

Chapter 15: Development of Residential Areas Around Los Alamos

For a radionuclide or chemical that was used at Los Alamos to have posed a health hazard to members of the public, each of the following elements must have existed:

- A **contaminant source** that released the material into the environment,
- A **transport medium** that carried the contaminant off site to a location where exposure took place (the most common media being air and water), and
- An **exposure route** through which the contaminant entered an individual's body to produce adverse health effects. Examples of exposure routes include inhalation, ingestion, and immersion in airborne contamination.

Evaluation of off-site exposures from activities at Los Alamos technical areas will require documentation of the development of nearby residential areas over time. While it was initially thought that the 31 houses commandeered from the Los Alamos Ranch School and Anchor Ranch would provide sufficient housing for the projected staff of 30 scientists and their families (Martin 2000), it soon became clear that the scope of the challenge to provide housing for Los Alamos residents had been severely underestimated. The scarcity of housing in Los Alamos was problematic during World War II and for years to follow. Hiring at the Lab was at times severely restricted because there was nowhere for new employees to live. This pressure to provide housing and the limited availability of suitable land in the region of finger-like mesas and canyons led to the development of housing that in some cases was much closer to operational areas than has become customary for government facilities that undertake processing of nuclear materials and high explosives and/or operation of devices such as reactors or high-energy particle accelerators.

Development of Housing Areas in Los Alamos

In response to the atomic weapons race of WWII, Los Alamos, New Mexico, home of the Los Alamos Ranch School, was chosen as the location of key Manhattan Project operations in 1943. Initially, the 54 buildings of the private school for boys (27 of which were houses) were thought to be satisfactory to house the projected staff of scientist and their families (Hunner 2004; Martin 2000). Soon after the project began, the need for further housing was inevitable, and construction of the Sundt apartments began to the west and north of the Ranch School buildings (Martin 2000). The population of Los Alamos continued to grow during 1944 and 1945, and in response, several temporary housing developments were erected in the vicinity of the original town site.

The LAHDRA Project Reference Map provided with this report shows the different residential areas of Los Alamos and depicts the periods of their development, the periods they remained in use, and allows one to see the proximity of the different housing areas to operational areas of potential interest. The original Technical Area (TA-1) and wartime and early postwar housing in Los Alamos are shown in Figure 15-1, which is also included as an inset map in the Project Reference Map.

With the success of the Trinity Test in July 1945 and the ultimate ending of WWII in the September that followed, the original mission of the Manhattan Project was accomplished (Martin 2000). Many scientist and their families, unsure of the future of Los Alamos, returned to pre-war careers and lives in different locations. In 1946 over 1,000 residents left the town of Los Alamos (Hunner 2004). The temporary housing constructed during the war was deteriorating, and, in 1946, the laboratory began developing the first permanent housing in the Western Area of Los Alamos to encourage the residents to remain in the town (Martin 2000; Hunner 2004). After realizing that the Los Alamos Laboratory was going to be a permanent location for research, turnover slowed and hiring increased (LASL 1956). Expansion of the Western Area and town site continued through the late 1940s in response to overcrowding. The population in Los Alamos grew from approximately 7,000 people in 1947 to over 8,500 people in 1949 (Hunner 2004). The main areas of residential development in Los Alamos from 1946 through 2000 are shown in Fig. 15-2.

As a result of President Truman's decision to further research on the creation of the hydrogen bomb in 1949, significant amounts of money flowed into Los Alamos to support new laboratory research and handle the arrival of new personnel (Hunner 2004). The population grew from slightly over 8,500 in 1949 to 12,800 by 1952 (Hunner 2004). Residential areas began to expand northward into the North Community, and expansion continued into the early 1950s. Temporary housing constructed during the war years began to be replaced with permanent housing in the mid 1950s (LASL 1956; Martin 2000). The Los Alamos laboratory facilities began to be moved from the Ashley Pond area to the South Mesa. To support the necessary construction crews and their families, in 1949, White Rock construction camp was erected on a level plain near the rim of White Rock Canyon and Totavi trailer camp was erected on San Ildefonso Pueblo land to the east of Los Alamos along New Mexico Highway 502 (Martin 1998, 2000; Hunner 2004). Both camps were short-lived, however, White Rock nearly closing by 1953 and entirely shutting down in 1957 and Totavi shutting down in 1953 (Martin 1998, 2000).

The government maintained ownership of all property in Los Alamos until 1958, when Barranca Mesa was opened for private ownership on the mesa north of Bayo Canyon (Martin 2000). Development continued on Barranca Mesa through the mid-1960s and continued growth forced expansion onto the

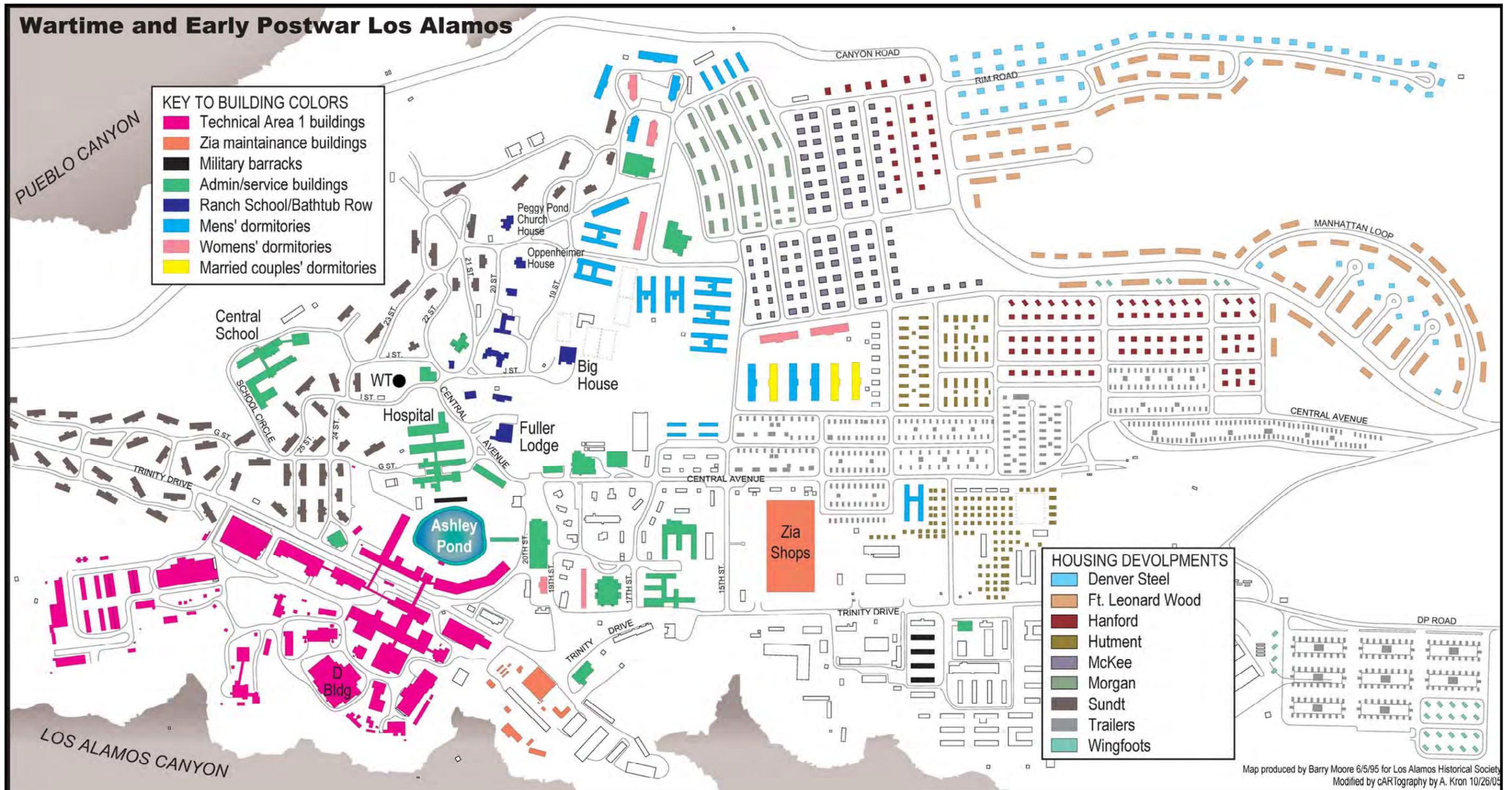
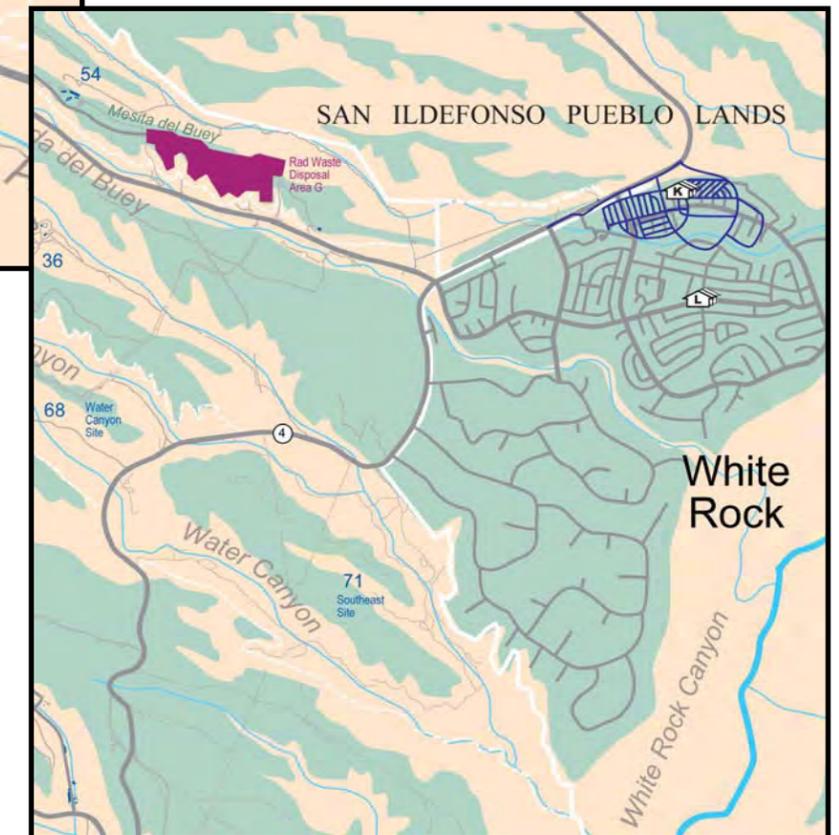


Figure 15-1: The original Los Alamos Technical Area (lower left corner) and wartime and early postwar housing



NAME OF AREA	PERIOD OF CONSTRUCTION
LOS ALAMOS	
A Western Area & nearby housing	Built 1946 through late 1940s
B North Community	Construction began 1948, expanded through early 1950s
C Replacement Housing	Built 1953-1957
D Part of "Group 18" Housing	Built 1957-1958
E Barranca Mesa Community	Land opened in 1958, expanded through 1964
F Royal Crest Trailer Park	Work began mid-1960, occupied later that year; remains in use
G North Mesa Community	Construction began in 1977, continued a few years
H Expansion onto Otowi Mesa	Construction in Late 1970s into early 1980s
I Ponderosa Estates	Constructed mid-1990s
J Quemazon Community	First occupied in 2000
WHITE ROCK	
K White Rock Construction Camp	Established in 1949, shut down in 1957
L White Rock Community	Construction began in 1962

Figure 15-2: Main residential areas of Los Alamos
[mesa-top areas (above) and White Rock area (right)]

Detail of the area in the rectangle shown above around the center of Los Alamos townsite is shown in Figure 1 for the wartime and early postwar period.

