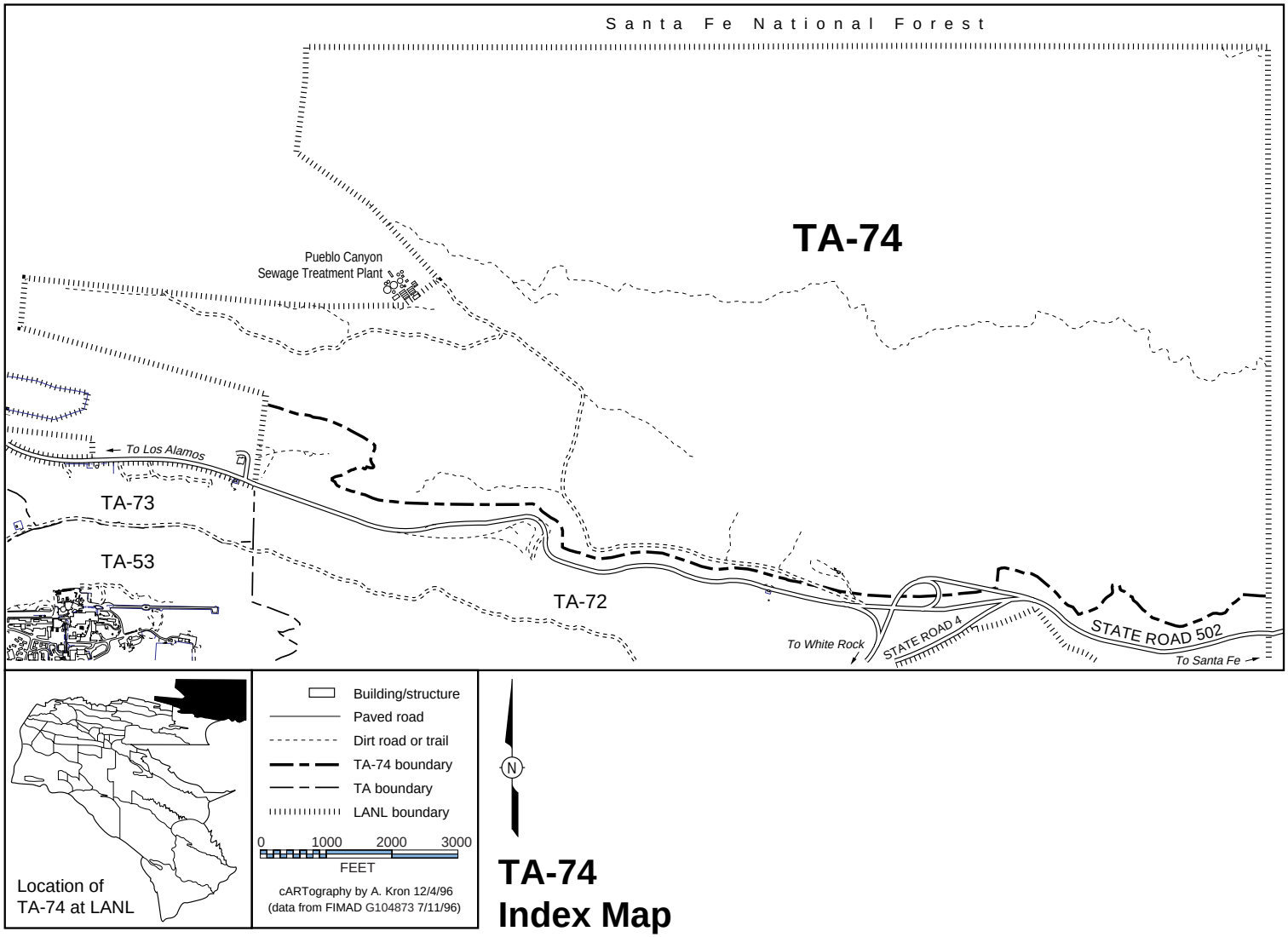


Figure 4-49. Map of TA-74, Otowi Site—Index Map.

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ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
CAI	Controlled-air incinerator
CHEM	(Hazardous) chemical source
CMR	Chemistry and Metallurgy Research (Facility)
DARHT	Dual-Axis Radiographic Hydrodynamic Test (Facility)
D&D	Decontamination and decommissioning
DoD	Department of Defense
DOE	Department of Energy
DOT	Department of Transportation
DU	Depleted uranium
ENS	(Hazardous) energy source
ENV	(Hazardous) environmental source
ESH	Environment, Safety, and Health (Division)
ES&H	Environment, safety, and health
FSS	Facilities, Security, and Safeguards (Division)
H	High
HE	High explosives
HEPA	High-efficiency particulate air (filter)
HR	Human Resources (Division)
HRL	Health Research Laboratory
HVAC	Heating, ventilation, and air conditioning
JCINNM	Johnson Controls, Inc., of Northern New Mexico
L	Low
LACEF	Los Alamos Critical Experiments Facility
LANL	Los Alamos National Laboratory
LANSCE	Los Alamos Neutron Science Center
L/CHEM	Low-level chemical (hazard category)
LEDA	Low-energy-demonstration accelerator
L/ENS	Low-level energy source (hazard category)
L/ENV	Low-level environmental (hazard category)
LLW	Low-level waste
LPSS	Long-pulse spallation source
L/RAD	Low-level radioactive (hazard category)
M	Moderate
M/CHEM	Moderate-level chemical (hazard category)
M/RAD	Moderate-level radioactive (hazard category)
MSL	Material Sciences Laboratory
NASA	National Aeronautics and Space Administration
NDA	Nondestructive assay
NHMFL	National High-Magnetic-Field Laboratory
NMED	New Mexico Environment Department
OSR	Operational safety guide
PCB	Polychlorinated biphenyl
PHERMEX	Pulsed High-Energy Radiographic Machine Emitting X-Rays
PIXY	Pulsed intense x-ray
RAMROD	Radioactive materials research, operations, and demonstration
RANT	Radioassay and nondestructive testing
R&D	Research and development
REACT	Research and Education Automatically Controlled Telescope
RLWTF	Radioactive Liquid Waste Treatment Facility

ROTSE	Robotic Optical Transient Search Experiment
SNM	Special nuclear material
STD	Standard
TA	Technical area
TFF	Target Fabrication Facility
TGCS	Tritium gas cleanup system
TGHS	Tritium-gas-handling system
TRU	Transuranic waste
TSFF	Tritium Science and Fabrication Facility
TSTA	Tritium systems test assembly
TWISP	TRU Waste Inspectable Storage Project
WCRRF	Waste Characterization, Reduction, and Repackaging Facility
WETF	Weapons Engineering Tritium Facility
WIPP	Waste Isolation Pilot Plant
WM	Waste management
WNR	Weapons neutron research