Maps are from the LAHDRA Project Reference Map produced by cARTography by Andrea Kron. Data source: LANL GISLab.

narrow neck of the mesa in the late 1970s and early 1980s (Martin 2000). The area of White Rock reopened to house low-income families in 1962, and growth continued throughout the 1960s and 1970s (Marin 2000). To accommodate the seemingly continuous shortage of housing, construction on the North Mesa began for both subdivisions and mobile home parks in 1977 (Martin 2000).

Following several years of rapid development, Los Alamos experienced relatively slow growth throughout the 1980s (Martin 2000). New construction returned in the mid-1990s with the development of Ponderosa Estates near the Guaje Pines Cemetery in the northern part of the town. In 2000, the devastating Cerro Grande Fire destroyed over 400 homes in the Western Area and North Community (Martin 2000). Rebuilding of the burned areas continues today and new developments, such as the Quemazon Community in the northwest area of town, are being erected (Kron, personal communication).

Locations of Interest When Considering Historical Operations

Based on reviews of historical documents performed to date, the following locations are among the sites where historical operations took place that appear to warrant evaluation in terms of potential off-site releases or health effects:

- D-Building at the original technical area (TA-1)
- DP West (TA-21; with released primarily from Building 12 stacks)
- DP East (TA-21; with released primarily from Buildings 152 and 153)
- Omega Site Reactors (TA-2)
- TA-3, the current main Technical Area
- The LAMPF (now LANSCE) accelerator complex
- High explosives manufacturing areas (example used is S-Site, TA-16)
- High Explosives firing sites (example used is R-Site, TA-15)
- Bayo Canyon firing site (TA-10, site of radioactive lanthanum test shots)

For evaluation of potential health effects from historical releases, each of these locations should be evaluated with regard to its relationship to Los Alamos housing areas and public facilities that were occupied during time periods that correspond to periods when operations of interest were also active. Philomena's restaurant, which began operating in the late 1970s, has been an area of interest due to its proximity to the LAMPF (now LANSCE) facility. Although not a Los Alamos housing area, San Ildefonso Pueblo land is also considered due to its close proximity to LANL operations. The housing areas and public facilities that will be most important for a given location of operations depend on a number of factors, including:

- The distance from the contaminant source to the housing area,
- The direction from the contaminant source to the housing area, and
- The prevalence of winds from the contaminant source towards the housing area.

Detailed dose assessment typically utilizes air dispersion modeling based on actual locations of release points and potentially exposed people, using meteorological data that reflect any diurnal or seasonal variations in air flow patterns. As preliminary indicators of residential areas that may be of concern, however, it is useful to examine distance, direction, and wind prevalence for relevant source-receptor combinations.

A 16-sector wind direction frequency distribution based on LANL measurements over a ten-year period was used to determine the prevalence of winds from release points of interest towards housing areas and public facilities. That wind frequency distribution is shown in Table 15-1. This table reflects a wide variation in wind direction when all data are included. If you look instead at data from specific times of the day, you will see that there are recognizable diurnal air flow patterns. As observed in many mountainous areas, air flow is typically up-valley during the day (as solar heating causes air to rise) and down-valley at night (as cooling air drains to lower elevations). These patterns are not seen in the general wind direction data shown in Table 15-1, but they are important to consider when evaluating releases that may have only occurred during daylight hours versus those that may have occurred around the clock.

Tables 15-2 through 15-10 summarize information that will be relevant to evaluation of the potential importance of public areas when evaluating releases from the identified locations of interest. In instances where the operational location of interest is large or had numerous release points, the distance was measured from the middle of the complex. This was necessary with the current main technical area (TA-3) and LAMPF (now LANSCE). Distance was measured in increments of 0.25 mile and always rounded down to the closer distance if a point fell between two distances. In most cases, the distance between the location of interest and the various public areas is presented as a range from the closest to the farthest possible points. Direction, however, was determined by using the public area closest to the location of interest.

Housing areas that are not relevant to operations of a particular facility, that is, they did not exist when that facility was operational, are shown in gray in Tables 2 through 10 rather than black to indicate that residential exposures were not possible.

Due to its close proximity to LANL operations, San Ildefonso Pueblo land is also considered an area of interest. The vast lands make it necessary to determine the areas of land that were historically used for residential purposes. Traditionally, Pueblo members lived near their central plaza and had fields which they tended outside of this area (ChemRisk 2006). According to a 1953 USGS map of Espanola, New Mexico, the nearest concentration of San Ildefonso Pueblo people to Los Alamos was north of the current Highway 502 and east of the Rio Grande (ChemRisk 2006).

Table 15-1. Wind direction frequency distribution based on 10 years of LANL data

Sector	Wind from	Wind towards	Percentage
1	N	S	3.4233
2	NNE	SSW	3.6218
3	NE	SW	3.3293
4	ENE	WSW	3.1224
5	E	W	3.4616
6	ESE	WNW	3.3936
7	SE	NW	3.718
8	SSE	NNW	6.0108
9	S	N	8.8439
10	SSW	NNE	8.2649
11	SW	NE	7.7308
12	WSW	ENE	8.1937
13	W	E	11.4148
14	WNW	ESE	11.9399
15	NW	SE	9.2887
16	NNW	SSE	4.2424

Table 15-2: D-Building at the Original Technical Area (operational from 1943 to 1953)

Public Area	Period Occupied	Distance from D Building (mi)	Direction from D Building	Winds in this direction (%)
Wartime Housing	1943-1945	0.1-0.75	NW	3.7
Early Postwar Housing	1946-1960s	0.25-1	NE	7.7
Western Area	1946-present	0.25-1.5	WNW	3.4
North Community	1948-present	0.75-2	NW	3.7
Replacement Housing	1953-present	0.25-0.75	NE	7.7
Group 18 Homes by Airport	1957-present	0.75-1.25	ENE	8.2
Barranca Mesa	1958-present	1.5-2.5	NNE	8.3
Royal Crest Trailer Park	1960-present	0.75	SE	9.3
North Mesa	1977-present	0.75-2.25	NNE	8.3
Otowi Mesa Expansion	late 1970s-present	2.25-3	NE	7.7
Ponderosa Estates	Mid 1990s-present	1.5-2	N	8.8
East Gate / Philomena's	Late 1970s-present	2.25	E	11.4
Totavi Camp	1949-1953	7	E	11.4
White Rock Camp	1949-1953 (1957)	6.25-7	SE	9.3
White Rock Community	1962-present	5.75-8	SE	9.3
San Ildefonso Pueblo Lands	1598-present	10.25	E	11.4

Table 15-3: DP West Site at TA-21 (operational from 1945 to 1973)

Public Area	Period Occupied	Distance from DP West (mi)	Direction from DP West	Winds in this direction (%)
Wartime Housing	1943-1945	0.75-2	WNW	3.4
Early Postwar Housing	1946-1960s	0.5-2.5	NW	3.7
Western Area	1946-present	2.25-2.75	WNW	3.4
North Community	1948-present	1.75-3.25	NW	3.7
Replacement Housing	1953-present	0.5-2.25	WNW	3.4
Group 18 Homes by Airport	1957-present	0.25-0.5	NNW	6.0
Barranca Mesa	1958-present	1.5-2.25	N	8.8
Royal Crest Trailer Park	1960-present	0.75	SW	3.3
North Mesa	1977-present	0.75-1.75	NNW	6.0
Otowi Mesa Expansion	late 1970s-present	1.5-1.75	NE	7.7
Ponderosa Estates	Mid 1990s-present	2-2.5	NNW	6.0
East Gate / Philomena's	Late 1970s-present	1.25	E	11.4
Totavi Camp	1949-1953	5.5	E	11.4
White Rock Camp	1949-1953 (1957)	5.25	SE	9.3
White Rock Community	1962-present	5-7	SE	9.3
San Ildefonso Pueblo Lands	1598-present	9	ENE	8.2

Table 15-4: DP East Site at TA-21 (operational from 1945 to 1970)

Public Area	Period Occupied	Distance from DP East (mi)	Direction from DP East	Winds in this direction (%)
Wartime Housing	1943-1945	1.25-2.25	WNW	3.4
Early Postwar Housing	1946-1960s	1-2.75	WNW	3.4
Western Area	1946-present	2.75-3.25	WNW	3.4
North Community	1948-present	2-3.75	NW	3.7
Replacement Housing	1953-present	1-2.75	WNW	3.4
Group 18 Homes by Airport	1957-present	0.5-0.75	NW	3.7
Barranca Mesa	1958-present	1.5-2.25	NNW	6.0
Royal Crest Trailer Park	1960-present	1	WSW	3.1
North Mesa	1977-present	0.75-2.25	NNW	6.0
Otowi Mesa Expansion	late 1970s-present	1.5	NNE	8.3
Ponderosa Estates	Mid 1990s-present	2.25-3	NNW	6.0
East Gate / Philomena's	Late 1970s-present	0.75	E	11.4
Totavi Camp	1949-1953	5	E	11.4
White Rock Camp	1949-1953 (1957)	5	SE	9.3
White Rock Community	1962-present	4.5-7	SE	9.3
San Ildefonso Pueblo Lands	1598-present	8.25	ENE	8.2

Table 15-5: Omega Site Reactors at TA-2 (operational from 1943 To 1992)

Public Area	Period Occupied	Distance from Omega Site (mi)	Direction from Omega Site	Winds in this direction (%)
Wartime Housing	1943-1945	0.25-1.25	WNW	3.4
Early Postwar Housing	1946-1960s	0.25-1.75	N	8.8
Western Area	1946-present	1.5-2.25	WNW	3.4
North Community	1948-present	1.25-2.25	NW	3.7
Replacement Housing	1953-present	0.25-0.75	N	8.8
Group 18 Homes by Airport	1957-present	0.5-0.75	NE	7.7
Barranca Mesa	1958-present	1.75-2.25	NNE	8.3
Royal Crest Trailer Park	1960-present	0.25	S	3.4
North Mesa	1977-present	1-1.5	N	8.8
Otowi Mesa Expansion	late 1970s-present	2-2.5	NE	7.7
Ponderosa Estates	Mid 1990s-present	1.75-2.25	NNW	6.0
East Gate / Philomena's	Late 1970s-present	1.75	E	11.4
Totavi Camp	1949-1953	6.25	E	11.4
White Rock Camp	1949-1953 (1957)	5.75	SE	9.3
White Rock Community	1962-present	5.25-7.25	SE	9.3
San Ildefonso Pueblo Lands	1598-present	8.5	ENE	8.2

Table 15-6: TA-3, the current main technical area (operational from 1953 to present)

Public Area	Period Occupied	Distance from TA-3 (mi)	Direction from TA-3	Winds in this direction (%)
Wartime Housing	1943-1945	0.75-1.75	NE	7.7
Early Postwar Housing	1946-1960s	1-2	NE	7.7
Western Area	1946-present	0.5-1	N	8.8
North Community	1948-present	1.25-2.25	N	8.8
Replacement Housing	1953-present	0.5-2	NE	7.7
Group 18 Homes by Airport	1957-present	2-2.5	ENE	8.2
Barranca Mesa	1958-present	2.25-3.5	NE	7.7
Royal Crest Trailer Park	1960-present	1.75	E	11.4
North Mesa	1977-present	1.75-3.25	NE	7.7
Otowi Mesa Expansion	late 1970s-present	3.5-4	NE	7.7
Ponderosa Estates	Mid 1990s-present	2-2.5	NNE	8.3
East Gate / Philomena's	Late 1970s-present	3.5	E	11.4
Totavi Camp	1949-1953	8	E	11.4
White Rock Camp	1949-1953 (1957)	7.25	SE	9.3
White Rock Community	1962-present	6.5-9	SE	9.3
San Ildefonso Pueblo Lands	1598-present	11.5	ENE	8.2

Note – Distance from TA-3 is measured from middle of complex

Table 15-7: LAMPF (now LANSCE, operational from 1968 to present)

Public Area	Period Occupied	Distance from LAMPF Building (mi)	Direction from LAMPF Building	Winds in this direction (%)
Wartime Housing	1943-1945	2-3	WNW	3.4
Early Postwar Housing	1946-1960s	1.75-3.5	WNW	3.4
Western Area	1946-present	3.25-4	WNW	3.4
North Community	1948-present	2.75-4.25	NW	3.7
Replacement Housing	1953-present	1.75-3.5	NW	3.7
Group 18 Homes by Airport	1957-present	1.25-1.75	NW	3.7
Barranca Mesa	1958-present	2.25-3.25	NNW	6.0
Royal Crest Trailer Park	1960-present	1.75	W	3.5
North Mesa	1977-present	1.25-3	NNW	6.0
Otowi Mesa Expansion	late 1970s-present	1.75-2.25	N	8.8
Ponderosa Estates	Mid 1990s-present	3.25-3.75	NW	3.7
East Gate / Philomena's	Late 1970s-present	0.5	NNE	8.3
Totavi Camp	1949-1953	4.5	E	11.4
White Rock Camp	1949-1953 (1957)	4	SE	9.3
White Rock Community	1962-present	3.75-6	SE	9.3
San Ildefonso Pueblo Lands	1598-present	8	ENE	8.2

Note – Distance from LANSCE building is measured from middle of complex

Table 15-8: High Explosives Manufacturing Area– S-Site (TA-16, operational 1944 to present)

Public Area	Period Occupied	Distance from S-Site (mi)	Direction from S-Site Building	Winds in this direction (%)
Wartime Housing	1943-1945	3-3.75	NNE	8.3
Early Postwar Housing	1946-1960s	3.25-3.75	NNE	8.3
Western Area	1946-present	2.75-3.25	NNE	8.3
North Community	1948-present	3.5-4.25	N	8.8
Replacement Housing	1953-present	3-3.75	NNE	8.3
Group 18 Homes by Airport	1957-present	3.75-4	NE	7.7
Barranca Mesa	1958-present	4.75-5.25	NE	7.7
Royal Crest Trailer Park	1960-present	3	NE	7.7
North Mesa	1977-present	3.75-4.75	NNE	8.3
Otowi Mesa Expansion	late 1970s-present	5.25-5.75	NE	7.7
Ponderosa Estates	Mid 1990s-present	4.25-4.75	NNE	8.3
East Gate / Philomena's	Late 1970s-present	4.75	NE	7.7
Totavi Camp	1949-1953	9.5	ENE	8.2
White Rock Camp	1949-1953 (1957)	7-7.5	ESE	11.9
White Rock Community	1962-present	6.25-8	ESE	11.9
San Ildefonso Pueblo Lands	1598-present	12.5	ENE	8.2

Table 15-9: High Explosive Firing Site – R-Site (TA-15, operational from 1944 to present)

Public Area	Period Occupied	Distance from R-Site (mi)	Direction from R-Site Building	Daytime Winds in this direction (%)
Wartime Housing	1943-1945	2.5-3	N	8.8
Early Postwar Housing	1946-1960s	2.5-3.25	NNE	8.3
Western Area	1946-present	2.5-3.5	NNW	3.4
North Community	1948-present	3.25-4.25	N	8.8
Replacement Housing	1953-present	2.5-3	NNE	8.3
Group 18 Homes by Airport	1957-present	2.75-3	NNE	8.3
Barranca Mesa	1958-present	4-4.5	NNE	8.3
Royal Crest Trailer Park	1960-present	2	NNE	8.3
North Mesa	1977-present	3.25-3.75	N	8.8
Otowi Mesa Expansion	late 1970s-present	4.25-4.5	NNE	8.3
Ponderosa Estates	Mid 1990s-present	3.75-4.25	N	8.8
East Gate / Philomena's	Late 1970s-present	3.5	NE	7.7
Totavi Camp	1949-1953	7.5	ENE	8.2
White Rock Camp	1949-1953 (1957)	5.25-6.25	ESE	11.9
White Rock Community	1962-present	4.75-6.25	ESE	11.9
San Ildefonso Pueblo Lands	1598-present	10.5	ENE	8.2

Public Area	Period Occupied	Distance from Bayo Canyon Firing Site (mi)	Direction from Bayo Canyon Firing Site	Winds in this direction (%)
Wartime Housing	1943-1945	2-3	WSW	3.1
Early Postwar Housing	1946-1960s	1.5-2.5	WSW	3.1
Western Area	1946-present	3.25-4	WSW	3.1
North Community	1948-present	2.5-4	W	3.5
Replacement Housing	1953-present	1.75-3.25	WSW	3.1
Group 18 Homes by Airport	1957-present	1.25-1.75	SW	3.3
Barranca Mesa	1958-present	0.75-2.25	NW	3.7
Royal Crest Trailer Park	1960-present	2.25	SW	3.3
North Mesa	1977-present	0.5-2.25	WSW	3.1
Otowi Mesa Expansion	late 1970s-present	0.25-0.75	N	8.8
Ponderosa Estates	Mid 1990s-present	2.5-3	WNW	3.4
East Gate / Philomena's	Late 1970s-present	1	S	3.4
Totavi Camp	1949-1953	5	ESE	11.9
White Rock Camp	1949-1953 (1957)	5.25	SSE	4.2
White Rock Community	1962-present	5-7.25	SSE	4.2
San Ildefonso Pueblo Lands	1598-present	8	E	11.4

Based on examination of the information presented in Tables 15-2 through 15-10 and information from historical documents reviewed by the LAHDRA project team, following are discussions of public areas that may be of importance for evaluation of releases from the historical operations of interest listed above:

a. D Building at TA-1

D Building at the original Technical Area was the site of plutonium processing during the war years. Specifically, D Building housed plutonium purification and recovery, conversion to metal, metallurgy, weapon component fabrication, and application of coatings. After DP West site became operational in late 1945, D Building continued to house activities that involved plutonium, including chemical and metallurgical research and analysis, until a “new D Building” was completed on South Mesa in the form of the CMR Building within Technical Area 3 (Coffinberry and Miner 1961). D Building was razed in 1953 (Ahlquist et al. 1977).

Due to D Building’s period of operation and proximity to the town site, Wartime Housing and Early Postwar Housing would be public areas of interest with regards to historical releases from D Building. Wartime housing ranged from 0.1-0.75 miles from D Building, and the closest occupants were northwest of the D-Building in the Sundt apartments. Wind blew in the northwest direction 3.7% of the time averaged over a 10 year period. Early Postwar Housing ranged from 0.25 (Hanford Houses) to 1 mile (Denver Steel and Ft. Leonard Wood Houses) to the northeast of D Building, with the wind blowing to the northeast 7.7% of the time. Figures 15-3, 15-4, and 15-5 show the original Technical Area with wartime housing in the form of Sundt apartments located nearby.

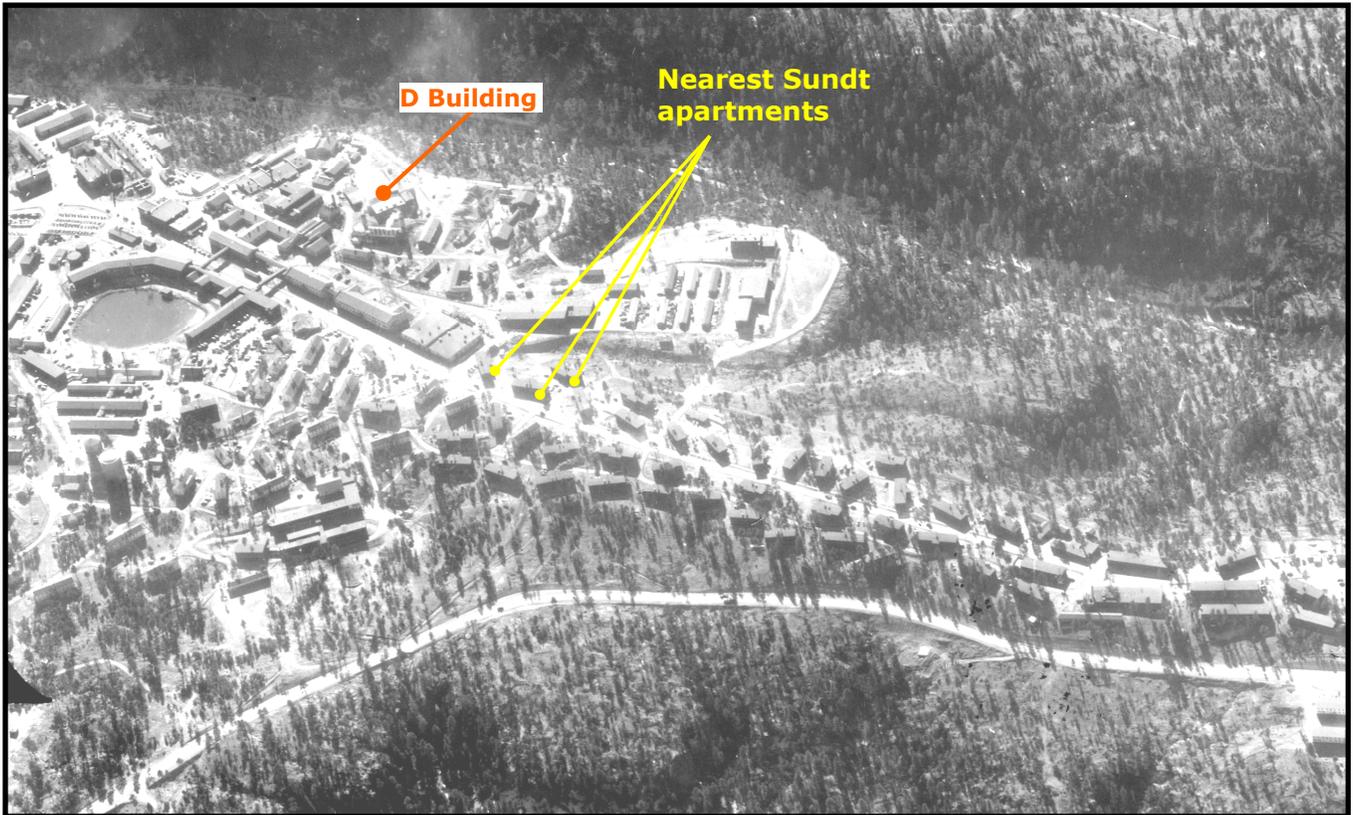


Figure 15-3: This November 1946 aerial photograph, looking south, shows Sundt apartments west (to the right) of the Technical Area, on both sides of Trinity Drive, which crosses from the upper left to the lower right of the photo. *Photo courtesy Los Alamos Historical Society (LAHM-P1990-40-1-3028).*

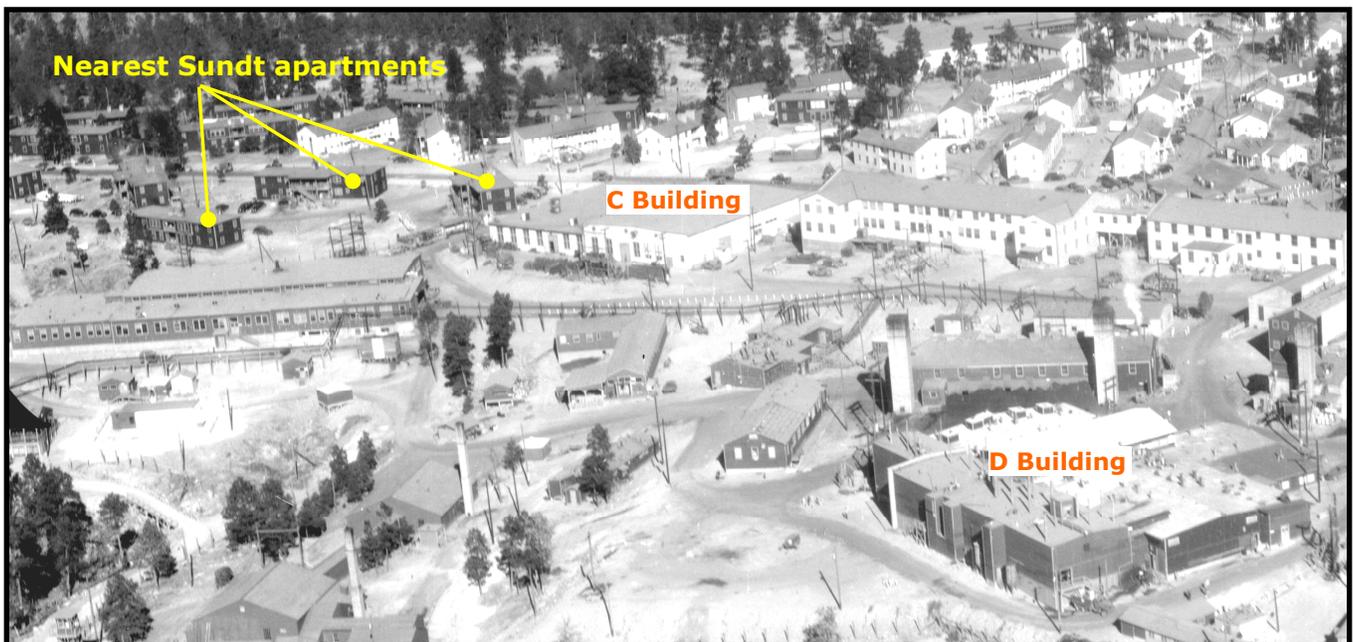


Figure 15-4: This 12/04/1946 aerial photograph, looking north, shows the Sundt apartments (dark buildings in upper left) immediately west and north of the Technical Area. The large building at the lower right is D Building. The largest white Technical Area building nearest the Sundt Apartments (photo upper center) is C Building, which housed shops and was the site of a January 1945 fire that prompted planning of replacement facilities for processing plutonium. *Photo courtesy Los Alamos Historical Society (LAHM-P1990-40-1-3029).*

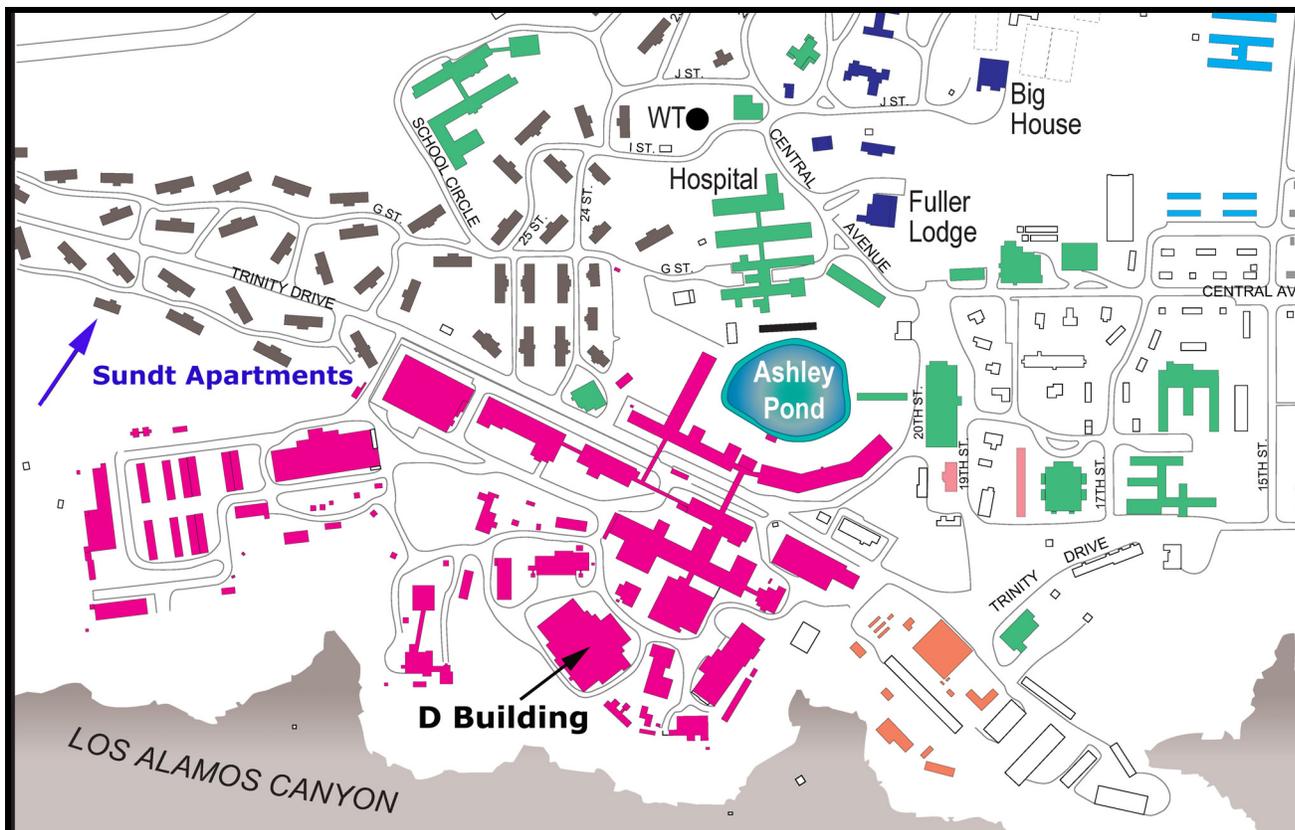


Fig. 15-5: Location of D Building within the original Technical Area relative to some Los Alamos wartime and early postwar housing. Sundt apartments are in the upper-left portion of the figure. The green buildings are administrative and service buildings, not residents. *From a map produced by Barry Moore for the Los Alamos Historical Society and modified by cARTography by Andrea Kron.*

b. DP West (TA-21; with releases from Building 12 stacks)

In response to fire hazard and safety concerns, most plutonium processing operations moved to DP West in late 1945. Building 12 was the filter building for all of the plutonium processing buildings (2, 3, 4, and 5) and continued in service until 1973. A public area of interest with regard to releases from Building 12 stacks is the Group 18 Housing west of the airport. Figures 15-6 and 15-7 show the locations of DP Site and relevant housing areas. The closest of these homes were 0.25 mi from DP West and winds blew in their direction (NNW) an average of 6.0% of the time. Other Los Alamos housing areas of interest include Early Postwar Housing such as the Denver Steel, Ft. Leonard Wood, Hanford, and Wingfoot housing developments. These areas were located 0.5 to 2.5 mi northwest of DP West, and winds blew in this direction 3.7% of the time. The trailer park south of DP Road should be considered since it was located 0.5 mi directly west from DP West, and winds blew in this direction 3.5% of the time. Finally, the Replacement Housing (see symbol C in Fig. 15-6), is an area of interest since it was constructed as close as 0.5 miles west-northwest of DP West, and wind blew in this direction 3.4% of the time.

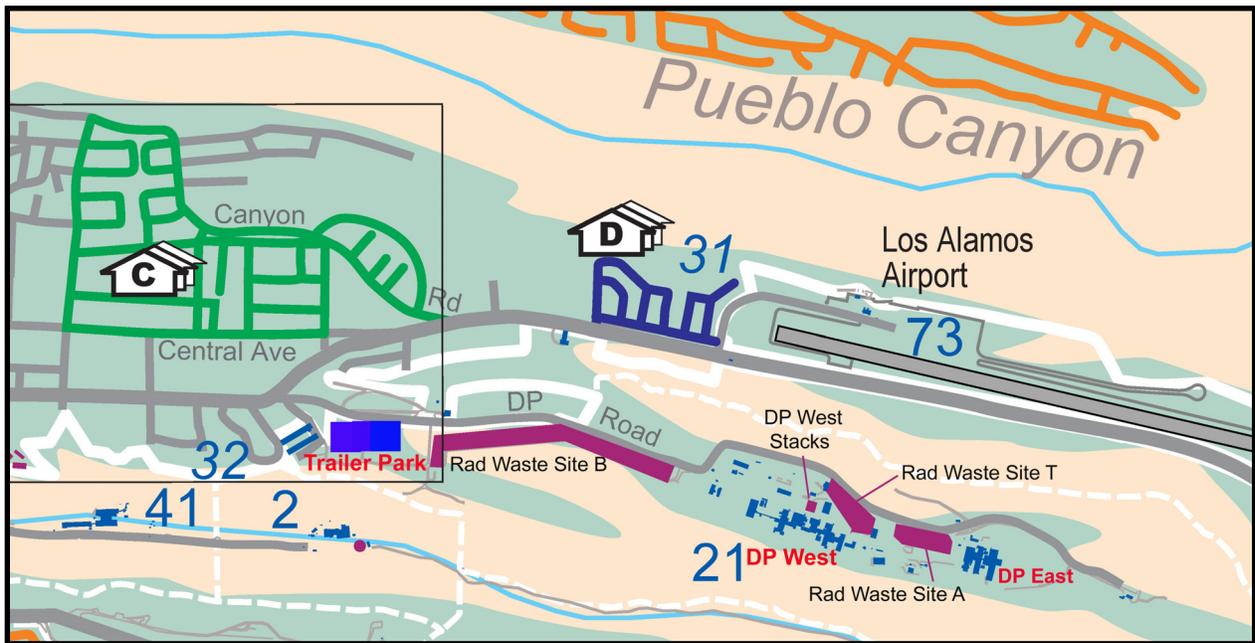


Figure 15-6: Location of DP Site relative to LANL housing areas. Group 18 housing west of the airport (housing symbol D) was established 1957-1958. Replacement housing (symbol C, established 1953-57) took the place of wartime and early postwar housing (See Figure 6-1), of which the closest to DP Site would have been the trailer park south of DP Road. Map is based on the LAHDRA Project Reference Map produced by cARTography by Andrea Kron. Data source: LANL GISLab.

c. DP East (TA-21; with releases from Buildings 152 and 153)

DP East started up in 1945 and processed polonium and actinium and to produce initiators. Building 153 served as the exhaust building for DP East until it shut down in 1970. A public area for consideration in relation to DP East operations is Group 18 Housing by the airport (see Figures 15-6 and 15-7). These homes were 0.5 to 0.75 miles northwest of DP East, and the wind blew in their direction approximately 3.7% of the time. Before the housing by the airport was established, Wartime and Early Postwar Housing, and Replacement Housing would be areas for consideration. The trailer park south of DP Road was approximately 0.9-mile WNW of DP East, and the wind blows in that direction 3.4% of the time.

d. Omega Site Reactors

Omega Site was established in 1943 and has housed three different reactors: the Water Boilers (three versions), the Plutonium Fast Reactor, and the Omega West Reactor. Due to the perceived danger of the work to be performed, Omega Site was built at the bottom of Los Alamos Canyon away from the original Technical Area (Hunner 2004; SWEIS 1998). Initially, a flexible off-gas line carried reactor effluents from the bottom of the canyon to the top of South Mesa for discharge (LAMD-155 1947). In later years, a more conventional stack was built on top of South Mesa. Royal Crest Trailer Park, which sits on South Mesa 0.25 miles south of Omega Site, and the trailer park just south of DP Road, which from around 1948 through 1963 was situated on Los Alamos Mesa directly above Omega Site, are potential public areas of consideration for the Omega Site releases (see Figures 15-8 and 15-9).

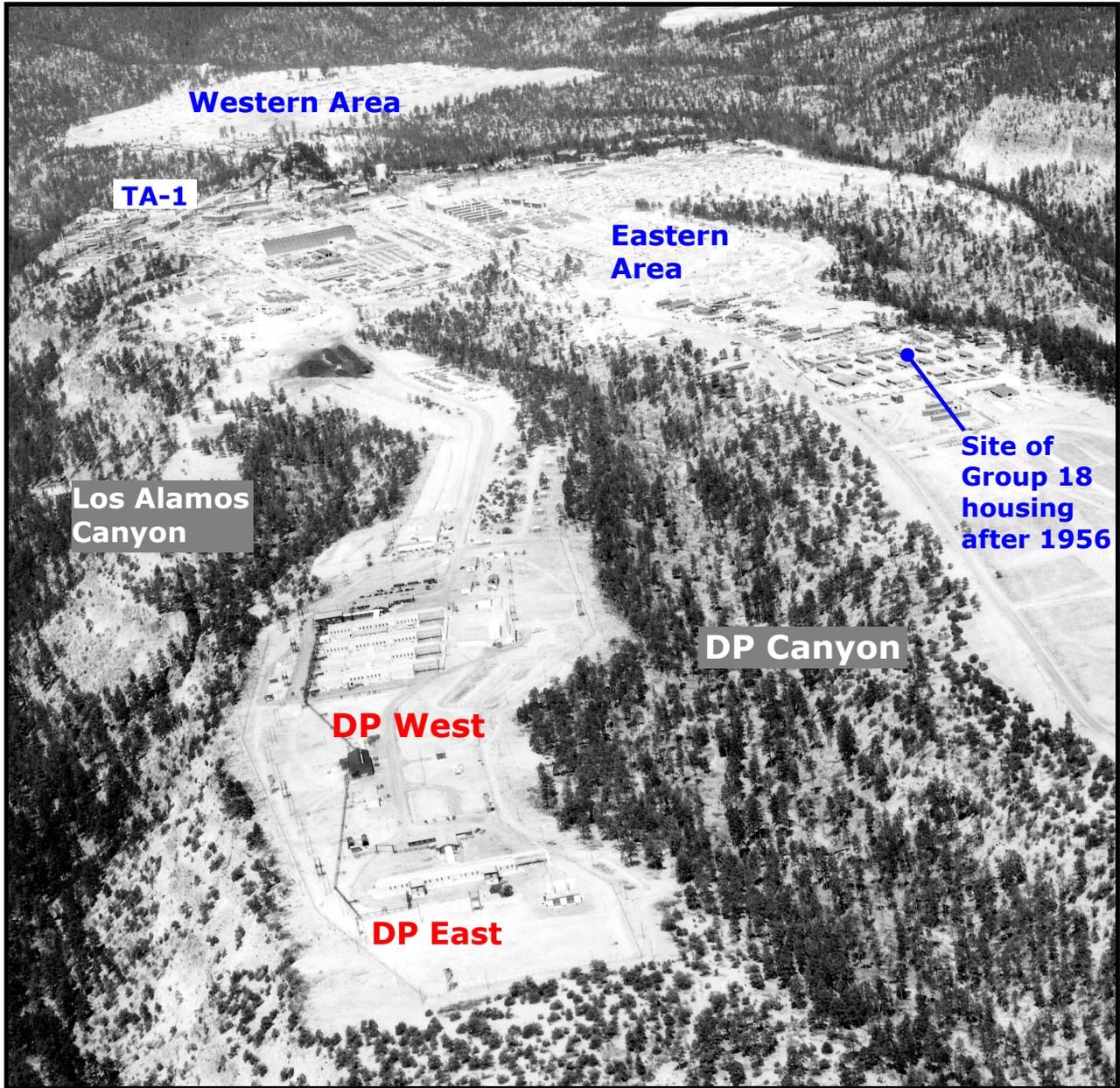


Figure 15-7: Aerial view of Los Alamos (circa 1947, looking west) shows DP East (lower center), DP West above it, and Los Alamos townsite in the background. Residential area shown include Western Area at the upper left, Eastern Area in the upper center, and the area west of (above) the airport that became the site of Group 18 housing at the upper right. *Photo courtesy Los Alamos Historical Society (LAHM-P1990-40-1-3114).*

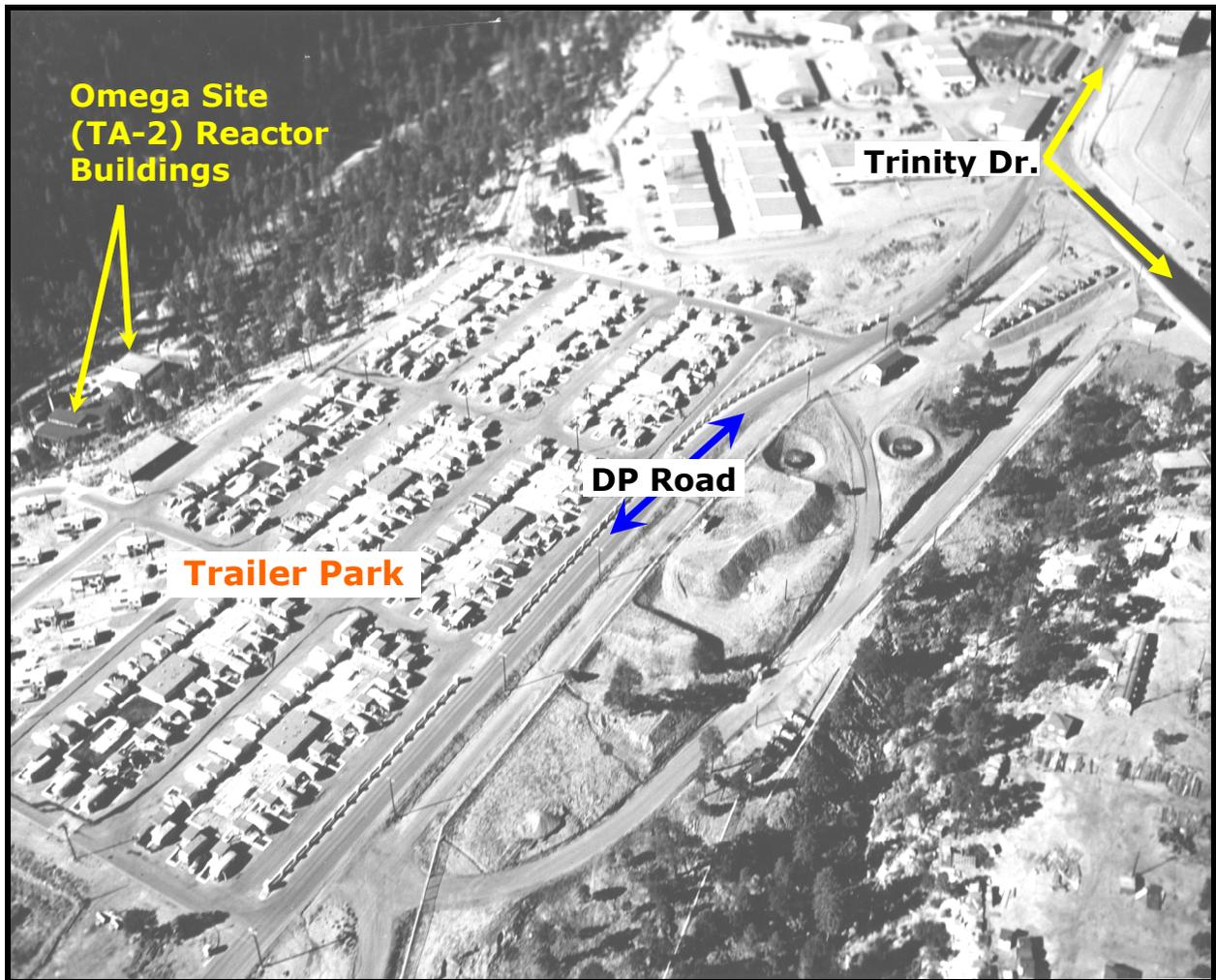


Figure 15-8: This 1949 photo shows a mobile home park located south of DP Road close to Trinity Drive. Located directly above the Omega Site reactor buildings in Los Alamos Canyon (upper left corner), the park included both private mobile homes and Wingfoot trailers supplied by the government. This area eventually became known as Royal Crest park. By August 30, 1963 all occupants were required to move out; some relocated to the “new” Royal Crest trailer park on East Jemez Road (Los Alamos Monitor 8/23/63). West of (above) the park are Zia Company warehouses and service buildings that supported TA-1. *Photo courtesy Los Alamos Historical Society (LAHM-P1989-13-1-1917).*

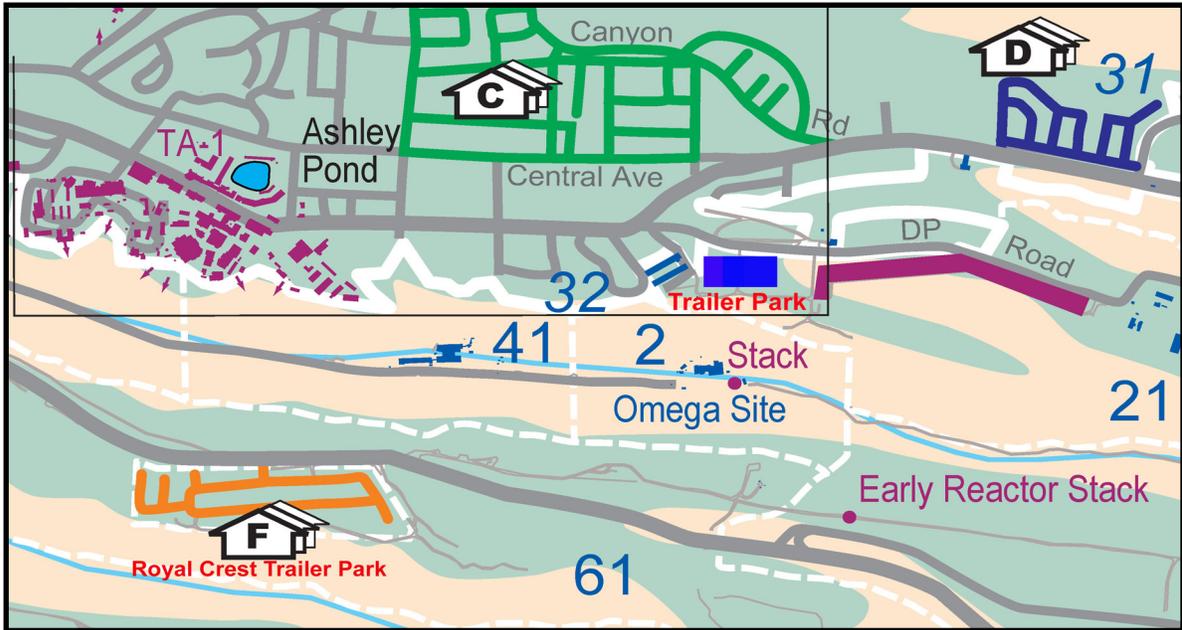


Figure 15-9: Location of Omega Site and associated reactor stacks relative to several Los Alamos housing areas. The trailer park south of DP Road was established around 1948 and was in use through at least 1963 but gone by 1979. Royal Crest Trailer Park was established in 1960, and remains in use. Reactors operated at Omega Site until 1992. Map is based on the LAHDRA Project Reference Map produced by cARTography by Andrea Kron. Data source: LANL GISLab.

e. TA-3, the current main Technical Area.

In 1953, Los Alamos National Laboratory's (LANL) main technical facilities moved from TA-1, across Los Alamos Canyon, to TA-3. Various buildings at TA-3 have housed plutonium, uranium, machining, and accelerator operations over the years. An area of interest for releases from TA-3 is the Western Area, which is located 0.5 to 1 mile north of the center of TA-3 (see Figures 15-10 and 15-11). LANL winds blow toward the north 8.8% of the time. Other possible housing areas to consider with respect to TA-3 are Replacement Housing, of which construction began in 1953, and Royal Crest Trailer Park, which opened in 1960. The closest Replacement Housing to TA-3, which is approximately 0.5 miles northeast of TA-3, lies south of Trinity Drive and east of Diamond Drive. Winds blow in the northeast direction 7.7% of the time as averaged over a 10 year period. Winds blow toward Royal Crest Trailer Park about 11.4% of the time.

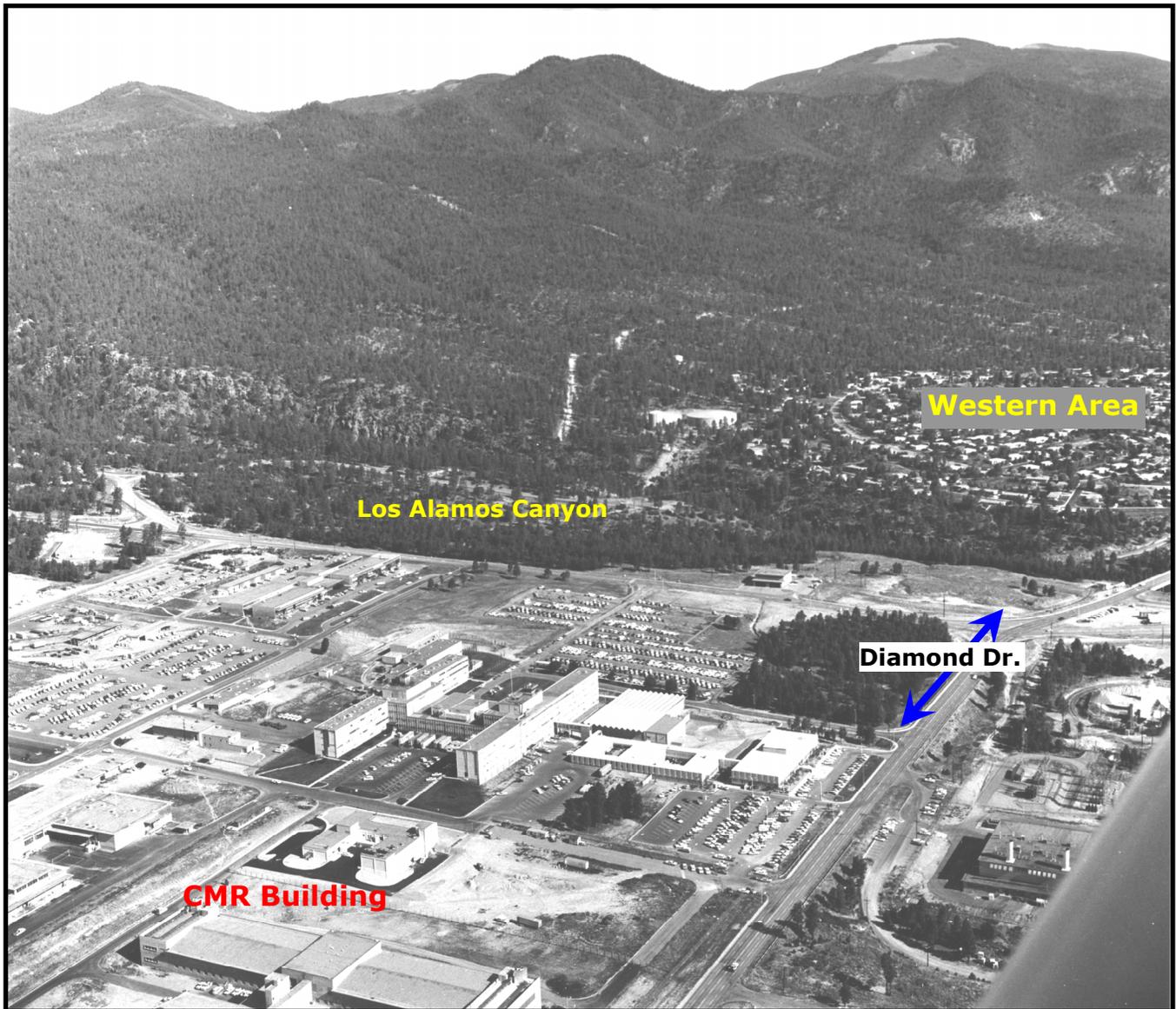


Figure 15-10: This aerial photo (circa 1967) looks across TA-3 and Los Alamos Canyon to Western Area and the Jemez Mountains. The “H”-shaped LASL Administration Building and surrounding structures are in the foreground, Diamond Drive runs through the lower right quadrant of the frame, and part of the CMR Building is visible at the lower left edge. *Photo courtesy Los Alamos Historical Society (LAHM-P2000-2-1-7144).*

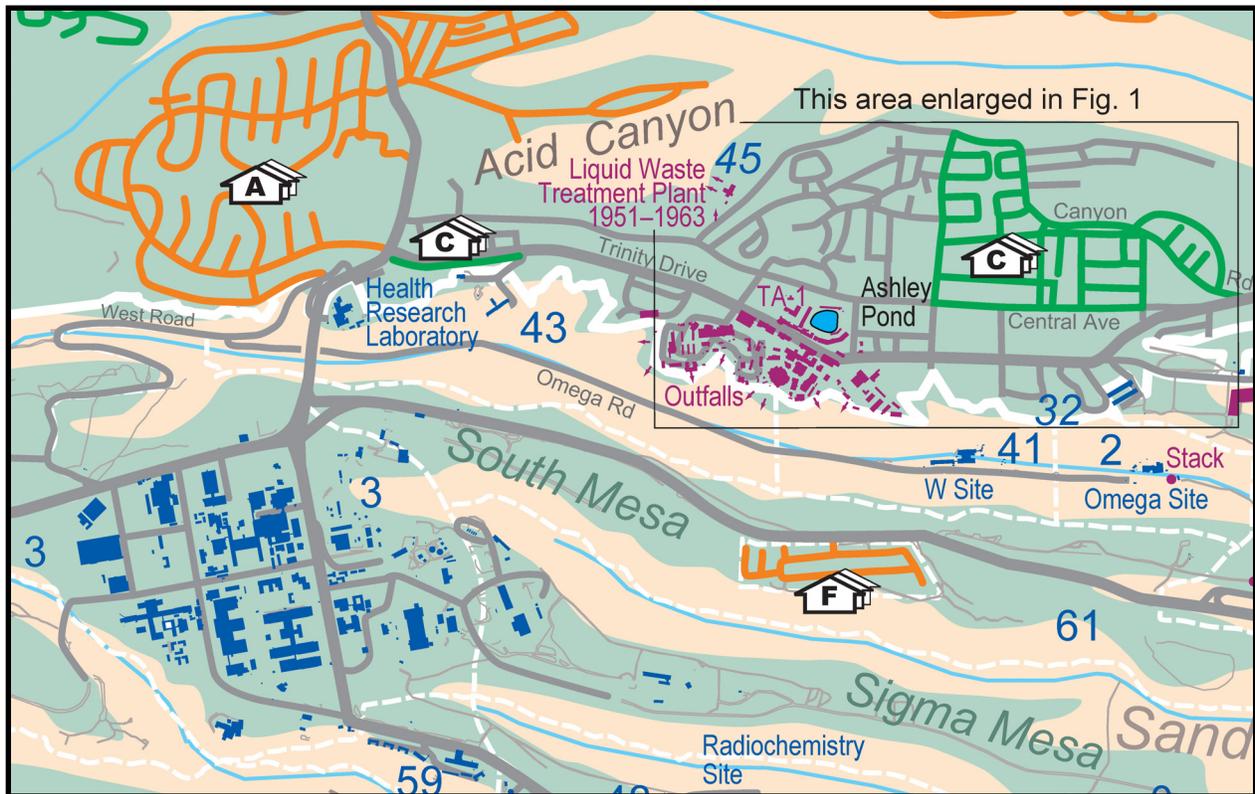


Fig. 15-11: Location of Technical Area 3 (lower left, established 1953) to some Los Alamos housing areas. Western Area (housing symbol A) was established in 1946, "replacement housing" (symbol C) was constructed 1953-1957, and Royal Crest Trailer Park opened in 1960. Map is based on the LAHDRA Project Reference Map produced by cARTography by Andrea Kron. Data source: LANL GISLab.

f. LAMPF (now LANSCE)

LAMPF (Los Alamos Meson Physics Facility), which is now called LANSCE (Los Alamos Neutron Science Center), is a large accelerator complex located on Mesita de Los Alamos (Figure 15-12). Construction began in 1968 and the facility remains in operation today. The location of the off-site maximally exposed (hypothetical) individual in LANL's annual environmental radiological dose assessments has typically been at the East Gate/Philomena's area on State Road 502 where it enters the east side of Los Alamos County (LANL 2001). This is because of the area's proximity to LANSCE, which is reflected in Figure 15-13. Philomena's restaurant was once located 0.5-mile north-northeast of the center of the LANSCE complex. According to the 10 year average wind rose, the LANL winds blow in this direction 8.3% of the time.



Figure 15-12: Aerial view of LANSCE looking towards the southwest. *Photo courtesy of LANL.*

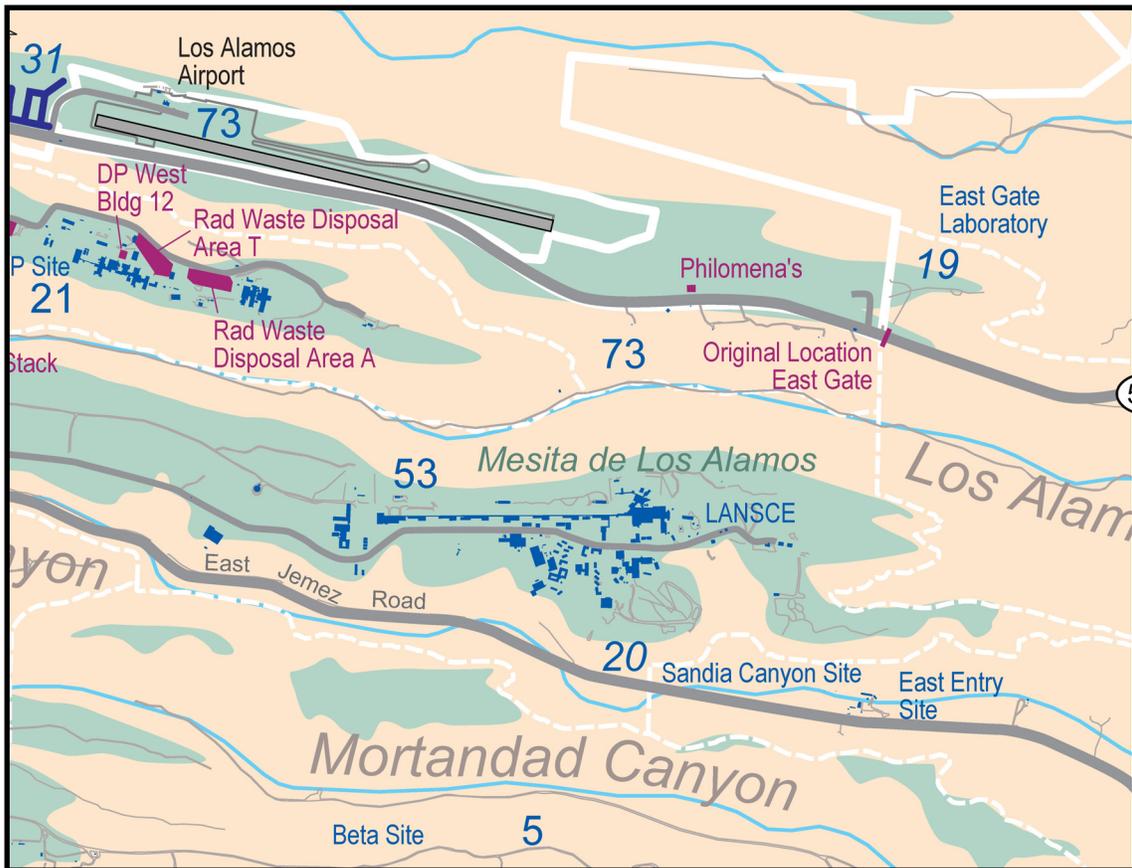


Figure 15-13: Location of LANSCE relative to several public areas near LANL. *Map is based on the LAHDRA Project Reference Map produced by cARTography by Andrea Kron. Data source: LANL GISLab.*

g. High explosives manufacturing areas

Research, development, and testing of high explosives were conducted in over 25 different Technical Areas of LANL since the 1940s. The S-Site was chosen as the high explosive manufacturing area example for the purposes of this report because it was the main site of early explosives processing facilities. S-Site (Figure 15-14) was developed for the production of high explosives in 1943 and continues in operation today. A public area of interest for the S-Site is the Western Area, which is located 2.75 miles north northeast of this site (see Figure 15-15). The winds blow from the S-Site and in the direction of the Western Area 8.3% of the time. Other areas to consider with regards to the S-Site are Wartime Housing, Replacement Housing, and Early Postwar Housing, all which were located approximately 3 miles from S-Site and experienced winds in their direction about 8% of the time.

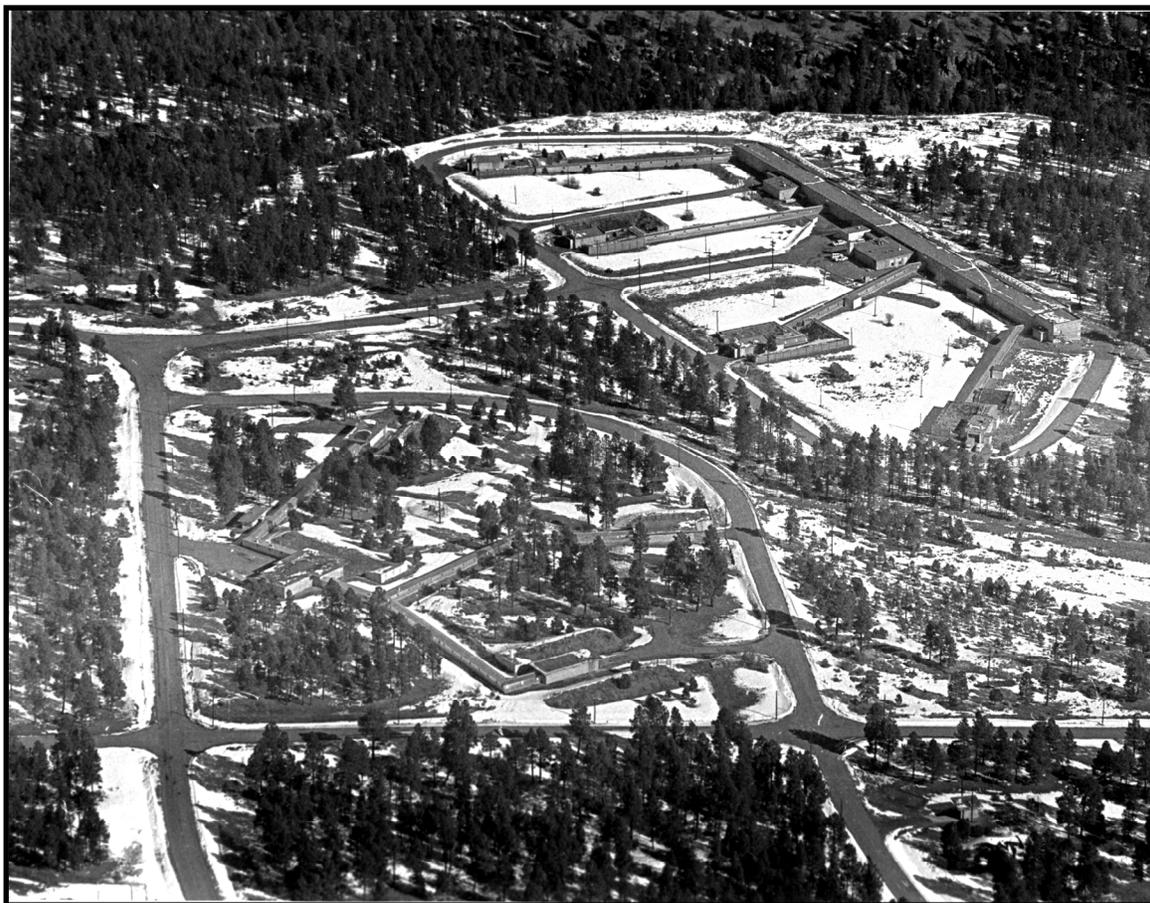


Figure 15-14: High explosives manufacturing facilities were constructed in areas more distant from residential areas than original Technical Area buildings, and wider separation between buildings reflected the more readily recognized safety hazards of associated operations. This August 1952 aerial view of TA-16 shows Building 260 in the upper right of the image. These buildings for machining high explosives were made of concrete and had special walls in the back that were built to blow out in the event of an accident. The image shows forested land above and below TA-16. *Photo courtesy Los Alamos Historical Society (LAHM-P1990-40-3138).*

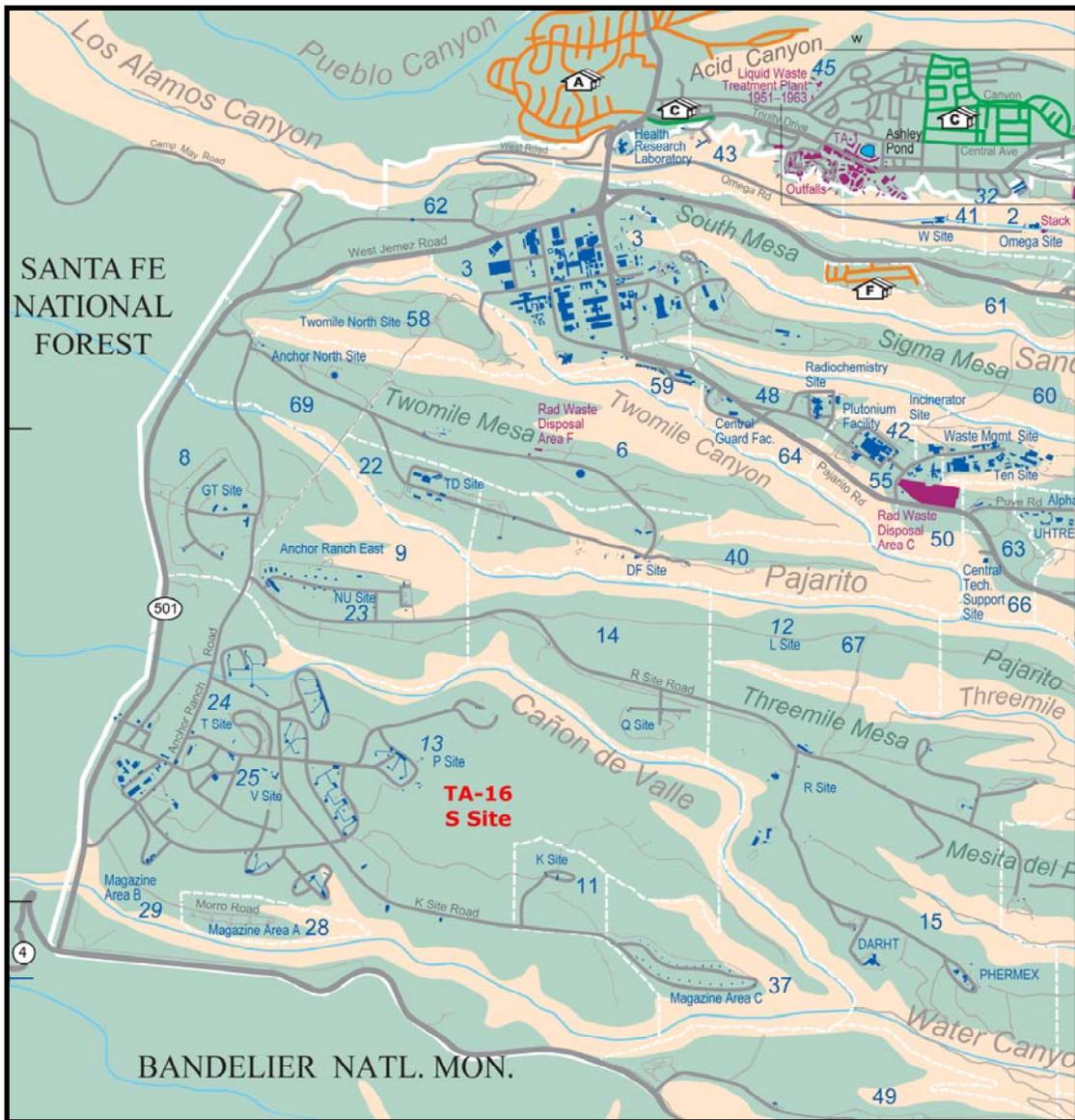


Fig. 15-15: Location of TA-16 (S Site) relative to public areas of Los Alamos. Map is based on the LAHDRA Project Reference Map produced by cARTography by Andrea Kron. Data source: LANL GISLab.

h. High Explosives firing sites

There have been a number of high explosive firing sites at LANL. R-Site was chosen as the example for the purposes of this report. Eight firing sites (A-H) were established at R-Site between 1944 and 1948, and operations at R-Site continue today. Royal Crest Trailer Park, which is located 2 miles north-northeast of the site, is the closest public area to R-Site and is an area of interest (see Figure 15-16). According to the LANL wind data, winds blow from R-Site towards the trailer park 8.3% of the time. Since R-Site began operations in 1944, earlier housing should also be considered when evaluating R-Site releases. Wartime Housing, Early Postwar Housing, and Replacement Housing were all about 2.5 miles to the north, north-northeast, and north-northeast, respectively. Winds blow in these directions 8% to 9% of the time.



Fig. 15-16: Location of TA-15 (R Site) relative to public areas of Los Alamos. Map is based on the LAHDRA Project Reference Map produced by cARTography by Andrea Kron. Data source: LANL GISLab.

i. Bayo Canyon firing site

The Bayo Canyon Site (TA-10) was used between 1944 and 1962 for experiments using conventional high explosives, radioactive lanthanum (RaLa), and in some cases depleted or natural uranium. Its location is shown in Figure 15-17. A public area of interest for the Bayo Canyon site is the Totavi Camp, located 5 miles east-southeast of the site down the Bayo Canyon. Since operations at this site were conducted in a canyon that runs approximately east to west, wind tends to blow back and forth down this canyon. The Totavi Camp was located east south east of the Bayo Canyon site and wind travels in this direction 11.9% of the time. Also of interest due to the canyon winds is the North Community, which is located 2.5 miles directly west of the Bayo Canyon site. Winds blow in the direction of the North Community 3.5% of the time.

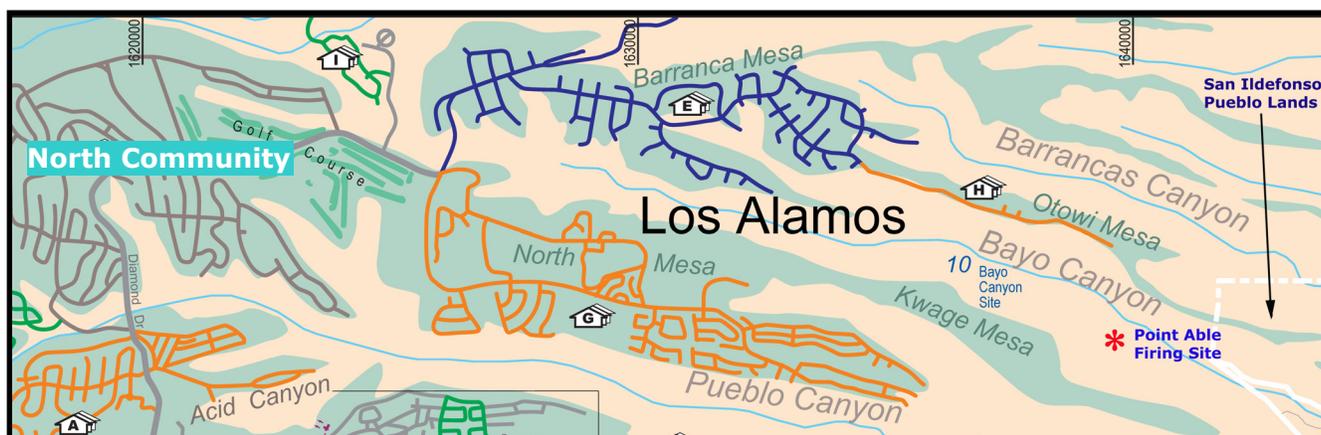


Figure 15-17: Location of Point Able site that was the location of many RaLa shots between 1944 and 1962. The North Community (established in 1948) is at the left of the figure (labeled with housing symbol B) and San Ildefonso Pueblo lands are east of the LANL boundary at the lower right. Areas associated with housing symbols A, E, G, and H indicate residential areas that were established in 1946, 1958, 1977, and the late 1970s, respectively. Map is based on the LAHDRA Project Reference Map produced by cARTography by Andrea Kron. Data source: LANL GISLab.

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